

IBM Maintenance Library

PANEL DEV-I ACC R/W	HDA RPI PWR LOC INST	INDEX MLX LGND START FSI MSG SENSE OPER	MICRO	MICFL
VOL. R05	VOL. R06	VOL. R07	VOL. R08	VOL. R09

Every Satellite Module on the 3340 subsystem (including the 3344) has its own Volumes R05 and R06.

The 3344 MLM also includes Volumes R07, R08, and R09. See the *START* section in Volume R07 for details.

3344 Disk Storage Maintenance Information

3344

LA0000
Seq. 1 of 2

2359023
Part No.

441235
28 May 76

MAINTENANCE LIBRARY MANUAL
ORDERING PROCEDURE (IBM Internal)

Individual pages of the 3344 Maintenance Library Manual can be ordered from the San Jose plant by using the Wiring Diagram/Logic Page Request (Order No. 120-1679). In the columns headed "Logic Page" enter the page identifier information: sequence number, sheet number, part number, and EC number. Groups of pages can be ordered by including a description (section, volume, etc.) and the machine serial number.

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3344

LA0000	2359023	441235				
Seq. 2 of 2	Part No.	28 May 76				

CE SAFETY PRACTICES

All Customer Engineers are expected to take every safety precaution possible and observe the following safety practices while maintaining IBM equipment:

1. You should not work alone under hazardous conditions or around equipment with dangerous voltage. Always advise your manager if you MUST work alone.
2. Remove all power, ac and dc, when removing or assembling major components, working in immediate areas of power supplies, performing mechanical inspection of power supplies, or installing changes in machine circuitry.
3. After turning off wall box power switch, lock it in the Off position or tag it with a "Do Not Operate" tag, Form 229-1266. Pull power supply cord whenever possible.
4. When it is absolutely necessary to work on equipment having exposed operating mechanical parts or exposed live electrical circuitry anywhere in the machine, observe the following precautions:
 - a. Another person familiar with power off controls must be in immediate vicinity.
 - b. Do not wear rings, wrist watches, chains, bracelets, or metal cuff links.
 - c. Use only insulated pliers and screwdrivers.
 - d. Keep one hand in pocket.
 - e. When using test instruments, be certain that controls are set correctly and that insulated probes of proper capacity are used.
 - f. Avoid contacting ground potential (metal floor strips, machine frames, etc.). Use suitable rubber mats, purchased locally if necessary.
5. Wear safety glasses when:
 - a. Using a hammer to drive pins, riveting, staking, etc.
 - b. Power or hand drilling, reaming, grinding, etc.
 - c. Using spring hooks, attaching springs.
 - d. Soldering, wire cutting, removing steel bands.
 - e. Cleaning parts with solvents, sprays, cleaners, chemicals, etc.
 - f. Performing any other work that may be hazardous to your eyes. REMEMBER — THEY ARE YOUR EYES.
6. Follow special safety instructions when performing specialized tasks, such as handling cathode ray tubes and extremely high voltages. These instructions are outlined in CEMs and the safety portion of the maintenance manuals.
7. Do not use solvents, chemicals, greases, or oils that have not been approved by IBM.
8. Avoid using tools or test equipment that have not been approved by IBM.
9. Replace worn or broken tools and test equipment.
10. Lift by standing or pushing up with stronger leg muscles — this takes strain off back muscles. Do not lift any equipment or parts weighing over 60 pounds.
11. After maintenance, restore all safety devices, such as guards, shields, signs, and grounding wires.
12. Each Customer Engineer is responsible to be certain that no action on his part renders products unsafe or exposes customer personnel to hazards.
13. Place removed machine covers in a safe out-of-the-way place where no one can trip over them.
14. Ensure that all machine covers are in place before returning machine to customer.
15. Always place CE tool kit away from walk areas where no one can trip over it; for example, under desk or table.

16. Avoid touching moving mechanical parts when lubricating, checking for play, etc.
17. When using stroboscope, do not touch ANYTHING — it may be moving.
18. Avoid wearing loose clothing that may be caught in machinery. Shirt sleeves must be left buttoned or rolled above the elbow.
19. Ties must be tucked in shirt or have a tie clasp (preferably nonconductive) approximately 3 inches from end. Tie chains are not recommended.
20. Before starting equipment, make certain fellow CEs and customer personnel are not in a hazardous position.
21. Maintain good housekeeping in area of machine while performing and after completing maintenance.

Knowing safety rules is not enough.
An unsafe act will inevitably lead to an accident.
Use good judgment - eliminate unsafe acts.

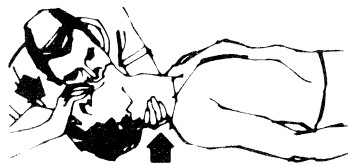
ARTIFICIAL RESPIRATION

General Considerations

1. Start Immediately — Seconds Count
Do not move victim unless absolutely necessary to remove from danger. Do not wait or look for help or stop to loosen clothing, warm the victim, or apply stimulants.
2. Check Mouth for Obstructions
Remove foreign objects.
3. After victim is breathing by himself or when help is available:
 - a. Loosen clothing.
 - b. Place victim on his side.
 - c. Keep victim warm.
4. Remain in Position
After victim revives, be ready to resume respiration if necessary.
5. Call a Doctor
Have someone summon medical aid.
6. Don't Give Up
Continue without interruption until victim is breathing without help or is certainly dead.

Rescue Breathing for Adults

1. Place victim on back; lift neck and tilt head way back. (Quickly remove any noticeable food or objects from mouth.)
2. Pinch nose closed; make airtight seal around victim's mouth with your mouth; and forcefully breathe into victim until chest rises (expands).



3. Continue breathing for the victim 12 times per minute WITHOUT STOPPING.
4. If chest does not rise (expand), roll victim onto side and pound firmly between shoulder blades to remove blocking material. Also, try lifting jaw higher with your fingers. Resume rescue breathing.

MICRODIAGNOSTIC INSTRUCTIONS (General)

Disk Loading MICRO 8
Diagnostic Rate Selector MICRO 8
Operating Instructions MICRO 10
Displaying Error/Messages MICRO 12

REFERENCES TO OTHER SECTIONS

Microdiagnostic Flowcharts MICFL Section
Sense Data Summary SENSE Section
Tag Summary OPER 98 101

ROUTINE RUNNING INSTRUCTIONS

Routines A0, A1, A2 MICRO 20
Routines A5, A7, A9 MICRO 24
Routines AA, AB MICRO 28
Routines AD, AE MICRO 30
Routine AF MICRO 32
Routine B0. MICRO 52
Routine B1. MICRO 56
Routine B2. MICRO 60
Routine B3. MICRO 64
Routine B4. MICRO 68
Routine B6. MICRO 70
Routine B8. MICRO 72
Routine B9, BA MICRO 76
Routine BD MICRO 84
Routine BF MICRO 84
 (This routine applies only to
 System/370, Models 115,
 125 and 4331)
Routine HC MICRO 84

ERROR CODE DICTIONARY

Routines A0 through AF MICRO 89-824
Routines B0 through BF MICRO 840-1435

3830-2 STORAGE CONTROL

- 1. At the 23FD Drive, replace the 3830-2 microprogram disk with the correct 3344 microdiagnostic disk.
- 2. Programs can now be run from the 3340 CE Panel. If problems are found while doing Step 1, refer to the 3830-2 MLM. It is not unusual for the Check 2 lamp on the 3830-2 CE Panel to turn on while maintenance programs are running.

Caution: Return the Functional Program disk to the 23FD before returning the 3344 to the customer. Reload the Fault Symptom Code (FSC) generator into the Storage Control overlay area by executing the '30' option (see START 500).

INTEGRATED STORAGE CONTROL

- 1. At the ISC 23FD Drive, replace the ISC disk with the 3344 microdiagnostic disk.
- 2. Programs can now be run from the 3340 CE Panel. If problems are found while doing Step 1, refer to the ISC MLM. It is not unusual for the Check 2 lamp on the ISC CE Panel to turn on while maintenance programs are running.

Caution: Return the Functional Program disk to the 23FD before returning the 3344 to the customer. Reload the Fault Symptom Code (FSC) generator into the Storage Control overlay area by executing the '30' option (see START 500).

3880 Storage Control

Ensure that the diskette containing the 3344 Microdiagnostics is installed in the 3880. 3344 microdiagnostics can be run from the 3340 CE Panel as described on MICRO 10.

Caution: Reset diagnostic control with '30' run option (see START 500) after maintenance activity is complete.

SYSTEM/3 DSA

Refer to the System/3 Diagnostic Users Guide for microdiagnostic loading instructions.

SYSTEM/370 MODELS 125, 115 AND 4331 PROCESSOR

- 1. Load the System disk in the System/370 Console Disk File. This disk is normally loaded for customer operations. It contains the 3340/3344 microdiagnostic routines (ILTs).
- 2. Load a 3340/3344 microdiagnostic routine. Refer to the System/370 Model 125 or 115 CTM or MLM (MLX Entry 11) for loading instructions. For 4331 refer to STM for loading instructions.

Note: The first 3340/3344 microdiagnostic routine must be loaded from the SVP console keyboard. Once the first routine has been loaded, program execution for it or subsequent routines may be controlled from either the SVP console or the 3340 CE Panel. After the first routine is loaded, it is not necessary to load subsequent routines from the SVP console; the 3340 CE Panel may be used. Microtesting is terminated by a '30' run option entry (see Maintenance Complete Procedure, START 500). After the '30' run option has been used, it is necessary to restart from the SVP console.

- 3. Return to the 3340 maintenance procedures after loading the initial routine.

Caution: Reset diagnostic control with the '30' run option (see START 500) after the maintenance activity is complete.

MICRODIAGNOSTIC RATE SELECTOR 3830 AND ISC

Purpose

The storage control microdiagnostics provide a variable run rate for drive microdiagnostics during concurrent maintenance. A run rate may be selected that is most compatible with the customer needs. For example, if microdiagnostics cause system degradation to the degree of impacting customer operation, the microdiagnostic rate may be reduced to minimize degradation. However, if it is desired to reduce the drive down time, an increased microdiagnostic rate may be selected.

Caution must be exercised when selecting a faster rate. Unless an alternate path is available to the string of drives, a faster rate will probably impact customer operation.

Note: The rate selection has no effect on stand-alone run times.

Theory

System utilization of the storage control directly affects the run rate of microdiagnostics. Regardless of the rate selected, if the system has not attempted to select the storage control while microdiagnostics are being run, the diagnostic monitor proceeds immediately into the next diagnostic routine. If however, the system attempts to select the storage control while microdiagnostics are being run, the storage control forces a specified amount of time for system utilization.

Operation

The range of run rates are from approximately 1.5 minutes to several hours (depending on system utilization) to run the linked series. The customer should be consulted before deciding to either increase or reduce the microdiagnostic rate. The customer should be made aware that a faster rate could degrade system performance (depending upon utilization) and reduce downtime. Also, a slower rate, while lessening the impact the microdiagnostics have on system performance, may increase the downtime.

For complete operating instructions, see the 3830-2 or ISC MLM (MICRO section).

MICRODIAGNOSTIC ROUTINES

- A0 CE Panel Test
 - A1 Control Interface and Logic Tests
 - A2 Drive Interface and Logic Tests
 - A5 Drive Index and Sector Tests
 - A7 Dynamic Servo Adjustment Routine
 - A9 Incremental Seek Tests
 - AA Cylinder Seek Tests
 - AB Random Seek Tests
 - AD Gap Counter and Data Transfer Tests
 - AE ECC Logic Tests
 - AF Format Read/Write Tests
 - *B0 Reformat CE Tracks Utility Routine
 - *B1 Read Tests
 - *B2 Write Tests
 - *B3 Device Status Display Utility Routine
 - *B4 Tag Cycle Utility Routine
 - B6 String Switch Tests
 - B8 HDA/Control Logic Tests
 - B9 Dynamic Servo Tests
 - BA HDA State Analysis Tests
 - BD Vibration Tolerance Tests
 - *BF Control Interface Bringup Routine for System/370, Models 115 and 125
 - *HC Control Interface Bringup Routine 3830-2 and ISC.
- Linked Series:
A1, A2, B8, A5, AD, AF, B9, AE
- * Utility Routines

Microdiagnostic Error Code Format

The microdiagnostic Error Code format follows the pattern below, except where noted in the Error Code Dictionary.

Example:

AF85 AF = routine number
 8 = test number
 5 = error number

LC0008	2359397	441235	441237	441239	441240	441241
Seq. 1 of 2	Part No.	28 May 76	1 Mar 77	15 Jun 79	30 May 80	29 Aug 80

LOADING PROCEDURES
(From 3340 CE Panel)

Preliminary

The microdiagnostics can be used only if the functional microcode is in the storage control. If the system has been in use, the code will be loaded. If this is not the case, load (IMPL) the functional microprogram.

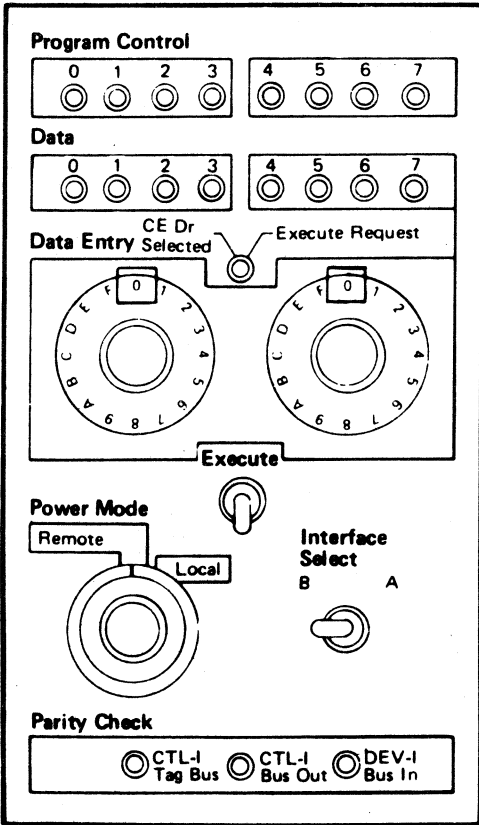
For storage control requirements or references to storage control documentation for system requirements, see MICRO 8.

The recommended microdiagnostic running sequence for general checkout is shown on START 110. Follow the MAP instructions for other maintenance operations.

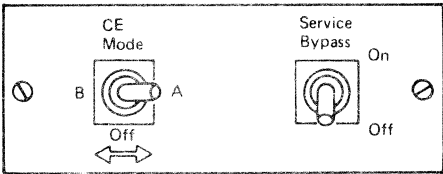
Procedure

This procedure outlines operations at the CE Panel on the 3340 A2 Module.

Note: If correct results are not obtained when running the microdiagnostics, recheck all previous steps. See PANEL 150, Entry A of the 3340 MLM if the controls do not work correctly.

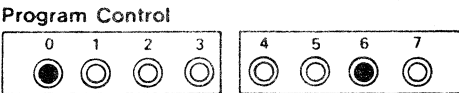


- 1 Turn on the CE Mode switch for the drive to be tested (A or B). The CE Mode latch (set by the CE Mode switch) must be reset after the microdiagnostics are run. See the Note on START 500.



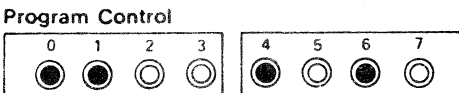
- 2 Set Data Entry switches to the required routine number. (The running descriptions start on MICRO 20.)
- 3 Operate the Execute switch. The routine designated by the Data Entry switches is loaded from the microdiagnostic disk.

82 DIAGNOSTIC LOADING



The display of '82' may occur too quickly to be seen.

CA READY FOR EXECUTION



The diagnostic is loaded. The routine number is shown in the Data display.

Is 'CA' and correct routine number displayed?

NO YES → Proceed to Step 4

UNABLE TO LOAD ROUTINE

Check Program Control display. (See MICRO 11 for a summary.) If unable to solve problem, turn to Panel Checkout Procedure on PANEL 150, Entry A.

- 4 Are parameters required (addresses, test loops, etc.)?

NO YES

Are run options required (dynamic error display, loop routines, etc.)?

NO YES

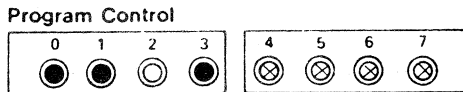
- 5 Set Data Entry switches to '00'.

ENTER PARAMETERS

Parameters are entered to loop tests for scoping or to define seek addresses, etc. The microdiagnostic descriptions (MICRO 20 through 84) specify the available parameters.

- A. Set '10' in the Data Entry switches.
- B. Operate the Execute switch.

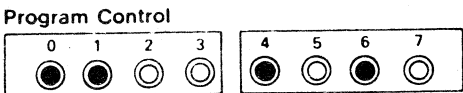
Dx STORAGE CONTROL READY TO ACCEPT PARAMETERS



Program Control bits 4 through 7 indicate the parameter byte number needed.

- C. Set Data Entry switches to the parameter value for the byte number indication display bits 4 through 7 ('1' through 'F'). See MICRO 20 through 84 for the required parameter values.
- D. Operate the Execute switch.
- E. If program control display = 'CA', proceed to step F, otherwise more parameters are required. Return to step C.

CA DIAGNOSTIC READY FOR EXECUTION



All parameters, as specified in the routine descriptions (MICRO 20) must be entered.

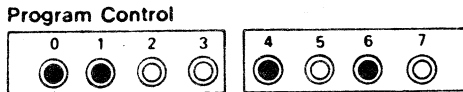
- F. If run options (for dynamic error display, etc.) are required, go to Select Run Options, otherwise, return to Step 5.

SELECT RUN OPTIONS

Run options may be selected at any time except when parameters are being entered. Options are reset if a new routine is loaded.

- A. Set Data Entry switches for the desired run option.
- B. Operate the Execute switch.

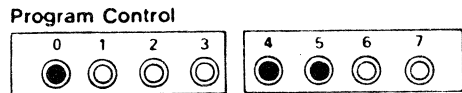
CA DIAGNOSTIC READY FOR EXECUTION



Return to Step 5.

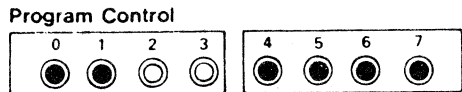
- 6 Operate the Execute switch to start microdiagnostic.

8C MICRODIAGNOSTIC RUNNING

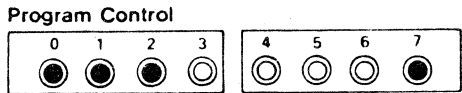


Routine number is in the Data display.

CF NORMAL COMPLETION



E1 ERROR OCCURRED or MESSAGE AVAILABLE



To determine error code or to display messages, see MICRO 12.

- 7 Refer to START 500 for procedures to return device to an online status after running the microdiagnostics.

RUN OPTIONS

Data Entry Switches (Hex)	Description
01	Dynamic error display, repeat test after error. Can be used when looping tests (parameter entry).
02	Loop routine. All routines linked to looped routine also run. See descriptions (MICRO 20) for linking information.
03	Dynamic error display and loop routine (including linking routines).
04	Inhibit routine linking. See descriptions (MICRO 20 through 84) for linking information.
05	Inhibit routine linking, dynamic error display. Repeat test after error.
06	Loop single routine (inhibit linking).
07	Loop single routine (inhibit linking) and dynamic error display.
08	Reset run options (allows linking, no looping, and error stops as if no run options were selected).
Bit significance of run option entry: 0 1 2 3 4 5 6 7	
└─ Dynamic error display (repeat test after error)	
└─ Loop routine	
└─ Inhibit linking (4)	
└─ Reset run options	

Program Control

0123

4567

Data

0123

4567

CE Dr
Data Entry Selected

Execute Request

0123456789

0123456789

Execute

Power Mode

RemoteLocal

Interface Select

B

A

Parity Check

CTL-4 Tag Bus

CTL-1 Bus Out

DEV-1 Bus In

Program Control Display (Hex)	Description	Data Display
82	The routine specified in the Data Entry switches is now loading.	Routine Number
8C	The microdiagnostic is running.	Routine Number
8D	Dynamic error display. Errors are displayed as they occur, but execution is not stopped because of the dynamic error display run option.	Error Number
C0	An invalid routine number was set in the Data Entry switches, or an incorrect microdiagnostic disk is installed.	Routine Number
	The routine execution was interrupted by a system or selective reset. Restart the microprogram.	'00'
CA	Microdiagnostic (routine series, routine, or test) is ready for execution.	Routine Number
CE	Routine stopped because of: 1. Manual intervention required. 2. Error or message display complete.	Routine Number
CF	All Systems Normal end of routine or end of series of linked routines.	Routine Number
	3830-2 or ISC Only Normal end of control option '30' and Fault Symptom Code generator overlay complete.	'30'
	3880 Normal end of '30' option.	
DX	Parameter entry required. Bits 4 through 7 of Program Control display indicate parameter byte number needed.	Routine Number
E1 or EX	Error or message stop. If bits 4 through 7 of the Program Control display = '01', it indicates the first Error Message Byte is in the Data Display lamps. If control option '20' is used to display additional bytes, bits 4 through 7 of the Program Control display indicate the byte number displayed in the Data lamps.	Error Number or Message Byte
FX	An error was detected by the storage control. Verify: 1. Proper microdiagnostic disk is correctly installed. If the disk is not correct or not properly installed, reinstall the correct disk and execution will continue. 2. Disk reader door is securely closed. Refer to the storage control MLM if the correct disk is installed and an FXXX error occurs.	N/A

CONTROL OPTIONS

Data Entry Switches (Hex)	Description
00	Start/Stop Starts (or resumes) execution if the routine is stopped. Stops execution if the routine is running or if an error message display is in progress.
10	Parameter entry control (see Enter Parameters, MICRO 10).
20	Start or advance error or message display (see Display Message Bytes, MICRO 12).
30	Reset diagnostic control. If attached to S370 Models 115 or 125, or 4331 the '30' option can be entered from the 3340 CE panel. After the '30' has been read from the Data Entry switches (Execute lamp goes off), there is no further communication with the CE panel. All additional microdiagnostic information must be obtained from the console. The console must be used to run any additional microdiagnostics. If attached to a S/370 Model 135, the Program Control/Data display will be 'COxx' after completion. If attached to a 3880 Storage Control the Program Control/Data display will be 'CF30' after completion. When the storage control is a 3830-2 or ISC, control option '30' must be selected with the <i>functional</i> microprogram disk installed before returning the subsystem to the customer. The purpose is to reload the Fault Symptom Code generator into the diagnostic overlay area. If control option '30' is selected: - Program Control/Data display should then display 'CF30' to indicate reload completion. For any other display, see below. - With the microdiagnostic disk installed, a B511 error occurs, see Microdiagnostic Error Code Dictionary. - With no disk installed, an FXXX error occurs. To recover, insert the disk in the reader and execution continues. - With the correct disk installed and an FXXX error occurs, refer to the storage control documentation.

3340
10
Storage Control
MLX Chart
(See Note.)

Note: Use the 3340 entry into other MLMs.

LC0011 Seq. 1 of 2	2359398 Part No.	441235 28 May 76	441239 15 Jun 79	441240 30 May 80	441241 29 Aug 80	
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3340
10
Storage Control
MLX Chart
(See Note.)

DISPLAYING ERRORS/MESSAGES

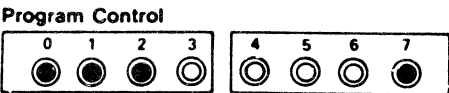
DETERMINING ERROR CODE

These procedures are for every routine except B3.

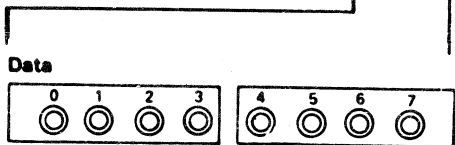
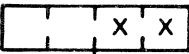
Entry into the Microdiagnostic Error Code Dictionary (MICRO 89 through 1435) is by an Error Code consisting of four hex characters. To develop the code:

When E1 is displayed in the Program Control lamps,

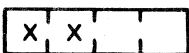
E1



The Data display lamps contain the last two hex characters of the Error Code number.



- 1 Record the Data display
- 2 Set '20' in the Data Entry switches.
- 3 Go to Display Message Bytes, then return here.
- 4 Record the routine number from the Data display. If the display is the last byte of routine B3, pass 2, this is the end of the message display. No Error Code is generated by B3, pass 2.



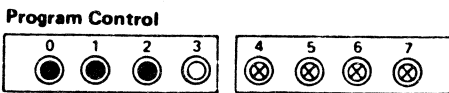
Error Code XX XX (See Note.)

First byte of Error Code is displayed on Data lamps when 'CE' is displayed in Program Control. Second byte of Error Code is displayed on Data lamps when 'E1' is displayed in Program Control.

- 5 Look up the Error Code in the Microdiagnostic Error Code Dictionary (starts on MICRO 89) to determine analysis procedure.

DISPLAY MESSAGE BYTES

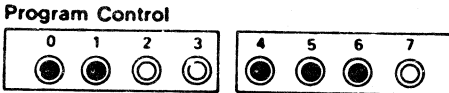
EX



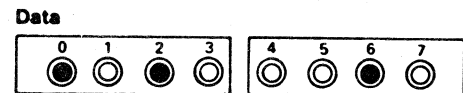
The Data display contains a Message Byte. The byte number 'x' is indicated in Bits 4 through 7 of the Program Control display.

- 1 Operate the Execute switch to display and record the next byte in the Data lamps. Bits 4 through 7 of Program Control increments by 1 to indicate byte number.
- 2 Repeat Step 1 until all Message Bytes have been recorded.

CE LAST BYTE



A2 ROUTINE A2 (Example)



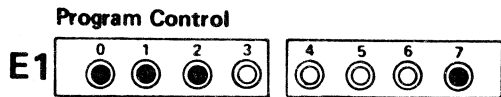
The last byte contains the routine number (for example, 'A2').

Note: The Microdiagnostic Error Code format follows the pattern below, except where noted in the Error Code Dictionary.

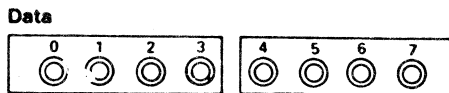
Example: AF85 AF = routine number 8 = test number 5 = error number

B3 - DETERMINE FAULT SYMPTOM CODE (FSC) FROM B3 MICRO UTILITY

Pass 1 of B3 generates an FSC for entering maintenance procedures from the Fault Symptom Index (FSI) starting at FSI 100. The results consist of a 4-hex character code. Pass 2 of B3 permits a display of the Message Bytes. For a B3 description, see MICRO 64, FSI 60, and FSI 65.

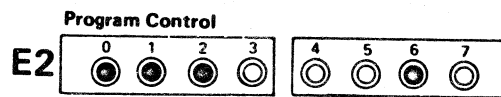


X1 X2

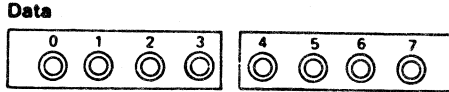


B3 is stopped and Byte 1 of FSC or Error Code is available.

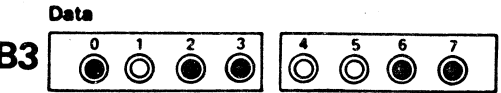
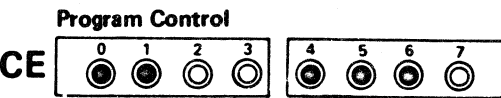
- 1 Record Data display. Use display as first two hex characters of FSC. If display is 'FF', there is no error information to generate an FSC. Continue to read out Message Bytes.
- 2 Set '20' in the Data Entry switches.
- 3 Operate the Execute switch.



X3 X4



- 4 Record Data display. Use display as last two hex characters of FSC. Disregard Steps 4 and 5 if Step 1 display was 'FF'.
- 5 Use FSC to enter maintenance procedures by going to FSI 100 and proceed until FSC is found.
- 6 Set '00' in the Data Entry switches.
- 7 Operate the Execute switch.

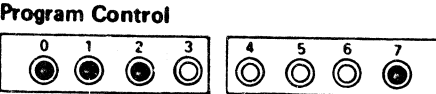


- 8 To obtain supporting Message Bytes, continue with B3, Pass 2.

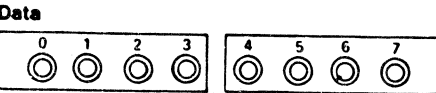
B3, PASS 2 - READING MESSAGE BYTES

- 1 Set '00' in the Data Entry switches.
- 2 Operate the Execute switch.

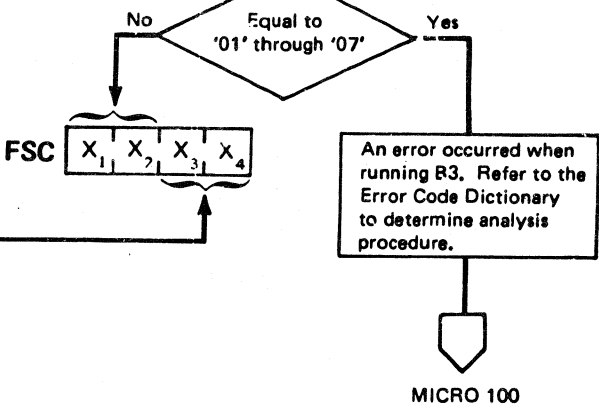
E1 MESSAGE BYTE 1 AVAILABLE IN DATA DISPLAY LAMPS



XX MESSAGE BYTE 1 (See FSI 65 for definition of Message Bytes.)



- 3 Set '20' in the Data Entry switches, and go to Display Message Bytes.



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Routine ID (Hex)	Routine Name	Test No.	Test Name	Routine Description	Parameters				Prerequisites	Reference Notes
					Byte No.	Default Value (Hex)	Value Limits (Hex)	Description		
A0	CE Panel Test	1	Single Test Routine	Routine A0 tests the following: CE Panel Data Entry switches. CE Panel lamps and registers.					The control interface must be operative to the point of loading and starting this routine.	See MICFL section for flowchart and detailed description.
A1	Control Interface and Logic Tests	1 2 3 4 5	Pre-selection Selection Controller Tag Bus, Bus Out Parity Check Valid Tags Bus In Assembler	Routine A1 tests the following: Interface lines for always active/inactive conditions. 3-of-6 code for validity on selection. Controller tag decoder for Tag Valid returned on all controller tags. The four registers in the Bus In Assembler.		00	00–05	Test Number. (Allows looping a single test within this routine.) 00 (default)=Run all tests.	Control interface must be operative to the point of loading and starting this routine.	See MICFL section for flowchart and detailed description. Drive in CE Mode and/or HDA Ready not required.
A2	Device Interface and Logic Tests	1 2 3 4 5 6 7 8 9 A B	Drive Selection Drive Tag Bus and Bus Out Parity Bus Out/Bus In Wrap Drive Selection/Rejection Drive Valid Tags Drive Invalid Tags Bus In Parity Check Head Address Register Difference Counter Part 1 Difference Counter Part 2 CAR Test	Routine A2 tests the following: The ability to select a device. Set and reset of checkers used by test. Verifies that at least one complete path exists between Bus Out and Bus In. Ensures that drive selection does not occur with Bus Out bit 4 active under Tag '83'. Tag decoders for Tag Valid returned on all device valid tags. No Tag Valid returned on all invalid tags. Bus In parity checking circuits. Hardware counters in the device. Cylinder Address Register.	1	00	00–0B	Test number. (Allows looping a single test within this routine.) 00 (default)=Run all tests.	Routine A1 must run error free.	See MICFL section for flowchart and detailed description. Device Must be in CE Mode. HDA Ready is not required.

Routine ID (Hex)	Routine Name	Test No.	Test Name	Routine Description	Parameters				Prerequisites	Reference Notes
					Byte No.	Default Value (Hex)	Value Limits (Hex)	Description		
A5	Drive Index/Sector Tests	1 2 3 4 5 6	Target Register Index Force Multihead Check Force Sector Compare Check Test Sector Compare Attention Sector Compare	Routine A5 tests the following: Target register. Index and Sector Checks by forcing checking circuits to set and reset. Width of an Index pulse and the time between Indexes to verify that the rotational period is within specification. The set and reset of Sector Compare Check. The generation of Busy from a Set Target operation. Sector Compare Attention. The duration of a sector and compares it to the specification. Verifies that Sector Compare is active for sectors 1, 2, 4, 8, 16, 32, 64, and 127. Multichip Check by using a diagnostic command.	1	00	00–06	Test number. (Allows looping a single test within this routine.) 00 (default)=Run all tests.	Routines A1, A2, and B8 must run error free. HDA must be Ready.	See MICFL section for flowchart and detailed description.
A7	Dynamic Servo Adjustment Routine		Fine Adjustment	Routine A7 is used to adjust the servo velocity to specifications. The difference count range is from '08' through '0A' for a 192-cylinder Forward Seek. Routine A7 is not designed to be looped. After each adjustment, re-run routine A7.				None	Routines A1 and A2 must run error free. HDA must be Ready.	See MICFL section for flowchart and detailed description. Refer to MICRO 400 and ACC 800, Entry C, for details required for adjustment.
A9	Incremental Seek Test			Routine A9 seeks and verifies access position by reading the Home Address. <i>This routine loops indefinitely until stopped by the CE or an error occurs.</i> Note: <i>Regardless of feature installed, this routine will access only MOVABLE head tracks. Fixed heads are never addressed, whether or not a fixed head HDA is installed.</i>	1	01	01–FF	Desired increment. (Program defaults to one-cylinder seeks if no parameter is entered.)	Routines A1, A2, B8, A5, AD, AF, B9, and AE (linked series) must run error free. HDA must be Ready.	See MICFL section for flowchart and detailed description.

Routine ID (Hex)	Routine Name	Test No.	Test Name	Routine Description	Parameters				Prerequisites	Reference Notes
					Byte No.	Default Value (Hex)	Value Limits (Hex)	Description		
AA	Cylinder Seek Test			Routine AA seeks between two cylinders as specified by the parameter entry. The access position is verified by reading the Home Address. If no cylinders are specified by the parameter entry, the program defaults to a no-motion seek. <i>This routine loops indefinitely until stopped by the CE or an error occurs.</i> <i>Note: Regardless of feature installed, this routine will access only MOVABLE head tracks. Fixed heads are never addressed, whether or not a fixed head HDA is installed.</i>	1	00	00–FF	From cylinder address (Physical Address – See Reference Note 2)	Routines A1, A2, B8, A5, AD, AF, B9, and AE (linked series) must run error free. HDA must be Ready.	Note 1: Parameters 2 and 4: C C 0 Head Addr. must be zero Cylinder address 512 and 256 bits. Logical head address, <u>must</u> be the same for parameters 2 and 4. Maximum logical head address is 59 (decimal). Note 2: The maximum physical cylinder address that can be entered is 560 (decimal).
					2	00	xx	From head address (See Reference Note 1)		
					3	00	00–FF	To cylinder address (Physical Address – See Reference Note 2)		
					4	00	xx	To head address (See Reference Note 1)		
AB	Random Seek Test			Routine AB executes 1792 seeks using a random number generator as a seek argument. The Home Address is read after each seek and compared to the random number to verify access position. The program terminates on completion of the 1792nd seek. <i>Note: Regardless of feature installed, this routine will access only MOVABLE head tracks. Fixed heads are never addressed, whether or not a fixed head HDA is installed.</i>					Routines A1, A2, B8, A5, AD, AF, B9, and AE (linked series) must run error free. HDA must be Ready.	See MICFL section for flowchart and detailed description.

Routine ID (Hex)	Routine Name	Test No.	Test Name	Routine Description	Parameters				Prerequisites	Reference Notes
					Byte No.	Default Value (Hex)	Value Limits (Hex)	Description		
AD	Gap Counter and Data Transfer Tests	1	Data Transfer Checkers Check	Routine AD tests the following:	1	00	00–09	Test number. (Allows looping a single test within this routine.)	Routines A1, A2, B8, and A5 must run error free. HDA must be Ready and Read/Write enabled.	See MICFL section for flowchart and detailed description.
		2	G1 Gap Tolerance	Operation of the Diagnostic Write Inhibit to the device.						
		3	Extended G1 Gap Tolerance	Gap Counter Check.				00 (default)=Run all tests.		
		4	Modulo-16 Counter	Write Data Check.						
		5	G2 Gap Tolerance	Compares the length of the G1 gap to the specification (118±3 microseconds).						
		6	G3 Gap Tolerance							
		7	Data Transfer	Compares the length of the extended G1 gap to the specification (262±7 microseconds).						
		8	Write Safety Checkers Check	Modulo-16 Counter.						
		9	Pad Gate Check and Head Short Check	Compares the G2 gap to the specification (75-79 microseconds). Compares the G3 gap to the specification (77-82 microseconds). The data path from the interface through SERDES. Control Check. Write Overrun Check. Transition Check. Write Current Check. Pad Gate. Head Short Check.						
AE	Error Correction Code (ECC) Test	1	ECC Reset	Routine AE tests the following:	1	00	00–05	Test number. (Allows looping a single test within this routine.)	Routines A1, A2, B8, A5, AD, and AF must run error free. HDA must be Ready and Read/Write enabled.	See MICFL section for flowchart and detailed description.
		2	ECC Read Normal Data	Test 1–The set and reset of the ECC registers.	2	00	00–02	00 (default)=Run all tests.		
		3	ECC Read Correctable Data Check	Test 2–The ECC hardware while ready an error-free data pattern.						
		4	ECC Read Uncorrectable Data Check	Test 3–The ECC hardware while reading a correctable Data Check pattern.						
		5	ECC Write Bus Burst (ECC Check Pattern)	Test 4–The ECC hardware while reading an uncorrectable Data Check pattern.				Loop control. 00=Loop write and read. 01=Loop write phase only. 02=Write one time and loop read phase.		
				Test 5–The ECC pattern written after writing a 1-byte data pattern, reading back 7 bytes, and then doing a byte-by-byte Compare.						

Routine ID (Hex)	Routine Name	Test No.	Test Name	Routine Description	Parameters				Prerequisites	Reference Notes
					Byte No.	Default Value (Hex)	Value Limits (Hex)	Description		
AF	Format Read/Write Tests			Routine AF tests the following:	1	00	00–0F	Test number. (Allows looping a single test within this routine.) See Reference Notes 1 through 4 for prerequisites required by certain tests.	Routines A1, A2, B8, A5, and AD must run error free. HDA must be Ready and Read/Write Enabled.	See MICFL section for flowchart and detailed description. Note 1: Since all tests that write in routine AF depend on the access being positioned on the CE track (that is, physical cylinder 560), it is imperative that the access is not mechanically repositioned off of this cylinder. Every precaution has been included to detect any movement of the access electrically, including HDA Ready condition while running routine AF. Note 2: Test 9 depends upon successful completion of test 8 in order to run error free. Observe caution when using the loop test option. Note 3: Test B depends upon successful completion of Test A in order to run error free. Observe caution when using the loop test option. Note 4: Test 6 depends on the proper placement of the G1 Record (HA) on the track. Test E formats a G1 record.
		1	Read G1 Unoriented Status	Test 1 – Ability to orient on Index and Active Track and to reset unoriented status.						
		2	Oriented/Unoriented Border Line	Test 2 – Verifies that Orientation is maintained for the specified time and that Lost Orientation occurs at the specified time.						
		3	Force Command Overrun and Check End	Test 3 – Verifies the operation of Command Overrun in both Read and Write mode.	2	00	5D	Password parameter. (Valid password= '5D'.)		
		4	Force Sync Out Timing Error and Force Status Overrun	Test 4 – The Sync Out timing and Status Overrun checkers.				Caution Extreme caution must be exercised when overriding the default parameter. In normal operation, the Home Address is read to verify access position on the CE cylinder. If it is impossible to read the Home Address on this cylinder without error, the program terminates with an error. The CE can elect to continue testing with routine AF by entering the valid password parameter. Again, caution must be observed as this allows the possibility of destroying customer data. The procedure is as follows:		
		5	Test Allow HAR Function	Test 5 – The Allow HAR function in the window past the Index Format operation.				1. Reload routine AF.		
		6	Write Full Track G2	Test 6 – The successful writing of a full track R0 Count field. See Reference Note 4.				2. Enter: 10, 0E, 5D, 00.		
		7	Write G2/Force Track Overrun	Test 7 – The operation of the Track Overrun checker by attempting to write into Index.				3. Reload routine AF and run in default mode.		
		8	Write G2/Format Write G2	Test 8 – The operation of the Write G2 and Format Write G2 commands.						
		9	Read G2/Clock G2 Force No Sync Found	Test 9 – The operation of the Read G2 and Clock G2 commands. This test also verifies the operation of the No Sync Found checkers. See Reference Note 2.						
		A	Format Write G3/Read G3	Test A – The operation of Format Write G3 and Read G3 commands.						
		B	Clock G3/Read G3 AM Search	Test B – The operation of Clock G3 and Read G3 AM Search commands. See Reference Note 3.						
		C	Format Erase, Force No AM Found	Test C – The operation of the Format Erase Command. This test also verifies operation of the No AM Found checker by searching for the AM on the previously erased track.						
		D	Special Format Write G1/Read G1	Test D – The operation of the special Format Write G1 and the Read G1 commands.						
		E	Format Write G1/Read G1	Test E – The operation of the Format Write G1 command.						
		F	Skip Displacement Fields	Test F – The operation of commands used for defect skipping, Special Write G2, Special Read G2, Write G4, and Read G4.						

DESCRIPTION

Introduction

Routine B0 is a utility microprogram designed to format one track or all tracks on the CE cylinder.

The formatting steps are as follows:

- 1. Verify access position
- 2. Write Home Address (G1)
- 3. Write R0 Count (G2)
- 4. Write R0 Data (G2)
- 5. Write R1 Count (G3)
- 6. Write R1 Data (G2)–See Figure 1
- 7. Read Home Address (G1)
- 8. Read R0 Count (G2)
- 9. Read R0 Data (G2)
- 10. Read R1 Count (G3)
- 11. Read R1 Data (G2)
- 12. Steps 2 through 11 are repeated for each CE track if the entire CE cylinder is being formatted.
- 13. All fields on all tracks (even or odd Indexes) on the CE cylinder are read, even if only one track is being formatted.

The data patterns consist of:

- 1. Standard Home Address (14 Bytes)
- 2. Standard R0 Count field (18 Bytes)
- 3. An R0 Data field of zeros (8 Bytes)
- 4. Standard R1 Count field (18 Bytes)
- 5. An R1 Data field—see Figure 1 (256 Bytes)

Options

Routine B0 does not run in default mode. Parameters must be entered. There are two run options:

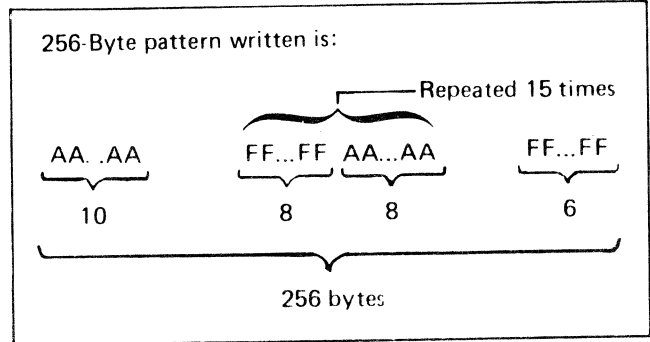
- 1. Format entire CE cylinder (even or odd Index).
- 2. Format single CE track (even or odd Index).

OPERATING INSTRUCTIONS

Refer to the flowchart on MICRO 54 for the running instruction logic of routine B0.

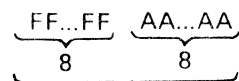
Parameters			
Byte No.	Default Value (Hex)	Value Limits (Hex)	Description
1	None	00 or 10	Bit Control Switches
			0 Must be zero
			1 Must be zero
			2 Must be zero
			3 1 = Write CE cylinder even or odd Index
			0 = Write single track even or odd Index
			4 Must be zero
			5 Must be zero
			6 Must be zero
			7 Must be zero
2	None	02	Cylinder High (This byte must be '02'.)
3	None	30	Cylinder Low (This byte must be '30'.)
4	None	00-3B	Selected head address. See Figure 2 for head values. If Byte 1, bit 3=1, enter '00' for even Index or '01' for odd Index.
5	None	00 or 5D	PASSWORD (5D) This byte must be entered if the entire CE cylinder is to be formatted or if the access position cannot be verified during the formatting of a single CE track.

Figure 1. R1 Data Field (See Note)



Note: For System/370, Model 135 IFA, 256 bytes of 'AA' are written.

For System/370, Models 115 and 125 DDA, the 256-byte pattern written is:

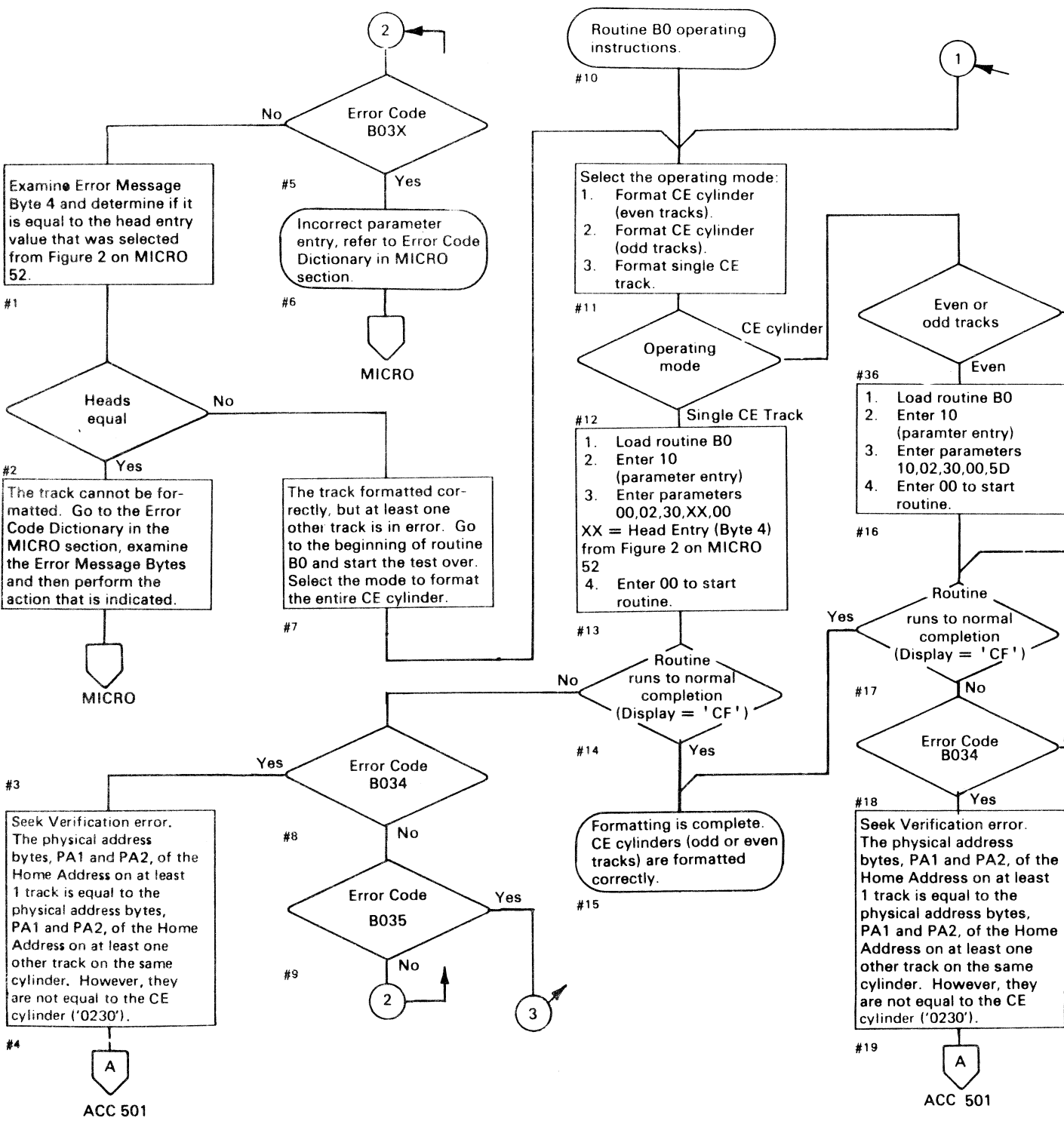


Repeated 16 times = 256 bytes

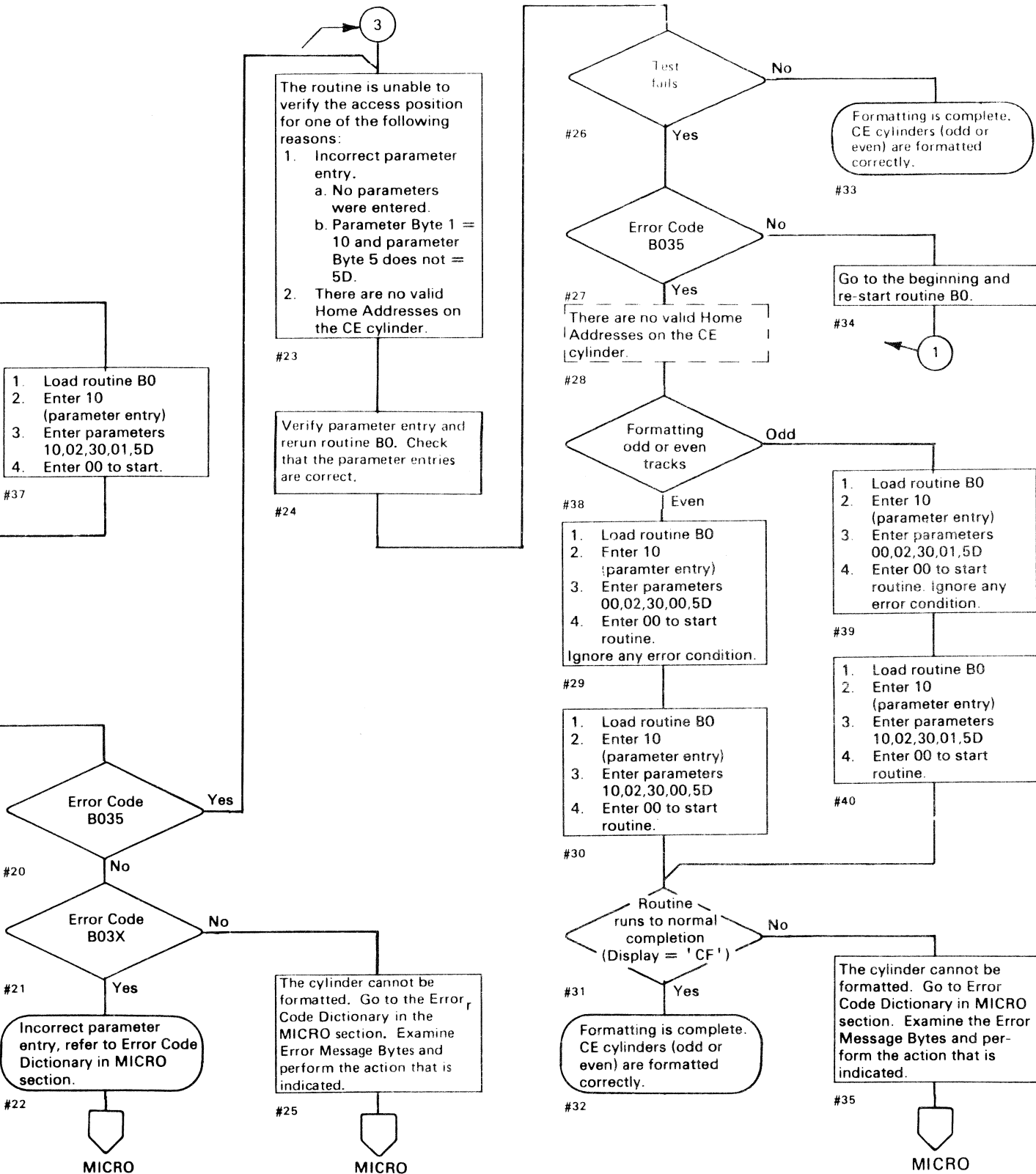
Figure 2. Movable Head Chart

Physical Head Number		Byte 4 Parameter	
Dec	Hex	Even Index	Odd Index
00	00	00	01
01	01	02	03
02	02	04	05
03	03	06	07
04	04	08	09
05	05	0A	0B
06	06	0C	0D
07	07	0E	0F
08	08	10	11
09	09	12	13
10	0A	14	15
11	0B	16	17
12	0C	18	19
13	0D	1A	1B
14	0E	1C	1D
15	0F	1E	1F
16	10	20	21
17	11	22	23
18	12	24	25
19	13	26	27
20	14	28	29
21	15	2A	2B
22	16	2C	2D
23	17	2E	2F
24	18	30	31
25	19	32	33
26	1A	34	35
27	1B	36	37
28	1C	38	39
29	1D	3A	3B

ROUTINE B0 RUNNING INSTRUCTIONS



ROUTINE B0 RUNNING INSTRUCTIONS MICRO 54



DESCRIPTION

Introduction

This routine can read data from any cylinder and/or head on the selected CE drive (including fixed heads). Correct operation is verified by not receiving any of the following:

- Equipment Check
- No Data Found
- No Sync Byte Found
- ECC Data Check

Correct operation is further verified by receiving the correct physical address (PA bytes in the Home Address and R0 Count areas). No customer data is transferred or stored.

Default Mode

In Default Mode, the routine seeks to cylinder 4 and reads the CE cylinder (even tracks). If the drive is equipped with fixed heads, the routine will also seek to the fixed-head cylinders and read all the even fixed-head tracks.

All ECC Data Check and No Sync Byte Found errors are accumulated in a summary log. The summary log may be displayed at the completion of the run. Refer to error messages B1FD, B1FE, and B1FF in the Error Code Dictionary.

Options

1. *Test Cylinder/Summary Log Errors:* This option allows any cylinder or all fixed heads (even or odd Index) to be tested using all physical heads. A summary log of failing heads is provided at the completion of the run. Refer to error messages B1FD, B1FE, and B1FF in the Error Code Dictionary. A summary log may be obtained for either Data Checks or Seek Verification errors (but not both), depending on the parameter entry.
2. *Test Cylinder/Suppress Summary Logging:* This option is the same as Test Cylinder except the routine stops on the first error. The routine can be instructed to continue to the next track address in error by using the '00' option. This option is useful for gathering additional information pertaining to the failures on a particular head.

3. *Test Track:* This option is used for performing Read operations on a specific track and stopping on an error.
4. *Scope Loop:* This option is useful for scoping a single track. All errors are bypassed.

OPERATING INSTRUCTIONS

Default Mode – Basic Operation

1. Verify that the correct microdiagnostic disk is installed.
2. Load routine B1.
3. Enter '00' in the Data Entry switches and operate the Execute switch.

Test Cylinder/Summary Log Errors

1. Verify that the correct microdiagnostic disk is installed.
2. Load routine B1.
3. Enter '10' in the Data Entry switches (parameter entry) and operate the Execute switch.
4. Enter one of the following for the control byte:

For movable heads/summary log Data Checks – '90'

For movable heads/summary log Seek Verification errors – '94'.

For fixed heads/summary log Data Checks – 'B0'.

For fixed heads/summary log Seek Verification errors – 'B4'.

5. If the physical cylinder is not known, go to R/W 400 to convert Sense Bytes 5 and 6 to the physical cylinder. The CE cylinder is '0230'.

6. Enter the high order physical cylinder byte from Step 5, or enter:

For cylinder 4 – '00'

For CE cylinder – '02'

For fixed heads – '00'

7. Enter the low order physical cylinder byte from Step 5, or enter:

For cylinder 4 – '04'

For CE cylinder – '30'

For fixed heads – '00'
8. Enter track selection:

For even tracks – '00'
For odd tracks – '01'
9. Enter '00'

Test Cylinder – Loop and Accumulate Errors

1. Perform Steps 1 through 8 as in Test Cylinder operation.
2. Enter '03' to loop the routine and suppress errors.
3. Enter '00' to start routine B1.
4. Enter '08' to reset the loop option. Let the routine run to its normal completion or to an error stop. If error stops B1FD through B1FF are indicated, a summary of the failing heads is in the display bytes. See the Error Code Dictionary in the MICRO section for details concerning these error stops.

Test Cylinder/Suppress Summary Logging

1. Verify that the correct microdiagnostic disk is installed.
2. Load routine B1.
3. Enter '10' in the Data Entry switches (parameter entry) and operate the Execute switch.
4. Enter the control byte:

For movable heads and summary log Data Checks – '90'
For movable heads and summary log Seek Verification Checks – '94'
For fixed heads and summary log Data Checks – 'B0'
For fixed heads and summary log Seek Verification Checks – 'B4'
5. If the physical cylinder is not known, go to R/W 400 to convert Sense Bytes 5 and 6 to the physical cylinder. The CE cylinder is '0230'.

6. Enter the high order physical cylinder byte from Step 5, or enter:

For cylinder 4 – '00'

For CE cylinder – '02'

For fixed heads – '00'
7. Enter the low order physical cylinder byte from Step 5, or enter:

For cylinder 4 – '04'

For CE cylinder – '30'

For fixed heads – '00'
8. Enter track selection:

For even tracks – '00'
For odd tracks – '01'
9. Enter '00'

After an error occurs, the message display may be read by using the error display control option '20' (refer to MICRO 10 through 12). The routine may be continued by using the '00' control option. The routine will step to the next head and continue.

OPERATING INSTRUCTION – Continued

Parameters for Test Track and Scope Loop

There are four ways the parameters can be entered. These are:

- Test Track – Logical
- Test Track – Physical
- Scope Loop – Logical
- Scope Loop – Physical

The parameter data to be entered will be one of two types. First there is the logical data. This data is determined from the channel unit address and Sense Bytes 5 and 6. The second type of data is the physical. Physical data is determined from the physical cylinder and head numbers.

Parameter data must be entered either in the logical format or the physical format but not in a combination of both types.

Note: *The physical cylinder and head number may be determined after the program has run whether or not an error has occurred. The physical cylinder and head are found by displaying the message display bytes using the control option '20'. The message bytes displayed are:*

1. *Error Number (if an error occurred)*
2. *Physical Cylinder High*
3. *Physical Cylinder Low*
4. *HAR value*

Use the Physical Head Charts on MICRO 58 to convert HAR values to the physical head values. The HAR values are in the same format as Byte 4 Parameters.

Test Track – Logical

1. Verify that the correct microdiagnostic disk is installed.
2. Load routine B1.
3. Enter '10' in the Data Entry switches (parameter entry) and operate the Execute switch.
4. Enter '00' for logical type parameters.
5. Enter 'XX' ('XX' = unit address, low-order byte of the Channel Unit Address (CUA) from the system printout or from the identification sticker on the Operator Panel). For System/3 DSA, see Reference Note 2 on MICRO 58.
6. Enter Sense Byte 5.
7. Enter Sense Byte 6.
8. Enter '00' and operate the Execute switch to start the routine.
9. See Note.

Test Track – Physical

1. Verify that the correct microdiagnostic disk is installed.
2. Load routine B1.
3. Enter '10' in the Data Entry switches (parameter entry) and operate the Execute switch.
4. Enter the control byte:
For movable heads – '80'
For fixed heads – 'A0'
5. Enter the high-order cylinder address. The range is '00' through '02'. The CE cylinder is '02'.
00 = cylinder 0–255
01 = cylinder 256–511
02 = cylinder 512–560
Default = cylinder 4
6. Enter the low-order cylinder address. The range is '00' through 'FF'. The CE cylinder is '30'.
7. Enter the head address byte. See the Physical Head Charts on MICRO 58.
8. Enter '00' and operate the Execute switch to start the routine.

Scope Loop – Logical

1. Verify that the correct microdiagnostic disk is installed.
2. Load routine B1.
3. Enter '10' in the Data Entry switches (parameter entry) and operate the Execute switch.
4. Enter '40' for logical type parameters.
5. Enter 'XX' ('XX' = unit address, low-order byte of the Channel Unit Address (CUA) from the system printout or from the identification sticker on the Operator Panel). For System/3 DSA, see Reference Note 2 on MICRO 58.
6. Enter Sense Byte 5.
7. Enter Sense Byte 6.
8. Enter '00' and operate the Execute switch to start the routine.

Scope Loop – Physical

1. Verify that the correct microdiagnostic disk is installed.
2. Load routine B1.
3. Enter '10' in the Data Entry switches (parameter entry) and operate the Execute switch.
4. Enter the control byte:
For movable heads – 'C0'
For fixed heads – 'E0'
5. Enter the high-order cylinder address. The range is '00' through '02'. The CE cylinder is '02'.
6. Enter the low-order cylinder address. The range is '00' through 'FF'. The CE cylinder is '30'.
7. Enter the head address byte. See the Physical Head Charts on MICRO 58.
8. Enter '00' and operate the Execute switch to start the routine.

Parameters				Prerequisites	Reference Notes
Byte No.	Default Value (Hex)	Value Limits (Hex)	Description		
1	98	XX	Bit Control Switches 0 Select physical address mode 1 Select scope loop 2 Select fixed head(s) 3 Read entire cylinder and/or all fixed heads 4 If bit 3 = 1, advance to fixed heads if they are installed 5 1 = Summary log Seek Verification Errors 0 = Summary log Data Checks 6 Suppress summary logging 7 Must be 0		Note 1: Routine B1 requires a standard HA and R0 on all tracks being read. If while running on the CE cylinders, track format problems are suspected or track addressing problems are experienced, run routine B2 in Default Mode. Routine B2 will read HA, R0, and R1. If routine B2 generates errors while reading the HAs, routine B0 should be run. Routine B0 will write the HA(s), R0(s), and R1(s) on the CE track(s). Refer to MICRO 52 for run instructions. Note 2: If storage control is a System/3 DSA, enter the logical unit address as follows: bits 0-3 = same as bits 0-3 of Sense Byte 3 bits 4-7 = physical drive number If Sense Byte 4 equals: 1 D0 to D4, enter 3 2 D8 to DC, enter 4
2	00	00-02	If Byte 1 bit 0 = 0, enter logical unit address. If Byte 1, bit 0 = 1, enter the high physical cylinder number. (Default = cylinder 4.) For System/3 DSA, see Reference Note 2.		
3	04	00-FF	If Byte 1, bit 0 = 0, enter logical unit address. If Byte 1, bit 0 = 1, enter the high physical cylinder number. (Default = cylinder 4).		
4	01	00-3B	If Byte 1, bit 0 = 0, enter Sense Byte 6. If Byte 1, bit 0 = 1, and if Byte 1, bit 2 = 0, enter the movable physical head. (See Physical Head Charts for correct entry.)		
4	01	40-B7	If Byte 1, bit 0 = 1, and if Byte 1, bit 2 = 1, enter the fixed physical heads. (See Physical Head Charts for correct entry.)		
4	01	00-01	If Byte 1, bit 0 = 1, and if Byte 1, bit 3 = 1, enter '00' for even tracks or '01' for odd tracks.		

PHYSICAL HEAD CHARTS

To be used to enter head number (Byte 4) if the physical address mode is selected. (Byte 1, bit 0 = 7.)

Movable Head

Head Number		Byte 4 Parameter (HAR Value)	
Dec	Hex	Even Index	Odd Index
00	00	00	01
01	01	02	03
02	02	04	05
03	03	06	07
04	04	08	09
05	05	0A	0B
06	06	0C	0D
07	07	0E	0F
08	08	10	11
09	09	12	13
10	0A	14	15
11	0B	16	17
12	0C	18	19
13	0D	1A	1B
14	0E	1C	1D
15	0F	1E	1F
16	10	20	21
17	11	22	23
18	12	24	25
19	13	26	27
20	14	28	29
21	15	2A	2B
22	16	2C	2D
23	17	2E	2F
24	18	30	31
25	19	32	33
26	1A	34	35
27	1B	36	37
28	1C	38	39
29	1D	3A	3B

Fixed Head

Head Number		Byte 4 Parameter (HAR Value)	
Dec	Hex	Even Index	Odd Index
00	00	40	41
01	01	42	43
02	02	44	45
03	03	46	47
04	04	48	49
05	05	4A	4B
06	06	4C	4D
07	07	4E	4F
08	08	50	51
09	09	52	53
10	0A	54	55
11	0B	56	57
12	0C	58	59
13	0D	5A	5B
14	0E	5C	5D
15	0F	5E	5F
16	10	60	61
17	11	62	63
18	12	64	65
19	13	66	67
20	14	68	69
21	15	6A	6B
22	16	6C	6D
23	17	6E	6F
24	18	70	71
25	19	72	73
26	1A	74	75
27	1B	76	77
28	1C	78	79
29	1D	7A	7B

Fixed Head continued

Head Number		Byte 4 Parameter (HAR Value)	
Dec	Hex	Even Index	Odd Index
30	1E	7C	7D
31	1F	7E	7F
32	20	80	81
33	21	82	83
34	22	84	85
35	23	86	87
36	24	88	89
37	25	8A	8B
38	26	8C	8D
39	27	8E	8F
40	28	90	91
41	29	92	93
42	2A	94	95
43	2B	96	97
44	2C	98	99
45	2D	9A	9B
46	2E	9C	9D
47	2F	9E	9F
48	30	A0	A1
49	31	A2	A3
50	32	A4	A5
51	33	A6	A7
52	34	A8	A9
53	35	AA	AB
54	36	AC	AD
55	37	AE	AF
56	38	B0	B1
57	39	B2	B3
58	3A	B4	B5
59	3B	B6	B7

DESCRIPTION

Introduction

Routine B2 is a utility microprogram designed to format one track or all tracks on the CE cylinder.

The formatting steps are as follows:

- 1. Read Home Address (G1)
- 2. Verify access position
- 3. Write R0 Count (G2)
- 4. Write R0 Data (G2)
- 5. Write R1 Count (G3)
- 6. Write R1 Data (G2) – See Figure 1
- 7. Read Home Address (G1)
- 8. Read R0 Count (G2)
- 9. Read R0 Data (G2)
- 10. Read R1 Count (G3)
- 11. Read R1 Data (G2)
- 12. Steps 1 through 11 are repeated for each CE track if the entire CE cylinder is being formatted.
- 13. All fields on all tracks on the CE cylinder are read, even if only one track is being formatted.

The data patterns consist of:

- 1. Standard Home Address (14 Bytes)
- 2. Standard R0 Count field (18 Bytes)
- 3. An R0 Data field of zeros (8 Bytes)
- 4. Standard R1 Count field (18 Bytes)
- 5. An R1 Data field – see Figure 1 (256 Bytes)

Options

- 1. *Default Mode.* Each odd track of the CE cylinder is written and verified. Then the entire CE cylinder is read again and checked for errors.
- 2. *Select Mode For Even Tracks.* Each even track of the CE cylinder is written and verified. Then the entire CE cylinder is read again and checked for errors.
- 3. *Single Track Mode.* The track selected by the parameter Byte 4 is written and verified. Then the entire CE cylinder is read back and checked for errors.

OPERATING INSTRUCTIONS

Default Mode

- 1. Verify that the correct microdiagnostic disk is installed.
- 2. Load routine B2.
- 3. Enter '00' in the Data Entry switches and operate the Execute switch to start the routine.

Select Mode For Even Tracks

- 1. Verify that the correct microdiagnostic disk is installed.
- 2. Load routine B2.
- 3. Enter '10' in the Data Entry switches (parameter entry) and operate the Execute switch.
- 4. Enter parameter bytes as follows: '10', '02', '30', '00'.
- 5. Enter '00' in the Data Entry switches and operate the Execute switch to start the routine.

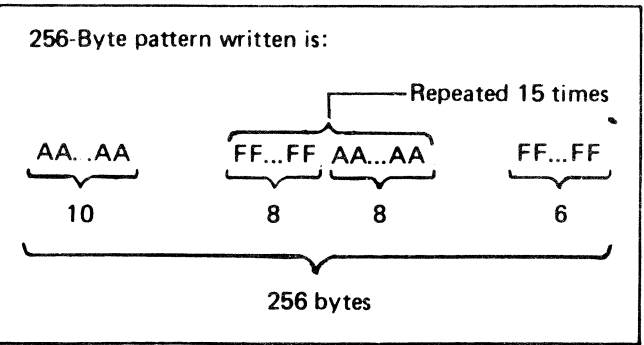
Single Track Mode

- 1. Verify that the correct microdiagnostic disk is installed.
- 2. Load routine B2.
- 3. Enter '10' in the Data Entry switches (parameter entry) and operate the Execute switch.
- 4. Enter parameter Bytes as follows: '00', '02', '30', 'XX'.
- 5. Enter '00' in the Data Entry switches and operate the Execute switch to start the routine.

Where XX = The physical head value selected from the Movable Head Chart (Figure 2).

Parameters			
Byte No.	Default Value (Hex)	Value Limits (Hex)	Description
1	10	00 or 10	Bit Control Switches
			0 Must be zero
			1 Must be zero
			2 Must be zero
			3 1 = Write CE cylinder even or odd Index
			0 = Write single track even or odd Index
			4 Must be zero
			5 Must be zero
2	02	02	High Cylinder Address (This byte must be '02')
3	30	30	Low Cylinder Address (This byte must be '30')
4	01	00–3B	Selected Head Address (See Figure 2 for head values.) If byte 1, bit 3 = 1, enter '00' for even Index or '01' for odd Index.

Figure 1. R1 Data Field (See Note)



Note: For System/370, Model 135 IFA, 256 bytes of 'AA' are written.

For System/370, Models 115 and 125 DDA, the 256-byte pattern written is:

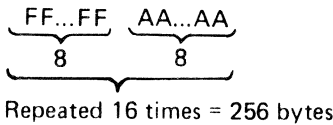


Figure 2. Movable Head Chart

Physical Head Number		Byte 4 Parameter	
Dec	Hex	Even Index	Odd Index
00	00	00	01
01	01	02	03
02	02	04	05
03	03	06	07
04	04	08	09
05	05	0A	0B
06	06	0C	0D
07	07	0E	0F
08	08	10	11
09	09	12	13
10	0A	14	15
11	0B	16	17
12	0C	18	19
13	0D	1A	1B
14	0E	1C	1D
15	0F	1E	1F
16	10	20	21
17	11	22	23
18	12	24	25
19	13	26	27
20	14	28	29
21	15	2A	2B
22	16	2C	2D
23	17	2E	2F
24	18	30	31
25	19	32	33
26	1A	34	35
27	1B	36	37
28	1C	38	39
29	1D	3A	3B

Routine ID (Hex)	Routine Name	Test No.	Test Name	Routine Description	Parameters				Prerequisites	Reference Notes																																
					Byte No.	Default Value (Hex)	Value Limits (Hex)	Description																																		
B3	Device Status Display Utility Routine			The device status display program is a utility that performs two functions: - Generates a Fault Symptom Code on pass 1 if the necessary error conditions stored in the device have not been reset. - Displays 15 bytes of device information on pass 2. See Reference Note 1. PASS 1 - Place drive to be tested in CE Mode (CE Mode switch on). - Load routine B3. - When loaded, enter '00' in the Data Entry switches, and operate the Execute switch once. - Program Control display should contain 'E1'. - Data display: '01' to '07' = Error attempting to run B3 routine. See MICRO 89. 'FF' = Unable to generate Fault Symptom Code. Run pass 2. - Other than above = Byte 1 of Fault Symptom Code. Enter '20' in the Data Entry switches, and operate the Execute switch once to display Byte 2 of the Fault Symptom Code. PASS 2 - After successful completion of pass 1 (indicated by items 5b. or 5c. above), enter '00' in the Data Entry switches and operate the Execute switch twice. - Completion of pass 2 is indicated by 'E1' in the Program Control display, and the bit significant physical address of the drive in CE Mode in the Data display ('80', '40', '20', '10', '08', '04', '02', or '01'). - Enter '20' in the Data Entry switches, and operate the Execute switch once for each of the remaining display bytes. As each byte is displayed, the Program Control display advances (E2, E3, etc.) to indicate which byte is displayed in the Data display. See Reference Note 1 for byte content. - After the last byte is displayed, operating the Execute switch results in 'CE' in the Program Control display and 'B3' in the Data display. - Any attempt to restart the routine (by entering '00' in the Data Entry switches and operating the Execute switch) results in rerunning only pass 2.					Controller interface operative to the point of loading and starting this routine. See MICRO 12 for details of Error/Message display information.	See MICFL section for flowchart and detailed description. Note 1: At the end of pass 2, the first of 15 bytes of logout are displayed. The content is as follows: <table><tr><th>Byte No.</th><th>Description</th></tr><tr><td>1. E1</td><td>Physical Drive Address</td></tr><tr><td>2. E2</td><td>Head Address Register</td></tr><tr><td>3. E3</td><td>Difference Counter</td></tr><tr><td>4. E4</td><td>Drive Status</td></tr><tr><td>5. E5</td><td>Check Status</td></tr><tr><td>6. E6</td><td>HDA Sequence Control</td></tr><tr><td>7. E7</td><td>Load Switch Status</td></tr><tr><td>8. E8</td><td>Read/Write Safety</td></tr><tr><td>9. E9</td><td>Access Status</td></tr><tr><td>10. EA</td><td>Controller Check</td></tr><tr><td>11. EB</td><td>Controller Interface Check</td></tr><tr><td>12. EC</td><td>Device Interface Check</td></tr><tr><td>13. ED</td><td>Target Register (RPS)</td></tr><tr><td>14. EE</td><td>Cylinder Address Register (String Switch)</td></tr><tr><td>15. EF</td><td>Sense Status 0</td></tr></table> Refer to FS1 65 for bit significance of the message bytes. Note 2: Reloading and restarting this routine yields different results. This is because any error condition was reset during pass 1 (original execution of pass 1).	Byte No.	Description	1. E1	Physical Drive Address	2. E2	Head Address Register	3. E3	Difference Counter	4. E4	Drive Status	5. E5	Check Status	6. E6	HDA Sequence Control	7. E7	Load Switch Status	8. E8	Read/Write Safety	9. E9	Access Status	10. EA	Controller Check	11. EB	Controller Interface Check	12. EC	Device Interface Check	13. ED	Target Register (RPS)	14. EE	Cylinder Address Register (String Switch)	15. EF	Sense Status 0
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					Byte No.	Default Value (Hex)	Value Limits (Hex)	Description																																																																																																																																																																		
B4	Tag Cycle Utility		This routine executes any valid tag/bus or delay commands entered by the CE through parameter entry. (Refer to OPER 98 through 101 for tag/bus summary.)	<i>Write Op (Tag '0F') under drive selection, Seek Start (Tag '8F', Bus '08), and Rezero (Tag '8F' Bus '02') cannot be used.</i> Each delay or tag command consists of two bytes of parameter entry, and up to seven commands may be entered at one time. These entries are referred to as the command string. Following the last command, zeros must be entered to complete the parameter field. Once execution has been started, the command string loops until the CE enters a '00' in the Data Entry switches and operates the Execute switch. The command format is as follows: Control Byte (First Byte of Command) <table><thead><tr><th>Option Code</th><th>Modifier</th><th>Description</th></tr></thead><tbody><tr><td>Bits 0123</td><td>4567</td><td></td></tr><tr><td>0000</td><td>0000</td><td>End command string.</td></tr><tr><td>0000</td><td>XXXX</td><td>Controller tag. XXXX = tag value.</td></tr><tr><td>0001</td><td>XXXX</td><td>Controller tag. CE switches are used for Bus Out.</td></tr><tr><td>0010</td><td>XXXX</td><td>Controller tag. Received Bus In is transmitted to the Data display lamps.</td></tr><tr><td>0011</td><td>MMMM</td><td>Execute a microsecond delay. MMMM = the base value multiplier (not used if zero).</td></tr><tr><td>0100</td><td>MMMM</td><td>Execute a millisecond delay. MMMM = the base value multiplier (not used if zero).</td></tr><tr><td>0101-0111</td><td></td><td>Not used.</td></tr><tr><td>1000</td><td>XXXX</td><td>Drive tag. XXXX = tag value.</td></tr><tr><td>1001</td><td>XXXX</td><td>Drive tag. CE switches are used for Bus Out.</td></tr><tr><td>1010</td><td>XXXX</td><td>Drive tag. Received Bus In transmitted to the Data display lamps.</td></tr><tr><td>1011-1111</td><td></td><td>Not used.</td></tr></tbody></table> Bus Out or Base Delay Value (Second Byte of Command) - During a Tag command, the second byte is the Bus Out value, unless option code 0001 or 1001 has been selected. - During a delay command, the second byte is the base delay value. The base value is multiplied by 'MMMM' in the control byte to arrive at the total display value (see Note 1).	Option Code	Modifier	Description	Bits 0123	4567		0000	0000	End command string.	0000	XXXX	Controller tag. XXXX = tag value.	0001	XXXX	Controller tag. CE switches are used for Bus Out.	0010	XXXX	Controller tag. Received Bus In is transmitted to the Data display lamps.	0011	MMMM	Execute a microsecond delay. MMMM = the base value multiplier (not used if zero).	0100	MMMM	Execute a millisecond delay. MMMM = the base value multiplier (not used if zero).	0101-0111		Not used.	1000	XXXX	Drive tag. XXXX = tag value.	1001	XXXX	Drive tag. CE switches are used for Bus Out.	1010	XXXX	Drive tag. Received Bus In transmitted to the Data display lamps.	1011-1111		Not used.	<table><thead><tr><th>Byte No.</th><th>Default Value (Hex)</th><th>Value Limits (Hex)</th><th>Description</th></tr></thead><tbody><tr><td>.</td><td>.</td><td>.</td><td rowspan="4">Each of the following commands contain a control byte and a Bus Out or delay value.</td></tr><tr><td>.</td><td>.</td><td>.</td></tr><tr><td>.</td><td>.</td><td>.</td></tr><tr><td>.</td><td>.</td><td>.</td></tr><tr><td>1 & 2</td><td>00</td><td>00-FF</td><td>1st Command</td></tr><tr><td>3 & 4</td><td>00</td><td>00-FF</td><td>2nd Command</td></tr><tr><td>5 & 6</td><td>00</td><td>00-FF</td><td>3rd Command</td></tr><tr><td>7 & 8</td><td>00</td><td>00-FF</td><td>4th Command</td></tr><tr><td>9 & A</td><td>00</td><td>00-FF</td><td>5th Command</td></tr><tr><td>B & C</td><td>00</td><td>00-FF</td><td>6th Command</td></tr><tr><td>D & E</td><td>00</td><td>00-FF</td><td>7th Command</td></tr><tr><td>F</td><td>00</td><td>00</td><td>End String Command</td></tr></tbody></table> Note 1: Example of delays. <table><thead><tr><th colspan="2">ENTRY IN HEX</th><th>DELAY VALUE</th></tr><tr><th>Byte 1</th><th>Byte 2</th><th></th></tr></thead><tbody><tr><td>30</td><td>C8</td><td>200 usec</td></tr><tr><td>32</td><td>C8</td><td>400 usec</td></tr><tr><td>40</td><td>C8</td><td>200 msec</td></tr><tr><td>41</td><td>C8</td><td>200 msec</td></tr><tr><td>43</td><td>64</td><td>300 msec</td></tr><tr><td>11</td><td></td><td>64 hex is 100 decimal</td></tr><tr><td>11</td><td></td><td>100 x 3 = 300</td></tr><tr><td>11</td><td></td><td>4 = milliseconds total = 300 ms</td></tr></tbody></table> The sum of all delay commands must not exceed 500 milliseconds. Note 2: The controller address is also supplied for Select Controller tag.	Byte No.	Default Value (Hex)	Value Limits (Hex)	Description	.	.	.	Each of the following commands contain a control byte and a Bus Out or delay value.	.	.	.	.	.	.	.	.	.	1 & 2	00	00-FF	1st Command	3 & 4	00	00-FF	2nd Command	5 & 6	00	00-FF	3rd Command	7 & 8	00	00-FF	4th Command	9 & A	00	00-FF	5th Command	B & C	00	00-FF	6th Command	D & E	00	00-FF	7th Command	F	00	00	End String Command	ENTRY IN HEX		DELAY VALUE	Byte 1	Byte 2		30	C8	200 usec	32	C8	400 usec	40	C8	200 msec	41	C8	200 msec	43	64	300 msec	11		64 hex is 100 decimal	11		100 x 3 = 300	11		4 = milliseconds total = 300 ms	Control Interface operative to the point of loading and starting this routine. See MICFL section for flowchart and detailed description. SAMPLE COMMAND STRING <table><thead><tr><th>Parameter Byte</th><th>(Hex)</th><th></th></tr></thead><tbody><tr><td>1</td><td>83</td><td>Tag (select drive) (See Note 2)</td></tr><tr><td>2</td><td>XX</td><td>Bus Out is supplied by the program (service drive only)</td></tr><tr><td>3</td><td>9B</td><td>Drive tag (set HAR CE switches to be used for Bus Out)</td></tr><tr><td>4</td><td>XX</td><td>Bus Out from CE switches</td></tr><tr><td>5</td><td>AF</td><td>Drive tag (sense HAR) Bus In transmitted to data display lights</td></tr><tr><td>6</td><td>05</td><td>Bus Out for sense HAR</td></tr><tr><td>7</td><td>8C</td><td>Drive tag (set difference to 'FF')</td></tr><tr><td>8</td><td>FF</td><td>Bus Out value</td></tr><tr><td>9</td><td>8F</td><td>Drive tag (sense difference)</td></tr><tr><td>A</td><td>09</td><td></td></tr><tr><td>B</td><td>42</td><td>200 ms delay</td></tr><tr><td>C</td><td>64</td><td></td></tr><tr><td>D</td><td>00</td><td rowspan="3">Filler for parameter field</td></tr><tr><td>E</td><td>00</td></tr><tr><td>F</td><td>00</td></tr></tbody></table> AF05 Sense HAR The run control option '00' must be entered to begin the program execution. The desired HAR value must be set in the Data Entry switches as soon as the '8C' message is displayed in the control lamps.	Parameter Byte	(Hex)		1	83	Tag (select drive) (See Note 2)	2	XX	Bus Out is supplied by the program (service drive only)	3	9B	Drive tag (set HAR CE switches to be used for Bus Out)	4	XX	Bus Out from CE switches	5	AF	Drive tag (sense HAR) Bus In transmitted to data display lights	6	05	Bus Out for sense HAR	7	8C	Drive tag (set difference to 'FF')	8	FF	Bus Out value	9	8F	Drive tag (sense difference)	A	09		B	42	200 ms delay	C	64		D	00	Filler for parameter field	E	00	F	00
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9 & A	00	00-FF	5th Command																																																																																																																																																																							
B & C	00	00-FF	6th Command																																																																																																																																																																							
D & E	00	00-FF	7th Command																																																																																																																																																																							
F	00	00	End String Command																																																																																																																																																																							
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7	8C	Drive tag (set difference to 'FF')																																																																																																																																																																								
8	FF	Bus Out value																																																																																																																																																																								
9	8F	Drive tag (sense difference)																																																																																																																																																																								
A	09																																																																																																																																																																									
B	42	200 ms delay																																																																																																																																																																								
C	64																																																																																																																																																																									
D	00	Filler for parameter field																																																																																																																																																																								
E	00																																																																																																																																																																									
F	00																																																																																																																																																																									

Routine ID (Hex)	Routine Name	Test No.	Test Name	Routine Description	Parameters				Prerequisites	Reference Notes
					Byte No.	Default Value (Hex)	Value Limits (Hex)	Description		
B6	String Switch Test <i>This routine can only be executed on 3340s with the string switch feature installed. See the 3340 MLM.</i>									
B8	HDA/Control Logic Tests	1 2 3 4 5 6 7 8 9 A B C D E F	HDA Status Access Timer Accuracy Rezero from outer stops - Part 1 Rezero from outer stops - Part 2 Rezero from Track 0 No Motion Seek Seek Movement basic Overshoot Check Safety test Difference Counter Verification - Part 1 Velocity Gain Calibration Check Overshoot Check test Unsuppressible Register Set Read/Write Tag Missing Servo Input and Missing Data Input Servo Off-Track Error Verification	Routine B8 tests the following: The ability to reset Drive Check and Attention. Access Safety Timer. Basic Rezero operations. No-motion seek response and select carriage movement after a Seek. Overshoot error detection circuits and Difference Counter stopping during a Seek. Servo acceleration velocity gain calibration and operation of the Track Following Timer. Unsuppressible Register. Set Read/Write Tag. The set and reset of missing data input errors. The set of Error Alert and Controller Check. The checking circuits for Servo Off Track, Set Read/Write operation, and Index.	1	00	00–0F	Test number. (Allows looping a single test within this routine.) 00 (default) = Run all tests	Routines A1 and A2 must run error free. The HDA must be Ready. Check disks to be sure they are spinning as the Ready lamp may be burned out.	See MICFL section for flowchart and detailed description.

Routine ID (Hex)	Routine Name	Test No.	Test Name	Routine Description	Parameters				Prerequisites	Reference Notes
					Byte No.	Default Value (Hex)	Value Limits (Hex)	Description		
B9	Dynamic Servo Tests	1	Rezero, Read Home Address	Routine B9 tests the following: Verification of access position by reading Home Address and comparing the two physical address bytes to the expected values. The Difference Counter during Seek operations. Various values are set into the Difference Counter and then compared to the program pulse counter. The odd bit is tested for the proper state after each Seek.	1	00	00–07	Test number. (Allows looping a single test within this routine.)	Routines A1, A2, B8, A5, AD, and AF must run error free. HDA must be Ready.	See MICFL section for flowchart and detailed description.
		2	Difference Counter Verification—Part 2		2	00	01–FF	00 (default) = Run all tests		
		3	Incremental Seek Increment = 1					Used for test 2 only. Specify the seek length (1 through 255). Hex '01' through 'FF'.		
		4	Incremental Seek Increment = 2							
		5	Incremental Seek Increment = 70							
		6	Incremental Seek Increment = 280							
		7	Incremental Seek Increment = 560							
BA	HDA State Analysis			Routine BA analyzes the following Status Bytes: Sense Status 1 (Tag '8F' Bus '83') Sense Status 2 (Tag '8F' Bus '43') Sense Status 3 (Tag '8F' Bus '23') Sense Status 4 (Tag '8F' Bus '13') The routine produces a unique error number according to the contents of the Status Bytes.				None	Routines A1, all tests, and routine A2, tests 1 through 7, must run error free.	See MICFL section for flowchart and detailed description.

Routine ID (Hex)	Routine Name	Test No.	Test Name	Routine Description	Parameters				Prerequisites	Reference Notes
					Byte No.	Default Value (Hex)	Value Limits (Hex)	Description		
BD	Vibration Tolerance Test			Routine BD exercises the servo by issuing a series of forward and reverse seeks, both near the inner and outer regions of the disk. There is careful control over the time between the end of one seek and the start of the next seek (in the opposite direction).	1	00	00,80	Control Byte Bit 0 = 0 Time between seeks is incremented from the value entered in Byte 3 to the maximum value. Bit 0 = 1 Time between each seek is the value entered in Byte 3.	Routines A1, A2, and B8 must run error free. Run routine in the offline mode only.	See MICFL section for flowchart and detailed description.
					2	07	01–FF	Seek length in number of cylinders. ('00' = Invalid.)		
					3	1B	00–FF	Starting delay value in microseconds.		
					4	58	00–FF			
BF	Control Interface Bringup Routine (for System/370 Models 115, 125 and 4331)	1	Active Control Bus In/Control Lines test	This routine is identical to routine HC, but is designed to be run only on System/370 Models 115 and 125, and 4331. Loading and execution is similar to other microdiagnostics on these systems.					Not linked. Controller must be capable of a Power-On Reset. System/370 Models 115 and 125 DDA and SVP or 4331 must be operational.	See MICFL 860 for detailed description. Use description and flowcharts for routine HC. For System 370 Models 115 and 125 see Direct Disk Attachment (DDA) MLM (MLX, Entry 11) for running instructions. For 4331 refer to STM for running instructions.
		2	Tag Bus/Control Bus Out test							
		3	Control Lines test							
HC	Control Interface Bringup Routine	1	Active Control Bus In/Control Lines test	Routine HC is an interface analysis test that checks for always active or missing interface control lines. Note: <i>This routine must be executed from the storage control (3830-2, ISC, or IFA).</i> For 3880 attachment, use the 3880 wrap test in the place of HC. 3340 1 3880 Storage Control MLX Chart				None	Controller must be capable of a Power-On Reset. Storage Control must be operational. <i>See CTL-1 100 for the complete Interface Analysis Procedure.</i>	See MICFL section for flowchart and detailed description.
		2	Tag Bus/Control Bus Out test							
		3	Control Lines test							

LC0076	2359407	441235	441237	441239	441240	441241
Seq. 2 of 2	Part No.	28 May 76	1 Mar 77	15 Jun 79	30 May 80	29 Aug 80

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
XX00		Lost synchronization between the master and the slave.				Reload routine B6. Error Code XX00, valid only on routine B6. See MICFL section.	
XX01		Invalid parameter entered by CE.				See MICRO 20 through 84 for valid parameters.	
XX02		Online Status not present.	2	Drive Status byte xxxx 1xxx Received Expected	DEV-I 410, Entry B		
XX03		No physical address returned from CE drive after selection.	2	Physical drive ID byte Received	DEV-I 104, Entry A	1. Suspect drive not in CE Mode; check CE Mode switch. 2. If not already run, run Linked Series 1 starting with routine A1.	
XX04		HDA is not Write enabled (the R/W or Read switch is not in the R/W position).	2	Checks/Status byte xxxx 1xxx Received Expected	R/W 172, Entry C	Place the R/W or Read switch in the R/W position.	
XX05		Multiple drives selected (1-of-8 Check).	2	Physical drive ID byte	DEV-I 112, Entry A	This error can be caused by more than one drive returning its address on the Attention/Select Bus. Be sure that only one drive is in CE Mode. Note: <i>Byte 2 will indicate physical drives selected.</i>	
XX06		Incorrect device type or microdiagnostic disk/drive feature incompatibility.	2	XXXX XXY = Composite Bus In where X = Bits 0–5 under Tag '0A' Bus '80' and Y = Bits 6 and 7 under Tag '8F' Bus '83' 0000 0111 Received Expected	CTL-I 330, Entry A (3340)		
XX07		HDA sequence error.	2	HDA status 0110 000x Received Expected	HDA 110, Entry A	Make sure the HDA is powered on and Ready.	

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
A001 through A007		Errors common to all routines.			MICRO 89		
A010	1	No Select Active received after Controller Select.	2	x0xx xxxx Received x1xx xxxx Expected	CTL-I 410, Entry B (3340)		
A011	1	Bus In Parity Check in storage control.	2	xx1x xxxx Received xx0x xxxx Expected	PANEL 151, Entry D (3340)		
A012	1	Value read from switches does not equal expected value.	2 3	xxxx xxxx Received xxxx xxxx Expected	PANEL 151, Entry C (3340)		

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
A101 through A107		Errors common to all routines.			MICRO 89		

Error Code	Test No.	Error Description	CE Panel Lamp Display		Analysis Procedure or Possible Failing Units	Additional Action and Reference Notes	Test Flowcharts
			BYTE	DESCRIPTION			
A110	1	CTL-I Bus In contains a non-zero value prior to controller selection.			CTL-I 440 (3340)		
A111	1	Select Active was on prior to controller selection.			CTL-I 410, Entry A (3340)		
A112	1	Tag Valid was received prior to controller selection.			CTL-I 270, Entry C (3340)		
A113	1	Normal End was received prior to controller selection.			CTL-I 260, Entry B (3340)		
A114	1	Check End was received prior to controller selection.			CTL-I 260, Entry B (3340)		
A115	1	Error Alert was received prior to controller selection.			CTL-I 400, Entry A (3340)		
A116	1	Index Alert was received prior to controller selection.			RPI 160, Entry A		
A117	1	Sync In was received prior to controller selection.			DATA 110, Entry A (3340)		

MICRODIAGNOSTIC ERROR CODE DICTIONARY

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Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Referenc
			BYTE	DESCRIPTION			
A120	2	Invalid 3-of-6 code returned.	2	Controller address Received	CTL-I 300, Entry B (3340)	The following chart describes the addresses expected: 3-of-6 code for: Controller Address 0 0000 0111 1 0010 0110 2 0100 0101 3 0110 0100	20
A121	2	Select Active was off following a controller selection.			CTL-I 410, Entry B (3340)		20
A122	2	With a controller selected, Tag Valid was received after dropping Tag Gate.			CTL-I 271, Entry A (3340)		20
A123	2	With a controller selected, Normal End was received without receiving Tag Valid.			CTL-I 260, Entry B (3340)		20
A124	2	With a controller selected, Check End was received.			CTL-I 260, Entry B (3340)		20
A125	2	With a controller selected, Sync In was received.			DATA 110, Entry A (3340)		20
A126	2	With a controller selected, Index Alert was received.			RPI 160, Entry B		20
A127	2	With a controller selected, Error Alert was received.			CTL-I 400, Entry A (3340)		20

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
A130	3	CTL-I Tag Bus Parity error failed to come on after being forced.	2	Bus In under Sense Status for Controller Error 1 Tag '04' Bus '01' 1xxx xxxx Expected	Received Expected CTL-I 371, Entry B (3340)		
A131	3	CTL-I Tag Bus Parity error failed to reset following a Controller Reset.	2	Bus In under Sense Status for Controller Error 1 Tag '04' Bus '01' 0xxx xxxx Expected	Received Expected CTL-I 160, Entry A (3340)		
A132	3	CTL-I Bus Out Parity error failed to come on after being forced.	2	Bus In under Sense Status for Controller Error 1 Tag '04' Bus '01' x1xx xxxx Expected	Received Expected CTL-I 371, Entry A (3340)	CTL-I Bus Out Parity error is forced by: 1. Placing a value on Bus Out. 2. Raising Tag Gate. 3. Changing the value on Bus Out. 4. Dropping Tag Gate.	
A133	3	CTL-I Bus Out Parity error failed to reset following a Controller Reset.	2	Bus In under Sense Status for Controller Error 1 Tag '04' Bus '01' x0xx xxxx Expected	Received Expected CTL-I 160, Entry A (3340)		
A134	3	Error Alert failed to come on after forcing Tag Bus Parity error.			CTL-I 401, Entry A (3340)		
A135	3	Controller Check failed to come on after forcing Tag Bus Parity error.	2	Bus In under Read Status Tag '84' Bus '00' 1xxx xxxx Expected	Received Expected CTL-I 400, Entry C (3340)		
A136	3	Error Alert remained active following a Controller Reset.	2	Bus In under Sense Status for Controller Error 1 Tag '04' Bus '01'	Received CTL-I 161, Entry A (3340)		
A137	3	Controller Check failed to reset following a Controller Reset.	2	Bus In under Read Status Tag '84' Bus '00' 0xxx xxxx Expected	Received Expected CTL-I 160, Entry A (3340)		

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
A138	3	Error Alert failed to come on after forcing Bus Out Parity error.			CTL-I 401, Entry A (3340)		
A139	3	Controller Check failed to come on after forcing Bus Out Parity error.	2	Bus In under Read Status Tag '84' Bus '00' 1xxx xxxx Received Expected	CTL-I 400, Entry C (3340)		
A13A	3	Error Alert remained active following a Controller Reset.	2	Bus In under Sense Status for Controller Error 1 Tag '04' Bus '01' Received	CTL-I 161, Entry A (3340)		
A13B	3	Controller Check failed to reset following a Controller Reset.	2	Bus In under Read Status Tag '84' Bus '00' 0xxx xxxx Received Expected	CTL-I 160, Entry A (3340)		
A13C	3	Tag Bus Parity Check as well as Bus Out Parity Check failed to come on when forced.	2	Bus In under Sense Status for Controller Error 1 Tag '04' Bus '01' Received	CTL-I 160, Entry B (3340)	Suspect that the Reset line is tied down or Bus In Assembler is failing.	

MICRODIAGNOSTIC ERROR CODE DICTIONARY

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
A140	4	Tag Valid was not received for a given controller tag. However, no Tag Bus or Bus Out Parity Checks were detected.	2	Controller tag that failed to give Tag Valid.	CTL-I 271, Entry B (3340)	Bus Out value was zero for all Immediate operation tags, and '20' for all Extended operation tags.	
A141	4	Normal End was not received for a given controller tag. This error applies to Immediate operations.	2	Controller tag that failed to give Normal End.	CTL-I 272, Entry A (3340)	Bus Out value was zero.	
A142	4	Tag Valid was not received for a given controller tag. However, Tag Bus Parity error was detected.	2	Bus In under Sense Status for Controller Error 1 Tag '04' Bus '01' Received	CTL-I 380, Entry E (3340)		
			3	0xxx xxxx Expected			
			4	Failing tag			
A143	4	Tag Valid was not received for a given controller tag. However, Bus Out Parity error was detected.	2	Bus In under Sense Status for Controller Error 1 Tag '04' Bus '01' Received	CTL-I 370, Entry E (3340)		
			3	x0xx xxxx Expected			
			4	Failing tag			
A144	4	Tag Valid was not received for Display CE High tag.			CTL-I 271, Entry C (3340)	Bus Out was set to '8C'.	
A145	4	Normal End was not received for Display CE High tag.			CTL-I 272, Entry B (3340)	Bus Out was set to '8C'.	
A146	4	Tag Valid was not received for Display CE High tag. However, Tag Bus Parity error was detected.	2	Bus In under Sense Status for Controller Error 1 Tag '04' Bus '01' Received 0xxx xxxx Expected	CTL-I 380, Entry E (3340)		
A147	4	Tag Valid was not received for Display CE High tag. However, Bus Out Parity error was detected.	2	Bus In under Sense Status for Controller Error 1 Tag '04' Bus '01' Received x0xx xxxx Expected	CTL-I 370, Entry E (3340)		

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICF Refer
			BYTE	DESCRIPTION			
A148	4	Tag Valid was not received for Display CE Low tag.			CTL-I 271, Entry D (3340)	Bus Out was set to '8C'	
A149	4	Normal End was not received for Tag '0D'.			CTL-I 272, Entry C (3340)		
A14A	4	Tag Valid was not received for Display CE Low tag. However, Tag Bus Parity error was detected.	2	Bus In under Sense Status for Controller Error 1 Tag '04' Bus '01' 0xxx xxxx Received Expected	CTL-I 380, Entry E (3340)		
A14B	4	Tag Valid was not received for Display CE Low tag. However, Bus Out Parity error was detected.	2	Bus In under Sense Status for Controller Error 1 Tag '04' Bus '01' x0xx xxxx Received Expected	CTL-I 370, Entry E (3340)		
A14C	4	Normal End was received for one of the Extended operation tags.	2	Tag that gave Normal End. Received	CTL-I 261, Entry A (3340)		
A14D	4	Monitor Check failed to come on when forced.	2	Bus In under Sense Status for Controller Error 2 Tag '04' Bus '02' xxxx x1xx Received Expected	DATA 221 (3340)		
A14E	4	Monitor Check failed to reset following a Controller General Reset.	2	Bus In under Sense Status for Controller Error 2 Tag '04' Bus '02' xxxx x0xx Received Expected	CTL-I 160, Entry A (3340)		

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
A150	5	Controller Bus In Parity Check failed to come on after being forced.	2	Bus In under Sense Status for Controller Error 1 Tag '04' Bus '01' xxxx 1xxx Received Expected	CTL-I 390, Entry C (3340)		
A151	5	Controller Bus In Parity Check failed to reset following a Controller Reset.	2	Bus In under Sense Status for Controller Error 1 Tag '04' Bus '01' xxxx 0xxx Received Expected	CTL-I 390, Entry B (3340)		
A152	5	Bus In value received was other than '20'.	2	Bus In under Sense Status Tag '04' Bus '00' 0010 0000 Received Expected	CTL-I 450, Entry A (3340)	Either Register Select bit is always active or Lost Orientation bit is always inactive.	
A153	5	Bus In Parity Check in the 3830-2/IFA.			CTL-I 452, Entry A (3340)		
A154	5	Bus In value received was other than '00'.	2	Bus In under Sense Status for Controller Error 1 Tag '04' Bus '01' 0000 0000 Received Expected	CTL-I 454, Entry A (3340)	If the received value is '01', Register Select bit is always active. If the received value is '20', Register Select bit is always inactive.	
A155	5	Bus In value received was other than '00'.	2	Bus In under Sense Status Tag '04' Bus '80' 0000 0000 Received Expected	CTL-I 456, Entry A (3340)	If the received value is 'FF', Register Select bit is always active. If the received value is '20', Register Select bit is always inactive.	
A156	5	Bus In value received was other than '00'.	2	Bus In under Sense Status Tag '04' Bus '40' 0000 0000 Received Expected	CTL-I 456, Entry A (3340)	If the received value is 'FF', Register Select bit is always active. If the received value is '20', Register Select bit is always inactive.	
A157	5	Bus In value received was other than 'FF'.	2	Bus In under Read G1 Tag '0E' Bus '49' 1111 1111 Received Expected	CTL-I 458, Entry A (3340)		

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
A158	5	Bus In value received was other than '80'.	2	Bus In under Read Status Tag '84' Bus '00' 1000 0000 Received Expected	CTL-I 460, Entry A (3340)	If the received value is '20', the Register Select bit is always inactive.	
A1A1	A	False error stop. Microdiagnostic failed to load properly.			PANEL 150 (3340)	See MICRO 12 for diagnostic loading procedures.	

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
A201 through A210		Errors common to all routines			MICRO 89		50
A210	1	Except 3880 Physical address not returned after issuing Select Drive Tag '83' to select a CE drive.	2	Bus In under Sense Status for Physical Address Tag '04' Bus '10' Bus In = 00 Received	DEV-I 104, Entry A	Note: This error can be caused by not having a drive in CE Mode. Tag Valid was returned properly, but not bits were active on the Attention/Select Bus.	50
		3880 Only Tag Valid not received when Select Tag '83' Bus '10' was issued to select a CE drive.			DEV-I 116, Entry B	The conditions that should exist during Tag '83' are: 1. Device Tag Bus should equal 000 with the P bit on. 2. Bus Out bit 3 = 1, bit 4 = 0. 3. Enable functions (No Device Interface, Tag Bus, or Bus Out Parity error). 4. Select Hold from controller.	50
A211	1	Except 3880 Tag Valid not received when Select Tag '83' Bus '10' was issued to select a CE drive.			DEV-I 116, Entry B	The conditions that should exist during Tag '83' are: 1. Device Tag Bus should equal 000 with the P bit on. 2. Bus Out bit 3 = 1, bit 4 = 0. 3. Enable functions (No Device Interface, Tag Bus, or Bus Out Parity error). 4. Select Hold from controller.	50
		3880 Only Physical address not returned after issuing Select Drive Tag '83' to select a CE drive.	2	Bus In under Sense Status for Physical Address Tag '04' Bus '10' Bus In = 00 Received	DEV-I 104, Entry A	Note: This error can be caused by not having a drive in CE Mode. Tag Valid was returned properly, but not bits were active on the Attention/Select Bus.	50
A212	1	File Selection error indication is on (1-of-8 Check).	2	Bus In under Sense Status for Physical Address Tag '04' Bus '10' Received	DEV-I 112, Entry A	This error can be caused by more than one drive returning its address on the Attention/Select Bus. Be sure that no more than one drive is in CE Mode. Display Byte 2 contains the physical address received.	50

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
A213	1	3880 Only Monitor Check found to be on after drive selection.	2	Bus In under Sense Status for Controller Error 2 Tag '04' Bus '02' xxxx x0xx	Received Expected	DATA 220, Entry A (3340 MLM)	105 (3340 MLM)
A214	1	3880 Only Device type received indicates that device is other than 3340 or 3344.	2	Bus In under Read Control Tag '01' Bus '80' 0000 0100	Received Expected	CTL-I 330, Entry B (3340 MLM)	50
A215		Tag Valid was not returned after Device Interface Checks reset.	2	Not used		DEV-I 116, Entry A	50
A216		Tag Valid was not returned with Bus Out Parity Check active.	2	Bus In under Sense Interface Tag '89' Bus '00' xxxx xx0x	Received Expected	DEV-I 124, Entry A	50
A217		Tag Valid was not returned with Tag Bus Parity Check active.	2	Bus In under Sense Interface Tag '89' Bus '00' xxxx xxx0	Received Expected	DEV-I 120, Entry A	50
A218	1	Device type received indicates that device is other than 3340 or 3344.	2	Bus In under Read Control Tag '0A' Bus '80' 0000 0100	Received	CTL-I 330, Entry B (3340 MLM)	50

MICRODIAGNOSTIC ERROR CODE DICTIONARY

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
A230	3	A Device Tag Bus Parity error occurred during Tag '8F' Bus '00'.	2	Bus In under Sense Interface Tag '89' Bus '00' xxxx xxx0 Received Expected	DEV-I 140, Entry A		50
A231	3	A Device Bus Out Parity error occurred during a Set HAR to '01' operation (Tag '8B' Bus Out '01').	2	Bus In under Sense Interface Tag '89' Bus '00' xxxx xx0x Received Expected	DEV-I 150, Entry B		50
A232	3	A Device Bus Out Parity error occurred during a Set HAR to 'FF' operation (Tag '8B' Bus Out 'FF').	2	Bus In under Sense Interface Tag '89' Bus '00' xxxx xx0x Received Expected	DEV-I 150, Entry A		50
A233	3	Active bits on Bus In following a Sense Interface command (Tag '89').	2	Bus In under Sense Interface Tag '89' Bus '00' 0000 0000 Received Expected	DEV-I 170, Entry A	Tag '89' should reset any Device Bus Out or Device Tag Bus Parity error (bits 6 and 7).	50
A234	3	Bus In not equal to Bus Out. Bus Out was set to zero.	2	Bus In under Sense Difference Counter (Tag '8F' Bus '09') or Sense HAR (Tag '8F' Bus '05') 0000 0000 Received Expected	DEV-I 180, Entry A	Both the Difference Counter and HAR are used to transfer the Bus Out value to Bus In. (Both paths failed before the error was indicated.)	50
A235	3	Bus In not equal to Bus Out. Bus Out was set to 'FF'.	2	Bus In under Sense Difference Counter (Tag '8F' Bus '09'), or Sense HAR (Tag '8F' Bus '05') 1111 1111 Received Expected	DEV-I 160, Entry A	Both the Difference Counter and HAR are used to transfer the Bus Out value to Bus In. (Both paths failed before the error was indicated.)	50
A236	3	Bus In not equal to Bus Out. Bus Out value was a sliding 1s pattern (1, 2, 4, 8, 16, 32, 64, 128).	2	Bus In under Sense Difference Counter (Tag '8F' Bus '09'), or Sense HAR (Tag '8F' Bus '05')	DEV-I 160, Entry A	Both the Difference Counter and HAR are used to transfer the Bus Out value to Bus In. (Both paths failed before the error was indicated.) Suspect Enable Register Resets line failed.	50

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
A240	4	Drive physical address was returned while Bus Out bit 4 under Tag '83' was turned on.	2	Bus In under Sense Status for Physical Address Tag '04' Bus '10' 0000 0000 Received Expected	DEV-I 190, Entry A	Device Bus Out bit 4 should block the Attention/Select response, preventing an address bit from being placed on the Attention/Select Bus.	
A241	4	Physical address was not returned for the CE drive.	2	Bus In under Sense Status for Physical Address Tag '04' Bus '10'	DEV-I 104, Entry B		
A242	4	Drive Selection error did not come on when forced. Attempted to select CE drive and one non-CE drive.	2	Bus In under Sense Status for Controller Error 1 Tag '04' Bus '01' xx1x xxxx Received Expected	DEV-I 260, Entry A	For this test to run successfully, the following conditions must be met: 1. One drive in the string must have the CE switch on. 2. All other drives must have the CE Mode latch reset. To reset the CE Mode latch: 1. Be sure that the CE switch is off. 2. Make the drive Ready. 3. Push the Attention button.	

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
A250	5	Tag Valid was not received but Device Tag Bus Parity error was on. This error applies to Tags '84' and '89' through '8F' only.	2	Bus In under Sense Interface Tag '89' Bus '00' xxxx xxx0 Received Expected	DEV-I 140, Entry A		
			3	Not used			
			4	Drive tag causing error			
A251	5	Tag Valid was not received but Device Bus Out Parity error was on. This error applies to Tags '84' and '89' through '8F' only.	2	Bus In under Sense Interface Tag '89' Bus '00' xxxx xx0x Received Expected	DEV-I 150, Entry A		
			3	Not used			
			4	Drive tag causing error			
A252	5	Tag Valid was not received and no Device Tag Bus or Device Bus Out errors was detected. This error applies to Tags '84' and '89' through '8F' only.	2	Failing drive tag	CTL-I 270, Entry E (3340)		
A253	5	Normal End was not received after receiving Tag Valid. This error applies to Tags '84' and '89' through '8F' only.	2	Failing drive tag	CTL-I 270, Entry D (3340)		
A254	5	Interface Check was found to be active following a Set Read/Write.	2	Bus In under Read Status Tag '84' Bus '00' x0xx xxxx Received Expected	DEV-I 200, Entry A		
A255	5	Tag Valid was not received for Set Read/Write Tag '85'.			CTL-I 270, Entry F (3340)		
A256	5	Tag Valid was not received but Device Tag Bus Parity error was on. This error applies to Tag '82' (Poll Device).	2	Bus In under Sense Interface Tag '89' Bus '00' xxxx xxx0 Received Expected	DEV-I 140, Entry A		
			3	Not used			
			4	Drive tag causing error			
A257	5	Tag Valid was not received but Device Bus Out Parity error was on. This error applies to Tag '82' (Poll Device).	2	Bus In under Sense Interface Tag '89' Bus '00' xxxx xx0x Received Expected	DEV-I 150, Entry A		

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
A258	5	Tag Valid was not received for Poll Device Tag '82' without Tag Bus or Bus Out Parity errors.			CTL-I 270, Entry E (3340)		
A259	5	Normal End was not received after receiving Tag Valid. This error applies to Tag '82' only.			CTL-I 270, Entry D (3340)		
A260	6	Tag Valid was received after forcing Tag Bus Parity error. This error applies to Tags '8A' through '8F' only.	2	Failing drive tag	CTL-I 270, Entry B (3340)		
A270	7	Device Bus In Parity error did not come on after being forced.	2	Bus In under Sense Status for Controller Error 1 Tag '04' Bus '01' xxx1 xxxx Received Expected	DEV-I 210, Entry A	The Device Bus In Parity lamp on the CE Panel should be on.	
A271	7	Device Bus In Parity error failed to reset following Controller Reset.	2	Bus In under Sense Status for Controller Error 1 Tag '04' Bus '01' xxx0 xxxx Received Expected	DEV-I 210, Entry A		

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
A272	7	Size bit 6 or 7 is off. Both should be on.	2	Bus In under Sense Status 1 Tag '8F' Bus '83' x000 0011 Expected	DEV-I 280, Entry A	This error occurs if the 3340 is in CE Mode.	50
A273	7	Fixed head bit under Sense HAR failed to set on.	2	Bus In under Sense Status HAR Tag '8F' Bus '05' 0100 0000 Expected	DEV-I 220, Entry B		50
A274	7	Direction bit (Bus In bit 0) under Set Difference High failed to reset by a Tag '8F' Bus '0E' command.	2	Bus In under Sense Status 0 Tag '8F' Bus '03' 0000 0001 Expected	DEV-I 220, Entry A		50
A275	7	Direction bit (Bus In bit 0) under Set Difference High, Tag '8F' Bus '8E', failed to set on.	2	Bus In under Sense Status 0 Tag '8F' Bus '03' 1000 0001 Expected	DEV-I 220, Entry A		50

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
A280	8	Device Bus In Parity error indication came on with Bus In not equal to Bus Out. Bus Out values used by this test are: all 0s, all 1s, sliding 1s pattern, and sliding 2s pattern.	2	Bus In under Sense HAR Tag '8F' Bus '05'	Received	DEV-I 160, Entry B	
			3	Bus Out value			
A281	8	Device Bus In Parity error indication came on with Bus In equal to Bus Out.	2	Bus In under Sense HAR Tag '8F' Bus '05'	Received	DEV-I 160, Entry C	A parity bit may have been picked or dropped. Suspect a malfunction between the Device Bus In Parity Generator in the device and the Parity Checker in the controller.
			3	Bus Out value			
A282	8	Bus In not equal to Bus Out and no Device Bus In Parity error indication. Bus Out value was set to zero.	2	Bus In under Sense HAR Tag '8F' Bus '05'	Received	DEV-I 230, Entry A	A malfunction is in HAR, or Set HAR is always active.
			3	0000 0000			
A283	8	Bus In not equal to Bus Out and no Device Bus In Parity error indication. Bus Out value was set to 'FF'.	2	Bus In under Sense HAR Tag '8F' Bus '05'	Received	DEV-I 230, Entry B	A malfunction is in HAR or Set HAR, or Sense HAR control lines failed to activate.
			3	1111 1111			
A284	8	Bus In not equal to Bus Out and no Device Bus In Parity error indication. Variable values on Bus Out.	2	Bus In under Sense HAR Tag '8F' Bus '05'	Received	DEV-I 230, Entry C	Suspect a malfunction in HAR.
			3	Bus Out value			

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
A290	9	Device Bus In Parity error indication came on with Bus In not equal to Bus Out. Bus Out values used by this test are: all 0s, all 1s, sliding 1s pattern, and sliding 2s pattern.	2	Bus In under Sense Difference Counter Tag '8F' Bus '09' Received	DEV-I 160, Entry B		
			3	Bus Out value Expected			
A291	9	Device Bus In Parity error indication came on with Bus In equal to Bus Out.	2	Bus In under Sense Difference Counter Tag '8F' Bus '09' Received	DEV-I 160, Entry C	A parity bit may have been picked or dropped on Device Bus In. Suspect a malfunction between the Device Bus In Parity Generator in the device and the Device Bus In Parity Checker in the controller.	
			3	Bus Out value Expected			
A292	9	Bus In not equal to Bus Out and no Device Bus In Parity error indication. Bus Out value was set to zero.	2	Bus In under Sense Difference Counter Tag '8F' Bus '09' Received	DEV-I 240, Entry A	A malfunction is in the Difference Counter or Set Difference Counter is always active.	
				0000 0000 Expected			
A293	9	Bus In not equal to Bus Out and no Device Bus In Parity error indication. Bus Out value was set to 'FF'.	2	Bus In under Sense Difference Counter Tag '8F' Bus '09' Received	DEV-I 240, Entry B	A malfunction is in the Difference Counter or the Set Difference Counter, or Sense Difference Counter control lines failed to activate.	
				1111 1111 Expected			
A294	9	Bus In not equal to Bus Out and no Device Bus In Parity error indication. Variable values on Bus Out.	2	Bus In under Sense Difference Counter Tag '8F' Bus '09' Received	DEV-I 240, Entry C	Suspect a malfunction in the Difference Counter.	
			3	Bus Out value Expected			

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
A2A0	A	Bus In not equal to Bus Out (variable Bus Out values).	2	Bus In under Sense Difference Counter Tag '8F' Bus '09' Received	DEV-I 250, Entry A		
			3	Bus Out value Expected			
A2A1	A	The 256 bit in the Difference High Register is reset to zero while the Difference Counter decremented 255 times.	2	Bus In under Sense Status 0 Tag '8F' Bus '03' xx1x xxxx Received Expected	DEV-I 250, Entry B		
A2A2	A	The 256 bit in the Difference High Register failed to reset to zero after the Difference Counter decremented from 256 (Difference High bit 2 on) to 255.	2	Bus In under Sense Status 0 Tag '8F' Bus '03' xx0x xxxx Received Expected	DEV-I 250, Entry B	This error may also be caused by a failure of the Sense Status 0 command.	
A2A3	A	Either Difference Counter 256 or 512 bit failed to set on. Set DH command (Tag '8F' Bus '0E'). DH = Difference High	2	Bus In under Sense Status 0 Tag '8F' Bus '03' 0110 xxxx Received Expected	DEV-I 250, Entry B		
A2A4	A	Either Difference Counter 256 or 512 bit failed to reset. Set DH command (Tag '8F' Bus '0E'). DH = Difference High	2	Bus In under Sense Status 0 Tag '8F' Bus '03' 0000 xxxx Received Expected	DEV-I 250, Entry B		
A2A5	A	Difference Counter 512 did not turn off when decrementing by 1 from count of 512.	2	Bus In under Sense Status 0 Tag '8F' Bus '03' x01x xxxx Received Expected	DEV-I 250, Entry B		
A2A6	A	Difference Counter 256 bit did not set on when decrementing by 1 from count of 512.	2	Bus In under Sense Status 0 Tag '8F' Bus '03' x01x xxxx Received Expected	DEV-I 250, Entry B		

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
A2B0	B	Device Bus In Parity Check. Sense CAR value not equal to Set CAR value.	2	Bus In under Sense CAR Tag '8F' Bus '01'	Received	DEV-I 160, Entry A	
			3	CAR value	Expected		
A2B1	B	Device Bus In Parity Check. Sense CAR value equal to Set CAR value.	2	Bus In under Sense CAR Tag '8F' Bus '01'	Received	DEV-I 160, Entry C	
			3	CAR value	Expected		
A2B2	B	Value set in CAR does not equal value received under Sense CAR and no Device Bus In Parity Check. CAR was set to '00'.	2	Bus In under Sense CAR Tag '8F' Bus '01'	Received	DEV-I 194, Entry A	
				0000 0000	Expected		
A2B3	B	Bus In not equal to 'FF' on Sense CAR. CAR was set to 'FF'.	2	Bus In under Sense CAR Tag '8F' Bus '01'	Received	DEV-I 194, Entry B	
				1111 1111	Expected		
A2B4	B	Value set in CAR does not equal value received under Sense CAR. CAR was set to variable patterns.	2	Bus In under Sense CAR Tag '8F Bus '01'	Received	DEV-I 194, Entry C	
			3	CAR value	Expected		

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
A501 through A507		Errors common to all routines.			MICRO 89		

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
A512	1	Drive Bus In Parity error indication came on with Bus In not equal to Bus Out. Bus Out values used by this test are: all 0s, all 1s, sliding 1s, and sliding 2s pattern.	2	Bus In under Sense Target Tag '8F' Bus '0D' Received	DEV-I 160, Entry B	A parity bit was dropped between the Parity Generator and the controller, or a bad Parity Generator.	130
			3	Bus Out value Expected			
A513	1	Drive Bus In Parity error indication came on with Bus In equal to Bus Out.	2	Bus In under Sense Target Tag '8F' Bus '0D' Received	DEV-I 160, Entry B	A parity bit was picked up between the Parity Generator and the controller.	130
			3	Bus Out value Expected			
A514	1	Bit 0 is always expected to be on.	2	Bus In under Sense Target Tag '8F' Bus '0D' Received	RPI 200, Entry A	Suspect a malfunction in the Target Register or between Bus In and the Parity Generator.	130
			3	Bus Out value Expected			
A515	1	Bit 0 is always expected to be on.	2	Bus In under Sense Target Tag '8F' Bus '0D' Received	RPI 200, Entry B	Suspect a malfunction in the Target Register or between Bus In and the Parity Generator.	130
			3	Bus Out value Expected			
A516	1	Bus In not equal to Bus Out and no Bus In Parity Check. Variable values on Bus Out.	2	Bus In under Sense Target Tag '8F' Bus '0D' Received	RPI 200, Entry C	Suspect a malfunction in the Target Register or between Bus In and the Parity Generator.	130
			3	Bus Out value Expected			
A517	1	Sector Counter value is incorrect (always zero) after a Transfer Sector operation.	2	Bus In under Sense Target Tag '8F' Bus '0D' x111 1111 Received Expected	RPI 232, Entry A		130

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
A520	2	Index Mark was not received in 15 milliseconds.			RPI 120, Entry D		
A521	2	Index Mark pulse width was greater than 24 microseconds.			RPI 120, Entry A		
A522	2	Index Mark pulse width was less than 21 microseconds.			RPI 120, Entry B		
A523	2	Time between two consecutive Index Marks was less than 9.8 milliseconds.			RPI 120, Entry C	Time was based on 10.1 milliseconds ± 3%.	
A524	2	Index Check was active after received Index. Suspect an early Index.	2	Bus In under Sense Read/Write Tag '8F' Bus '0B' xxx0 xxxx Expected	RPI 100, Entry A		
A525	2	Active Track indication does not follow HAR bit 7. Active Track was on at this point.	2	Bus In under Read Status Tag '84' Bus '00' xxxx xxx0 Expected	RPI 150, Entry A		
A526	2	Active Track indication does not follow HAR bit 7. Active Track was off at this point.	2	Bus In under Read Status Tag '84' Bus '00' xxxx xxx1 Expected	RPI 150, Entry A		
A527	2	Active Track indication failed to change states after Index Mark.	2	Bus In under Read Status Tag '84' Bus '00' xxxx xxx0 Expected	RPI 150, Entry A		

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
A528	2	Active Track indication in the controller was on during the time Active Track in the drive was off.	2	Bus In under Sense Status Tag '04' Bus '00' xxxx xxx0 Received Expected	RPI 155, Entry A		
A529	2	Active Track indication in the drive failed to come on in one full revolution.	2	Bus In under Read Status Tag '84' Bus '00' xxxx xxx1 Received Expected	RPI 150, Entry A		
A52A	2	Active Track indication in the controller was off during the time Active Track in the drive was on.	2	Bus In under Sense Status Tag '04' Bus '00' xxxx xxx1 Received Expected	RPI 155, Entry A		
A52B	2	Time between two consecutive Index Marks is greater than 10.4 milliseconds.			RPI 120, Entry E		
A530	3	Multichip Check failed to come on after being forced.	2	Bus In under Sense Read/Write Tag '8F' Bus '0B' 1xxx xxxx Received Expected	R/W 182, Entry A		
A531	3	Read/Write Check failed to come on after forcing a Multichip Check.	2	Bus In under Read Status Tag '84' Bus '00' xxx1 xxxx Received Expected	R/W 112, Entry A		
A532	3	Error Alert was not active after detecting a Read/Write Check.			DATA 150 (3340)		
A533	3	Multichip Check failed to reset following a Read/Write Check Reset.	2	Bus In under Sense Read/Write Tag '8F' Bus '0B' 0xxx xxxx Received Expected	R/W 182, Entry B		
A534	3	Read/Write Check failed to reset following a Read/Write Check Reset.	2	Bus In under Read Status Tag '84' Bus '00' xxx0 xxxx Received Expected	R/W 112, Entry C		

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
A537	3	Multichip Check active following a Check Reset operation.	2	Bus In under Sense Read/Write Tag '8F' Bus '0B' 0xxx xxxx Expected Received	R/W 182, Entry B		130
A538	3	Read/Write Check active following a Check Reset operation.	2	Bus In under Read Status Tag '84' Bus '00' xx0x xxxx Expected Received	R/W 112, Entry B		130

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
A540	4	Index Mark was not received in 15 milliseconds.			RPI 120, Entry D		
A541	4	Active Track indication in the drive failed to go off in one full revolution.	2	Bus In under Diagnostic Set Read/Write Tag '8F' Bus '07'	Received	RPI 150, Entry A	
				xxxx xxx0			
A542	4	Failed to detect Sector Compare Check after being forced.	2	Bus In under Drive Check/Status Tag '8F' Bus '83'	Received	RPI 300, Entry C	
				x1xx xxxx			
A543	4	Failed to detect Drive Check after forcing Sector Compare Check.	2	Bus In under Read Status Tag '84' Bus '00'	Received	RPI 300, Entry D	
				xx1x xxxx			
A544	4	Failed to receive an Attention when Polling Device after forcing a Sector Compare Check.	2	Bus In under Poll Service Device Tag '82' Bus 'x4'	Received	DEV-I 270, Entry C	
				1xxx xxxx			
A545	4	Sector Compare Attention failed to reset following an Attention Reset.	2	Bus In under Poll Service Device Tag '82' Bus 'x4'	Received	DEV-I 270, Entry D	
				0xxx xxxx			
A546	4	Sector Compare Check failed to reset following a Check Reset after being forced on.	2	Bus In under Drive Check/Status Tag '8F' Bus '83'	Received	RPI 300, Entry B	
				x0xx xxxx			
A547	4	Drive Check failed to reset following Check Reset.	2	Bus In under Read Status Tag '84' Bus '00'	Received	RPI 300, Entry E	
				xx0x xxxx			
A548	4	Sector Compare Check bit failed to reset following initial Check Reset.	2	Bus In under Drive Check/Status Tag '8F' Bus '83'	Received	RPI 300, Entry B	
				x0xx xxxx			

MICRODIAGNOSTIC ERROR CODE DICTIONARY

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
A550	5	Index Mark was not received in 15 milliseconds.			RPI 120, Entry D		130
A551	5	Active Track indication in the drive failed to change states in one full revolution.	2	Bus In under Diagnostic Set Read/Write Tag '8F' Bus '07' xxxx xxx1	Received Expected	RPI 150, Entry A	130
A552	5	Failed to receive Search Sector after issuing a Set Target command.	2	Bus In under Read Status Tag '84' Bus '00' xxxx xxx1	Received Expected	RPI 225, Entry A	130
A553	5	Busy Attention was active after receiving Sector Compare Attention for Sector Zero.	2	Bus In under Read Status Tag '84' Bus '00' xxxx xx0x	Received Expected	RPI 300, Entry A	130
A554	5	Failed to receive Sector Compare Attention when Polling Device.	2	Bus In under Poll Service Device Tag '82' Bus 'x4' 1xxx xxxx	Received Expected	DEV-I 270, Entry C	130
A555	5	Sector Compare Attention failed to reset following an Attention Reset.	2	Bus In under Poll Service Device Tag '82' Bus 'x4' 0xxx xxxx	Received Expected	DEV-I 270, Entry D	130
A556	5	Failed to receive Busy Attention following a Set Target command.	2	Bus In under Read Status Tag '84' Bus '00' xxxx xx1x	Received Expected	RPI 200, Entry D	130
A557	5	Search Sector failed to reset following an Attention Reset command.	2	Bus In under Read Status Tag '84' Bus '00' xxxx xxx0	Received Expected	RPI 200, Entry E	130

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
A558	5	Busy Attention failed to reset following an Attention Reset.	2	Bus In under Read Status Tag '84' Bus '00' xxxx xx0x Received Expected	RPI 200, Entry F		

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
A560	6	Index Mark was not received in 15 milliseconds.			RPI 120, Entry D		130
A561	6	Active Track indication in the drive failed to change states in one full revolution.	2	Bus In under Diagnostic Set Read/Write Tag '8F' Bus '07' xxxx xxx1 Received Expected	RPI 150, Entry A		130
A562	6	Failed to receive Sector Compare in over 25 milliseconds after initiating a Search Sector operation.	2	Sector that failed to give Sector Compare	RPI 236, Entry E		130
A563	6	Sector Compare duration was greater than 163 microseconds (based on 158 + 3% tolerance).	2	Failing Sector	RPI 236, Entry C		130
A564	6	Sector Compare duration was less than 153 microseconds (based on 158 - 3% tolerance).	2	Failing Sector	RPI 236, Entry D		130
A565	6	Target Register failed to reset to zero.	2	Bus In under Sense Target Tag '8F' Bus '0D' 0000 0000 Received Expected	RPI 200, Entry A		130
A566	6	Bus In from Sense Target operation is not equal to 127 after transferring the Sector Counter to the Target Register during Sector 127 time.	2	Bus In under Sense Target Tag '8F' Bus '0D' 1111 1111 Received Expected Only bits 1-7 are tested for 127. Bit 0 is RPS bit.	RPI 236, Entry A		130
A567	6	Bus In from Sense Target operation is not equal to zero after transferring Sector Counter to the Target Register during Sector Zero time.	2	Bus In under Sense Target Tag '8F' Bus '0D' 1000 0000 Received Expected Only bits 1-7 are tested for zero. Bit 0 is RPS bit.	RPI 236, Entry B		130

MICRODIAGNOSTIC ERROR CODE DICTIONARY

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
A701 through A707		Errors common to all routines.			MICRO 89		

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
A710	1	Sense Status 2 not equal to '6x' with HDA loaded.	2	HDA Sequence Status xxxx xxxx Received 0110 000x Expected	HDA 100, Entry E	The HDA load sequencer does not indicate normal loaded status. Be sure the HDA is loaded on drive.	
A721	2	Adjustment out of specification. Servo Seek velocity too fast (fine measurement).	2	Amount under specification in microseconds (Hex numbers displayed)	ACC 800, Entry C		
A722	2	Adjustment out of specification. Servo Seek velocity too slow (fine measurement). (Adjustment mode.)	2	Amount over specification in microseconds (Hex number displayed)	ACC 800, Entry C		
A723	2	Failed to get Busy status on a Rezero or Seek command.	2	Drive Status byte xxxx xx0x Received xxxx xx1x Expected	ACC 210, Entry C		
A724	2	Access Timeout Check during a Seek command.	2	Access Status 4 byte Received	ACC 510, Entry A	The timeout error occurred while the program was measuring the Seek velocity. Refer to MAP for failure analysis.	
A725	2	Access Timeout and/or Overshoot Check during a Seek command.	2	Access Status 000x xxxx Received Expected	ACC 510, Entry A	The velocity gain fine adjustment is within specification. Refer to MAP for failure analysis.	
A726	2	Access Timeout Check and/or Overshoot Check during a Rezero command.	2	Access Status 000x xxxx Received Expected	ACC 301, Entry A	Reload routine A7 in adjustment mode. See MICRO 24 for parameter required to run in adjustment mode. If error persists, refer to MAP for problem analysis.	
A727	2	Timeout waiting for track-crossing transitions on a Seek Start command.			ACC 521, Entry B		

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
A901 through A907		Errors common to all routines.			MICRO 89		

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
A990		Device Tag Bus Parity error was on upon entry into this routine.	2	Bus In under Sense Interface Tag '89' Bus '00' xxxx xx0	Received Expected	DEV-I 120, Entry A	
A991		Device Bus Out Parity error was on upon entry into this routine.	2	Bus In under Sense Interface Tag '89' Bus '00' xxxx xx0x	Received Expected	DEV-I 124, Entry A	
A992		The received physical address bytes of the Home Address do not match the expected.	2 3 4 5 6	Not used PA1} PA2} PA1} PA2}	Received Expected	ACC 501, Entry A PA1 is the Low Cylinder Address (CCCC CCCC). PA2 is the High Cylinder Address (0X00 0000) where X = 256 bit. Note that physical head 0 is used to read the Home Address.	
A993		Microprogram timed-out waiting for a response from the controller during a Read G1 operation.				Run routine AD.	
A994		Busy status was not received following a Rezero or Seek Start command.	2	Bus In under Read Status Tag '84' Bus '00' xxxx xx1x	Received Expected	ACC 210, Entry C	
A995		Drive Check was active after receiving Seek Complete from a Rezero operation.	2	Bus In under Access Status Tag '8F' Bus '13'	Received	ACC 301, Entry A	
A996		Access Timeout and/or Overshoot Check or Servo Off Track error were on after receiving Seek Complete from a Seek operation.	2	Bus In under Access Status Tag '8F' Bus '13' 000x xxxx	Received Expected	ACC 510, Entry A	
A997		Error Alert was active following a Set Read/Write or Read G1 command.				Run routine B3. Display the Fault Symptom Code and refer to the FSI.	

MICRODIAGNOSTIC ERROR CODE DICTIONARY

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
A998		Normal End was not received for a Set Read/Write or Read G1 command.			CTL-I 260, Entry B (3340)		
A999		Check End was active following a Read G1.	2	Bus In under Check End Received	CTL-I 210, Entry A (3340)		

MICRODIAGNOSTIC ERROR CODE DICTIONARY

AA CYLINDER SEEK TEST **MICRO 504**

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
AA01 through AA07		Errors common to all routines.			MICRO 89		

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
AAA0	1	Device Tag Bus Parity error was on upon entry into this routine.	2	Bus In under Sense Interface Tag '89' Bus '00' xxxx xx0 Received Expected	DEV-I 120, Entry A		
AAA1	1	Device Bus Out Parity error was on upon entry into this routine.	2	Bus In under Sense Interface Tag '89' Bus '00' xxxx xx0x Received Expected	DEV-I 124, Entry A		
AAA2	1	Received physical bytes of the Home Address do not match the expected.	2 3 4 5 6	Not used PA1 } PA2 } PA1 } PA2 } Received Expected	ACC 501, Entry A	PA1 is the Low Cylinder Address (CCCC CCCC). PA2 is the High Cylinder Address (0X0H HHHH) where X = 256 Bit, H = physical head.	
AAA3	1	Microprogram timed-out waiting for a response from the controller during a Read G1 operation.				Run routine AD.	
AAA4	1	Busy status was not received following a Rezero command.	2	Bus In under Read Status Tag '84' Bus '00' xxxx xx1x Received Expected	ACC 210, Entry C		
AAA5	1	Drive Check was active after receiving Seek Complete from a Rezero operation.	2	Bus In under Access Status Tag '8F' Bus '13' 000x xxxx Received Expected	ACC 301, Entry A		
AAA6	1	Access Timeout and/or Overshoot Check or Servo Off Track error were active after receiving Seek Complete from a Seek operation.	2	Bus In under Access Status Tag '8F' Bus '13' 00xx xxxx Received Expected	ACC 510, Entry A		
AAA7	1	Error Alert was active following a Set Read/Write or Read G1 command.				Display the Fault Symptom Code and refer to the FSI.	

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
AAA8	1	Normal End was not received for a Set Read/Write or Read G1 command.			CTL-I 280, Entry B (3340)		
AAA9	1	Check End was active following a Read G1 command.	2	Bus In under Check End Received	CTL-I 210, Entry A (3340)		
AAAA	1	Cylinder address selected by the CE was found to be greater than 560 (decimal).					
AAAB	1	Invalid head was selected by the CE.				See the chart on MICRO 28 for valid heads for each HDA.	
AAAC	1	Head selected in the "from HAR data" does not match that in the "to HAR data" or vice versa.					

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
AB01 through AB07		Errors common to all routines.			MICRO 89	Make sure the HDA is loaded on the CE drive and a CE Mode switch is on.	
ABB0		Device Tag Bus Parity error was on upon entry into this routine.	2	Bus In under Sense Interface Tag '89' Bus '00' xxxx xxx0 Expected	DEV-I 120, Entry A		
ABB1		Device Bus Out Parity error was on upon entry into this routine.	2	Bus In under Sense Interface Tag '89' Bus '00' xxxx xx0x Expected	DEV-I 124, Entry A		
ABB2		The received physical address bytes of the Home Address do not match the expected.	2 3 4 5 6 7 8	Not used PA1 } PA2 } PA1 } PA2 } PA1 } PA2 } Previous Physical Cylinder Address	ACC 501, Entry A	PA1 = Low Cylinder Address (CCCC CCCC). PA2 = High Cylinder Address (0X00 0000) where X=256 Bit. Note that physical head 0 is used to read the Home Address.	
ABB3		Microprogram timed-out waiting for a response from the controller during a Read G1 operation.				Run routine AD.	

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
ABB4		Busy status was not received following a Rezero command.	2	Bus In under Read Status Tag '84' Bus '00' xxxx xx1x Received Expected	ACC 210, Entry C		
ABB5		Drive Check was active after receiving Seek Complete from a Rezero operation.	2	Bus In under Access Status Tag '8F' Bus '13' 000x xxx1 Received Expected	ACC 301, Entry A		
ABB6		Access Timeout and/or Overshoot Check or Servo Off Track error were on after receiving Seek Complete from a Seek operation.	2	Bus In under Access Status Tag '8F' Bus '13' Received	ACC 510, Entry A		
ABB7		Error Alert was active following a Set Read/Write or Read G1 command.				Run routine B3. Display the Fault Symptom Code and refer to the FSI.	
ABB8		Normal End was not received for a Set Read/Write or Read G1 command.			CTL-I 260, Entry B (3340)		
ABB9		Check End was active following a Read G1.	2	Bus In under Check End Received	CTL-I 210, Entry A (3340)		

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
AD01 through AD07		Errors common to all routines.			MICRO 89		

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
AD08	ANY	Failed to raise Busy after a Rezero Start.	2	Bus In under Read Status Tag '84' Bus '00' xxxx xxxx xxxx xx1x Received Expected	ACC 210, Entry C	Test numbers indicated by ANY refer to pre-test initialization which precedes the execution of the first test. To loop these errors, any test number ('01' – '08') may be selected.	
AD09	ANY	Failed to raise Busy after a Seek Start.	2	Bus In under Read Status Tag '84' Bus '00' xxxx xxxx xxxx xx1x Received Expected	ACC 210, Entry C	Test numbers indicated by ANY refer to pre-test initialization which precedes the execution of the first test. To loop these errors, any test number ('01' – '08') may be selected.	
AD0A	ANY	Incorrect status following a Rezero operation.	2	Bus In under Read Status Tag '84' Bus '00' xxxx xxxx xx0x xx01 Received Expected		Expected Not Busy, Not Drive Check, and Seek Complete. Run routine B3. Display the Fault Symptom Code and refer to the FSI. Test numbers indicated by ANY refer to pre-test initialization which precedes the execution of the first test. To loop these errors, any test number ('01' – '08') may be selected.	
AD0B	ANY	Incorrect status following a Seek operation.	2	Bus In under Read Status Tag '84' Bus '00' xxxx xxxx xx0x xx01 Received Expected	ACC 540, Entry B	Expected Not Busy, Not Drive Check, and Seek Complete. Run routine B3. Display the Fault Symptom Code and refer to the FSI. Test numbers indicated by ANY refer to pre-test initialization which precedes the execution of the first test. To loop these errors, any test number ('01' – '08') may be selected.	
AD0C	ANY	Failed to receive Normal End following a Set Read/Write operation.			CTL-I 260, Entry B (3340)	Expected Normal End. Test numbers indicated by ANY refer to pre-test initialization which precedes the execution of the first test. To loop these errors, any test number ('01' – '08') may be selected.	
AD0D	ANY	Failed to orient on Index and Active Track within 21 milliseconds.			RPI 150, Entry B	Expected Index and Active Track (bits 6, 7) from Read Status operation. Test numbers indicated by ANY refer to pre-test initialization which precedes the execution of the first test. To loop these errors, any test number ('01' – '08') may be selected.	
AD0E	ANY	Received Error Alert from a Set Read/Write operation.				Run routine B3. Display the Fault Symptom Code and refer to the FSI. Test numbers indicated by ANY refer to pre-test initialization which precedes the execution of the first test. To loop these errors, any test number ('01' – '08') may be selected.	
AD0F	ANY	Received Error Alert from a Seek operation.				Run routine B3. Display the Fault Symptom Code and refer to the FSI. Test numbers indicated by ANY refer to pre-test initialization which precedes the execution of the first test. To loop these errors, any test number ('01' – '08') may be selected.	

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
AD12	1	Unexpected Attention Status received.	2	Bus In under Read Status Tag '84' Bus '00' xxxx xxxx xxxx x0xx Received Expected		Indicates unexpected access mechanism movement since last Seek operation. Reload routine AD.	240
AD13	1	Received I Write Sense = 1 following a Set Read/Write operation and prior to initiating any Write.	2	Bus In under Read Status Tag '84' Bus '00' xxxx xxxx xxxx x000 Received Expected	DATA 121, Entry A (3340)		240
AD14	1	Failed to orient on Index and Active Track within 21 milliseconds.			RPI 150, Entry B	Expected Index and Active Track (bits 6, 7) from Read operation.	240
AD15	1	Failed to receive I Write Sense = 1 during a Write G1 operation, approximately 20 microseconds after Index.	2	Bus In under Read Status Tag '84' Bus '00' xxxx xxxx xxxx x1xx Received Expected	DATA 120, Entry A (3340)	This error occurred on the CE cylinder ('0230'), head 0 and odd Index.	240
AD16	1	Received I Write Sense = 1 during a Write G1 operation with Diagnostic Inhibit Write Gate mode active approximately 20 microseconds after Index.	2	Bus In under Read Status Tag '84' Bus '00' xxxx xxxx xxxx x0xx Received Expected	DATA 121, Entry B (3340)		240
AD17	1	No Check End or Normal End response received following a Write G1 operation in Diagnositc Invert Bus Out Parity mode within 21 milliseconds.			CTL-I 260, Entry B (3340)		240

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
AD18	1	Unable to force Gap Counter error in Diagnostic Invert Bus Out Parity mode.	2	Bus In under Sense Status for Controller Error 2 Tag '04' Bus '02' xxx0 xxxx	Received	DATA 240, Entry C (3340)	
				xxx1 xxxx	Expected		
			3	Check End byte xxxx xxxx	Received		
AD19	1	Gap Counter error is on when it should be off.	2	Bus In under Sense Status for Controller Error 2 Tag '04' Bus '02' xxx1 xxxx	Received	DATA 240, Entry A (3340)	
				xxx0 xxxx	Expected		
AD1A	1	No Write Data Check in Diagnostic Invert Bus Out Parity mode.	2	Bus In under Sense Status for Controller Error 2 Tag '04' Bus '02' xxxx 0xxx	Received	DATA 230, Entry B (3340)	
				xxxx 1xxx	Expected		
AD1B	1	No Controller error as a result of Gap Counter error in Diagnostic Invert Bus Out Parity mode.	2	Bus In under Read Status Tag '84' Bus '00' 0xxx xxxx	Received	CTL-I 400, Entry C (3340)	
				1xxx xxxx	Expected		
AD1C	1	Controller Reset did not reset Gap Counter error.	2	Bus In under Sense Status for Controller Error 2 Tag '04' Bus '02' xxx1 xxxx	Received	CTL-I 160, Entry A (3340)	
				xxx0 xxxx	Expected		

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
AD22	2	Unexpected Attention Status received.	2	Bus In under Read Status Tag '84' Bus'00' xxxx xxxx xxxx x000 Received Expected		Indicates unexpected access mechanism movement since last Seek operation. Reload routine AD.	240
AD24	2	Failed to orient on Index and Not Active Track.			RPI 150, Entry B		240
AD25	2	Failed to orient on Index (presumed Active Track).			RPI 150, Entry B		240
AD26	2	Microprogram timed-out waiting for a response from the controller during a Read G1 operation.			DATA 113 (3340)		240
AD27	2	Abnormal End condition received while timing a G1 gap in Write mode.	2	Check End byte xxxx xxxx Received	CTL-I 210, Entry A (3340)		240
AD28	2	G1 gap length out of tolerance.	2	Gap timer – Hi xxxx xxxx	DATA 241 (3340)	Bytes 2 and 3 are a 2-byte timer, indicating the measured G1 gap length in microseconds. Expected timer value is 114 to 121 microseconds ('0072' – '0079').	240
			3	Gap timer – Lo xxxx xxxx			

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
AD32	3	Unexpected Attention Status received.	2	Bus In under Read Status Tag '84' Bus '00' xxxx xxxx xxxx x000 Received Expected		Indicates unexpected access mechanism movement since last Seek operation. Reload routine AD.	
AD34	3	Failed to orient on Index and Not Active Track.			RPI 150, Entry B		
AD35	3	Failed to orient on Index Alert.			RPI 160, Entry C		
AD36	3	No Sync In received within 21 milliseconds during an extended G1 operation.			DATA 240, Entry A (3340)		
AD37	3	Abnormal End condition received while timing an extended G1 gap in Write Mode.	2	Check End byte xxxx xxxx 0000 0000 Received Expected	CTL-I 210, Entry A (3340)		
AD38	3	Extended G1 gap out of tolerance.	2	Gap timer – Hi xxxx xxxx	DATA 241 (3340)	Bytes 2 and 3 are a 2-byte timer, indicating the measured extended G1 gap in microseconds. Expected timer value is 253 to 269 microseconds ('00FD' – '010D').	
			3	Gap timer – Lo xxxx xxxx			

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
AD42	4	Unexpected Attention Status received.	2	Bus In under Read Status Tag '84' Bus '00' xxxx xxxx xxxx x000 Received Expected		Indicates unexpected access mechanism movement since last Seek operation. Reload routine AD.	
AD44	4	Failed to orient on Index and Not Active Track.			RPI 150, Entry B		
AD46	4	Failed to receive any End response following a Write G1 operation.			CTL-I 260, Entry B (3340)		
AD48	4	Incorrect number of Sync Ins received after a Write G1 operation of 'nn' bytes.	2	Number of Sync Ins xxxx xxxx Received	DATA 100, Entry A (3340)	'nn' = Number of bytes written. Values are: '01', '02', '04', '08', or '11'. The number of Sync Ins expected is: '02', '03', '05', '09', or '12'.	
			3	xxxx xxxx Expected			

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
AD52	5	Unexpected Attention Status received.	2	Bus In under Read Status Tag '84' Bus '00' xxxx xxxx xxxx x000 Received Expected		Indicates unexpected access mechanism movement since last Seek operation. Reload routine AD.	
AD53	5	No End response received from a Write G1 operation within 21 milliseconds.		Not used	CTL-I 260, Entry B (3340)		
AD54	5	Failed to orient on Index and Not Active Track.		Not used	RPI 150, Entry B		
AD56	5	No Sync In received from a Write G2 following a successful orientation with a Write G1 operation.		Not used	DATA 113 (3340)		
AD57	5	Abnormal End received while timing a G2 gap in Write mode.	2	Check End byte xxxx xxxx 0000 0000 Received Expected	CTL-I 210, Entry A (3340)		
AD58	5	G2 gap out of tolerance.	2	Gap timer – Hi xxxx xxxx	DATA 241 (3340)	Bytes 2 and 3 are a 2-byte timer indicating the measured G2 gap in microseconds. Expected timer value is 72 to 79 microseconds ('0048' – '004F').	
			3	Gap timer – Lo xxxx xxxx			

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
AD62	6	Unexpected Attention Status received.	2	Bus In under Read Status Tag '84 ' Bus '00' xxxx xxxx xxxx x000	Received Expected	Indicates unexpected access mechanism movement since last Seek operation. Reload routine AD.	
AD63	6	No End response received from a Write G1 operation within 21 milliseconds.			CTL-I 260, Entry B (3340)		
AD64	6	Failed to orient on Index and Not Active Track.			RPI 150, Entry B		
AD66	6	Microprogram timed-out waiting for a response from the controller during a Write G3 operation.			DATA 113 (3340)		
AD67	6	Abnormal End received while timing a G3 gap in Write mode.	2	Check End byte xxxx xxxx 0000 0000	Received Expected	CTL-I 210, Entry A (3340)	
AD68	6	G3 gap out of tolerance.	2	Gap timer – Hi xxxx xxxx		DATA 241 (3340)	Bytes 2 and 3 are a 2-byte timer indicating the measured G3 gap in microseconds. Expected timer value is 76 to 82 microseconds ('004C' – '0052').
			3	Gap timer – Lo xxxx xxxx			

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
AD72	7	Unexpected Attention Status received.	2	Bus In under Read Status Tag '84' Bus '00' xxxx xxxx xxxx x000 Received Expected		Indicates unexpected access mechanism movement since last Seek operation. Reload routine AD.	
AD73	7	No End response from a Write G1 operation within 21 milliseconds.			CTL-I 260, Entry B (3340)	Expected Check End or Normal End response to a Write G1 operation. Wrote 4-byte data pattern = 'EB 6D B6 DB'.	
AD74	7	Failed to orient on Index and Not Active Track.			RPI 150, Entry B		
AD76	7	Microprogram timed-out waiting for a response from the controller during a Write G1 operation.			DATA 113 (3340)		

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
AD78	7	Write Data Check and/or ECC Data Check received from a Write G1 operation with data field = 'EB 6D B6 DB'.	2	Controller Checks xxxx xxxx xxxx 0x0x Received Expected	DATA 230, Entry D (3340)		
AD79	7	Unexpected End response received from a Write G1 operation during Data Response mode.	2	Check End byte xxxx xxxx 0000 0000 Received Expected	CTL-I 260, Entry B (3340)		

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
AD81	8	Unexpected Attention Status received.	2	Bus In under Read Status Tag '84' Bus '00' Bits 5,6,7 = 000 Expected	Received	Indicates unexpected access mechanism movement since last Seek operation. Reload routine AD.	240
AD82	8	Read/Write Check (bit 3) not = 0 following a Check Reset operation.	2	Bus In under Read Status Tag '84' Bus '00' Bit 3 = 0 Expected	Received		240
AD84	8	Control Check not = 1 after being forced.	2	Bus In under Sense Read/Write Tag '8F' Bus '0B' Bit 5 = 1 Expected	Received		240
AD85	8	Control Check not = 0 following a Check Reset operation.	2	Bus In under Sense Read/Write Tag '8F' Bus '0B' Bit 5 = 0 Expected	Received		240
AD86	8	Write Overrun Check not = 1 after being forced by writing through Index.	2	Bus In under Sense Read/Write Tag '8F' Bus '0B' Bit 2 = 1 Expected	Received	This error may be caused by the drive motor running too fast.	240
AD87	8	Write Overrun Check not = 0 following a Check Reset operation.	2	Bus In under Sense Read/Write Tag '8F' Bus '0B' Bit 2 = 0 Expected	Received		240

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
AD88	8	Transition Check not = 1 after being forced.	2	Bus In under Sense Read/Write Tag '8F' Bus '0B' Bit 6 = 1 Received Expected	R/W 124, Entry A		240
AD89	8	Transition Check not = 0 following a Check Reset operation.	2	Bus In under Sense Read/Write Tag '8F' Bus '0B' Bit 6 = 0 Received Expected	R/W 124, Entry B		240
AD8A	8	Write I on Read Checks not = 1 after being forced.	2	Bus In under Sense Read/Write Tag '8F' Bus '0B' Bit 7 = 1 Received Expected	R/W 132, Entry A		240
AD8B	8	Write I on Read Checks not = 0 following a Check Reset operation.	2	Bus In under Sense Read/Write Tag '8F' Bus '0B' Bit 7 = 0 Received Expected	R/W 132, Entry B		240
AD8C	8	Read/Write Check not = 1 after forcing Control Check.	2	Bus In under Sense Read/Write Tag '84' Bus '00' Bit 3 = 1 Received Expected	R/W 112, Entry A		240
AD8D	8	Read/Write Check not = 1 after forcing Write Overrun Check.	2	Bus In under Sense Read/Write Tag '84' Bus '00' Bit 3 = 1 Received Expected	R/W 112, Entry A		240
AD8E	8	Read/Write Check not = 1 after forcing Transition Check and Write I Check.	2	Bus In under Sense Read/Write Tag '84' Bus '00' Bit 3 = 1 Received Expected	R/W 112, Entry A		240

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
AD8F	8	Read/Write Check not = 1 after forcing Write I Check.	2	Bus In under Read Status Tag '84' Bus '00' xxx1 xxxx Received Expected	R/W 112, Entry A		

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
AD90	9	Drive Check active on program entry. Test is aborted.	2	Bus In under Read Status Tag '84' Bus '00' xx0x xxxx Received Expected		Reload routine AD.	
AD91	9	Unexpected Attention status received. Indicates unexpected access mechanism movement since the last Seek.	2	Bus In under Read Status Tag '84' Bus '00' xxxx x00x Received Expected		Reload routine AD.	
AD93	9	Read/Write Check active following a Check Reset.	2	Bus In under Read Status Tag '84' Bus '00' xxx0 xxxx Received Expected	R/W 112, Entry B		
AD94	9	Read/Write Check is not active after forcing a Head Short Check.	2	Bus In under Read Status Tag '84' Bus '00' xxx1 xxxx Received Expected	R/W 112, Entry A		
AD95	9	Read/Write Check is not active following a Delta I Write Check.	2	Bus In under Read Status Tag '84' Bus '00' xxx1 xx00 Received Expected	R/W 112, Entry A		
AD97	9	Read/Write Check is not reset following a Check Reset after Head Short Check or Delta I Write Check was reset.	2	Bus In under Read Status Tag '84' Bus '00' xxx0 xxxx Received Expected	R/W 112, Entry B		
AD98	9	Head Short Check is not active after being forced.	2	Bus In under Sense Status 0 Tag '8F' Bus '03' xxxx 1xxx Received Expected	R/W 202, Entry A		
AD99	9	Head Short Check is not reset following a Check Reset.	2	Bus In under Sense Status 0 Tag '8F' Bus '03' xxxx 0xxx Received Expected	R/W 202, Entry B		

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
AD9A	9	Head Short Check is not reset following a Check Reset.	2	Bus In under Sense Status 0 Tag '8F' Bus '03' xxxx 0xxx Received Expected	R/W 202, Entry B		
AD9B	9	Delta I Write Check.	2	Bus In under Sense Read/Write Tag '8F' Bus '0B' xxxx 0xxx Received Expected	R/W 150, Entry A		
AD9C	9	Delta I Write Check is active following a Check Reset.	2	Bus In under Sense Read/Write Tag '8F' Bus '0B' xxxx 0xxx Received Expected	R/W 152, Entry B		
AD9D	9	Delta I Write Check is not active after being forced.	2	Bus In under Sense Read/Write Tag '8F' Bus '0B' xxxx 1xxx Received Expected	R/W 152, Entry A		
AD9E	9	Delta I Write Check is not reset following a Check Reset after being forced.	2	Bus In under Sense Read/Write Tag '8F' Bus '0B' xxxx 0xxx Received Expected	R/W 152, Entry B		
AD9F	9	Failure to orient on Index Alert within 25 milliseconds.	2		RPI 160, Entry C		

MICRODIAGNOSTIC ERROR CODE DICTIONARY

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
AE01 through AE07		Errors common to all routines.			MICRO 89		
AE10	1	ECC Zeros Detect was off after G1 Gap Byte 53 time. The ECC Reset line should be raised to reset the registers at this time.	2	Controller Checks xxxx xxx1 Received Expected	DATA 205 (3340)	No ECC Reset. No serial data to ECC required. Uses Zero Compare to set Zeros Detect.	
AE11	1	ECC Zeros Detect was on after the program received the fourth Sync In. ECC registers should be loaded with data at this time.	2	Controller Checks xxxx xxx0 Received Expected	DATA 205 (3340)	This error could occur if the Home Address read contained zeros in the first 4 bytes.	

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
AE20	2	Bus In at Normal End was not '00'.	2	Bus In under Normal End Received	DATA 180 (3340)		
AE21	2	ECC Low pattern register not equal to zero.	2	ECC Low Received	DATA 210, Entry A (3340)		
				0000 0000 Expected			
AE22	2	ECC High pattern register not equal to zero.	2	ECC High Received	DATA 210, Entry A (3340)		
				0000 0000 Expected			
AE23	2	ECC Zeros Detect was off.	2	Controller Checks Received	DATA 205 (3340)		
				xxxx xxx1 Expected			
AE24	2	ECC Data Check was on after pattern was read back.	2	Bus In under Check End Received	DATA 205 (3340)		

MICRODIAGNOSTIC ERROR CODE DICTIONARY

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
AE30	3	No Check End received after forcing a Data Check.	2	Bus In Received	DATA 207, Entry A (3340)		
AE31	3	Bus In bit 3 (Data Check) is missing.	2	Bus In under Check End Received	DATA 207, Entry B (3340)		
				xxx1 xxxx Expected			
AE32	3	No AM Found bit should be on with ECC Data Check bit.	2	Bus In under Check End Received	DATA 207, Entry D (3340)		
				xxxx 1xxx Expected			
AE33	3	After the correction operation, the data was indicated as uncorrectable. (Normal End came on.)			DATA 205 (3340)		
AE34	3	Incorrect counter value after a correction. Expected '00'.	2	Counter high	DATA 205 (3340)		
			3	Counter low			
AE35	3	ECC Zeros Detect was not on after Data Check was indicated to be correctable.	2	Controller Checks Received	DATA 205 (3340)		
				xxxx xxx1 Expected			
AE36	3	ECC Low pattern register incorrect after a correctable Data Check.	2	ECC Low Received	DATA 210, Entry A (3340)		
				1000 0000 Expected			
AE37	3	ECC High pattern register incorrect after a correctable Data Check.	2	ECC High Received	DATA 210, Entry A (3340)		
				0000 0011 Expected			
AE3F	3	No Index Alert after a 25 millisecond wait during an ECC Correct Operation.			RPI 170, Entry B		

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
AE40	4	No Check End after an uncorrectable Data Check was read.			DATA 207, Entry A (3340)		
AE41	4	No ECC Data Check, bit 3, after a Data Check was forced.	2	Bus In under Check End 1xx1 xxxx Received Expected	DATA 207, Entry B (3340)		
AE42	4	Uncorrectable Data Check was indicated to be correctable during an ECC correction operation. (Index Alert turned on.)			RPI 170, Entry A		
AE43	4	Normal End was not received by an ECC correction operation. (Normal End indicates an uncorrectable Data Check.)			DATA 207, Entry C (3340)		
AE44	4	ECC Zeros Detect was on after an uncorrectable Data Check was processed through a correction cycle.	2	Controller checks xxxx xxx0 Received Expected	DATA 205 (3340)		

MICRODIAGNOSTIC ERROR CODE DICTIONARY

AE ECC LOGIC TEST

MICRO 760

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
AE50	5	ECC pattern read does not match what was written during a Write ECC burst.	2	Data byte Received	DATA 190 (3340)	Record should read '00 00 FF FF FF FF FF FF'.	
			3	Data byte Expected			

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AE ECC LOGIC TEST

MICRO 760

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
AEF1		Drive did not become Busy after a Seek Start or Rezero command.	2	Bus In under Read Status Tag '84' Bus '00' xxxx xx1x	Received Expected	ACC 210, Entry C (3340) Run routine B3 to gather drive and controller error bytes.	
AEF2		Drive Check received after a Seek or Rezero operation.	2	Bus In under Read Status Tag '84' Bus '00' xx0x xxx1	Received Expected	Run routine A2, A3, and A4.	
AEF3	2, 3 4, 5	Microprogram timed-out waiting for a response from the controller.			DATA 113 (3340)		
AEF5	2, 3 4, 5	Read an incorrect HA prior to writing the test pattern. Should be cylinder 349, head 1.				Run routine AF.	
AEF6	2, 3 4, 5	No End status after a 25 millisecond wait after a Read G1, Write G2, or Set Read/Write command.			CTL-I 260, Entry B (3340)		

MICRODIAGNOSTIC ERROR CODE DICTIONARY

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
AEF8	1	Program timed-out waiting for Index Alert or Index Mark, not Active Track.			RPI 150, Entry B		
AEF9	2, 3 4, 5	Error Alert received during one of the following Tags: Set Read/Write Read G1 Write G2 Read G2	2	Bus In under Read Status Tag '84' Bus '00' 0000 xxxx Received Expected		Error Alert other than ECC Hardware Check. Run routine B3. Display the Fault Symptom Code and refer to the FSI.	
AEFA	2, 3 4, 5	ECC Hardware Check received during one of the following Tags: Set Read/Write Read G1 Write G2 Read G2	2	Controller Checks xxxx xx0x Received Expected	DATA 200, Entry B (3340)		
AEFD	2, 3 4, 5	No End status after a 25-millisecond wait during a Read G1 or Read G2			DATA 113, Entry A (3340)		
AEFE	2, 3 4, 5	Unexpected Check End received during a Read G1 or Read G2, other than ECC Data Check.	2	Bus In under Check End 0001 1000 Received Expected	CTL-I 210, Entry A (3340)	Note: ECC Data Checks during a Read G1 are ignored.	

MICRODIAGNOSTIC ERROR CODE DICTIONARY

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
AF01 through AF07		Errors common to all routines.			MICRO 89		

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
AF08	ANY	Failed to raise Busy following a Rezero start.	2	Bus In under Read Status Tag '84' Bus '00' xxxx xxxx xxxx xx1x Received Expected	ACC 210, Entry C	Test numbers indicated by ANY refer to pre-test initialization which precedes the execution of the first test. To loop these errors, any test number ('01' – '0F') may be selected.	
AF09	ANY	Failed to raise Busy following a Seek start.	2	Bus In under Read Status Tag '84' Bus '00' xxxx xxxx xxxx xx1x Received Expected	ACC 210, Entry C	Test numbers indicated by ANY refer to pre-test initialization which precedes the execution of the first test. To loop these errors, any test number ('01' – '0F') may be selected.	
AF0A	ANY	Incorrect status following a Rezero operation.	2	Bus In under Read Status Tag '84' Bus '00' xxxx xxxx xx0x xx01 Received Expected	FSI 70	Run routine B3 pass 2. Display Message Byte 9 (Access Status). Test numbers indicated by ANY refer to pre-test initialization which precedes the execution of the first test. To loop these errors, any test number ('01' – '0F') may be selected.	
AF0B	ANY	Incorrect status following a Seek operation.	2	Bus In under Read Status Tag '84' Bus '00' xxxx xxxx xx0x xx01 Received Expected	ACC 540, Entry B	Test numbers indicated by ANY refer to pre-test initialization which precedes the execution of the first test. To loop these errors, any test number ('01' – '0F') may be selected.	
AF0C	ANY	Failed to receive Normal End response following a Set Read/Write operation.			CTL-I 260, Entry B (3340)	Test numbers indicated by ANY refer to pre-test initialization which precedes the execution of the first test. To loop these errors, any test number ('01' – '0F') may be selected.	
AF0D	ANY	Failed to orient on Index and Active Track.				Run routine A5, Index and Sector test. Test numbers indicated by ANY refer to pre-test initialization which precedes the execution of the first test. To loop these errors, any test number ('01' – '0F') may be selected.	
AF0E	ANY	Received Error Alert following a Set Read/Write operation.				Run routine B3. Display the Fault Symptom Code and refer to the FSI. Test numbers indicated by ANY refer to pre-test initialization which precedes the execution of the first test. To loop these errors, any test number ('01' – '0F') may be selected.	
AF0F	ANY	Unexpected Attention Status received.	2	Bus In under Read Status Tag '84' Bus '00' xxxx xxxx xxxx x000 Received Expected		Indicates unexpected access mechanism movement since last Seek. Reload routine AF. Test numbers indicated by ANY refer to pre-test initialization which precedes the execution of the first test. To loop these errors, any test number ('01' – '0F') may be selected.	

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
AF12	ANY	PA 1 and PA 2 compare incorrectly and no error condition detected.	2	xxxx xxxx = PA 1 Received	ACC 501, Entry A	Run attachment tests before continuing. This error may be a read problem. Run access routines A7, B8, and B9 to verify servo operations. If this has been done, refer to the operating instructions on MICRO 32. Test numbers indicated by ANY refer to pre-test initialization which precedes the execution of the first test. To loop these errors, any test number ('01' – '0F') may be selected.	
			3	xxxx xxxx = PA 2 Received			
				0011 0000 = PA 1 Expected			
				1000 0001 = PA 2 Expected			
AF15	1	Read G1 Unoriented is on following initiation of a Read G1 operation immediately after orientation on Index and Active Track.	2	Bus In under Read Op Tag '0E' and Tag Valid xxxx xxxx Received	DATA 90, Entry A (3340)		
				xxxx xx0x Expected			
AF16	1	Read G1 Unoriented is off following initiation of an unoriented Read G1 operation.	2	Bus In under Read OP Tag '0E' and Tag Valid xxxx xxxx Received	DATA 90, Entry B (3340)		
				xxxx xx1x Expected			
AF17	1	Unexpected Attention Status received.	2	Bus In under Read Status Tag '84' Bus '00' xxxx xxxx Received		Indicates unexpected access mechanism movement since last Seek. Reload routine AF.	
				xxxx x000 Expected			
AF18	1	PA 1 and PA 2 bytes not = '3081' and no error conditions detected.	2	xxxx xxxx = PA 1 Received		If the password (see MICRO 32) has been used prior to receiving this stop, there has been an access malfunction. Run access routines A7, B8, and B9 to verify servo operations. Do not continue with routine AF. If the password has not been used prior to receiving this stop, loop routine AF test '0E' (see MICRO 32) to restore the physical address of this location. Exit to ACC 501, Entry A if routine AF continues to fail with Error Code AF18.	
			3	xxxx xxxx = PA 2 Received			
				0011 0000 = PA1 Expected			
				1000 0001 = PA 2 Expected			
AF19	1	Timeout. Failed to orient on Index Alert.				Run routine A5 (Index and Sector test).	

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
AF1A	ANY	Error Alert received following a Read G1 operation.	2	Operation number. See Figure 1 on MICRO 824.		Run routine B3. Display the Fault Symptom Code and refer to the FSI. Test numbers indicated by ANY refer to pre-test initialization which precedes the execution of the first test. To loop these errors, any test number ('01' – '0F') may be selected.	
AF1B	ANY	Received Check End response following a Read G1 operation.	2	Operation number. See Figure 1 on MICRO 824.	CTL-I 210, Entry B (3340)	Test numbers indicated by ANY refer to pre-test initialization which precedes the execution of the first test. To loop these errors, any test number ('01' – '0F') may be selected.	
			3	Check End byte xxxx xxxx 0000 0000			
				Received Expected			
AF1C	ANY	Unexpected End received during a Read G1 operation.	2	Operation number. See Figure 1 on MICRO 824.	DATA 100, Entry A (3340)	Test numbers indicated by ANY refer to pre-test initialization which precedes the execution of the first test. To loop these errors, any test number ('01' – '0F') may be selected.	
			3	Check End byte xxxx xxxx			
AF1D	ANY	Microprogram timed-out waiting for a response from the controller during a Read G1 operation.	2	Operation number. See Figure 1 on MICRO 824.	DATA 113, Entry A (3340)	Test numbers indicated by ANY refer to pre-test initialization which precedes the execution of the first test. To loop these errors, any test number ('01' – '0F') may be selected.	
AF1E	ANY	Failed to receive any End response.	2	Operation number. See Figure 1 on MICRO 824.	CTL-I 260, Entry B (3340)	Test numbers indicated by ANY refer to pre-test initialization which precedes the execution of the first test. To loop these errors, any test number ('01' – '0F') may be selected.	

MICRODIAGNOSTIC ERROR CODE DICTIONARY

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
AF21	2	Unexpected Attention Status received.	2	Bus In under Read Status Tag '84' Bus '00' xxxx xxxx xxxx x000	Received Expected	Indicates unexpected access mechanism movement since last Seek. Reload routine AF.	
AF24	2	Received Command Overrun or unoriented status following an oriented Write G2 operation.	2	Bus In under Check End byte xxxx xxxx 0x0x xxxx	Received Expected		
AF26	2	Failed to receive Check End following an unoriented Write G2 operation.			CTL-I 220, Entry B (3340)		
AF28	2	Failed to receive Command Overrun status following an unoriented Write G2 operation.	2	Bus In under Check End byte xxxx xxxx 1xxx xxxx	Received Expected		

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
AF2A	2	Received Error Alert.	2	Operation number. See Figure 1 on MICRO 824.		Run routine B3. Display the Fault Symptom Code and refer to the FSI.	
AF2B	2	Received Check End response.	2	Operation number. See Figure 1 on MICRO 824.	CTL-I 210, Entry B (3340)		
			3	Check End byte xxxx xxxx Received			
				0000 0000 Expected			
AF2C	2	Received an unexpected End during a Read G1 operation or during an unoriented Write G2 operation.	2	Operation number. See Figure 1 on MICRO 824.	CTL-I 210, Entry B (3340)		
			3	Check End byte xxxx xxxx Received			
AF2D	2	Microprogram timed-out waiting for a response from the controller during a Read G1 or Write G2 operation.	2	Operation number. See Figure 1 on MICRO 824.	DATA 113, Entry A (3340)		
AF2E	2	Failed to receive any End response.	2	Operation number. See Figure 1 on MICRO 824.	CTL-I 260, Entry B (3340)		

MICRODIAGNOSTIC ERROR CODE DICTIONARY

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
AF31	3	Unexpected Attention Status received.	2	Bus In under Read Status Tag '84' Bus '00' xxxx xxxx xxxx x000 Received Expected		Indicates unexpected access mechanism movement since last Seek. Reload routine AF.	
AF32	3	Failed to orient on Index and Active Track.				Run routine A5 (Index and Sector test).	
AF34	3	Failed to receive Check End following an unoriented Write G2 operation.			CTL-I 260, Entry B (3340)		
AF36	3	Failed to receive Check End following an unoriented Clock G2 operation.			CTL-I 260, Entry B (3340)		

MICRODIAGNOSTIC ERROR CODE DICTIONARY

AF FORMAT READ/WRITE TEST MICRO 79

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AF FORMAT READ/WRITE TEST MICRO 79

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
AF41	4	Unexpected Attention Status received.	2	Bus In under Read Status Tag '84' Bus '00' xxxx x000	Received Expected	Indicates unexpected access mechanism movement since last Seek. Reload routine AF.	
AF42	4	Microprogram timed-out waiting for a response from the controller during a Write G1 operation.			DATA 113, Entry A (3340)		
AF44	4	No End received following a Write G1 operation.			CTL-I 260, Entry B (3340)		
AF46	4	Failed to receive Check End following a Write G1 operation.			CTL-I 260, Entry B (3340)		
AF48	4	Failed to receive Sync Out timing error End status from a Write G1 operation.	2	Bus In under Check End byte xxxx xxxx x1xx xxxx	Received Expected	DATA 110, Entry A (3340)	
AF4A	4	Failed to receive Status Overrun bit on Bus In when forced.	2	Bus In under Write operation while Tag Valid is active. xxxx 1xxx	Received Expected	DATA 165, Entry A (3340)	
AF4C	4	Failed to reset Status Overrun bit on Bus In when Tag Valid is dropped.	2	Bus In under Write operation while Tag Valid is active. xxxx 0xxx	Received Expected	DATA 165, Entry B (3340)	

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
AF51	5	Unexpected Attention Status received.	2	Bus In under Read Status Tag '84' Bus '00' xxxx x000	Received Expected	Indicates unexpected access mechanism movement since last Seek. Reload routine AF.	
AF52	5	Failed to set HAR = '00'.	2	Bus In under Sense HAR Tag '8F' Bus '05' 0000 0000	Received Expected	Run routine A2. Test 8 tests HAR.	
AF53	5	Failed to set HAR = '01' approximately 20 microseconds after Index during a Read/Write operation. (Inside Allow HAR window.)	2	Bus In under Sense HAR Tag '8F' Bus '05' 0000 0001	Received Expected		
AF54	5	Failed to prevent set HAR = '02' approximately 120 microseconds after Index during a Read/Write operation. (Outside Allow HAR window.)			CTL-I 350 (3340)		
AF55	5	Failed to orient on Index and Active Track within 21 milliseconds.				Run routine A5 (Index and Active Track tests).	
AF57	5	Failed to transfer Sector Counter value to Target Register during the initiation of a Read G1 operation.	2	Bus In under Sense Target Tag '8F' Bus '0D' 1100 0000	Received Expected	RPI 230, Entry A	

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
AF61	6	Unexpected Attention Status received.	2	Bus In under Read Status Tag '84' Bus '00' xxxx x000 Received Expected		Indicates unexpected access mechanism movement since last Seek. Reload routine AF.	
AF6A	6	Received Error Alert following a Read G1 or Write G2 operation.	2	Operation number. See Figure 1 on MICRO 824.		Run routine B3. Display the Fault Symptom Code and refer to the FSI.	
AF6B	6	Received Check End response following a Read G1 or Write G2 operation.	2 3	Operation number. See Figure 1 on MICRO 824. Check End byte xxxx xxxx 0000 0000 Received Expected	CTL-I 210, Entry B (3340)	Test 6 depends on the proper placement of the G1 record on the track. A G1 record that occurs later than a normal extended G1 record causes this error. If not previously done, reformat G1 by looping routine AF test E, and then rerun test 6.	
AF6C	6	Received unexpected End response.	2 3	Operation number. See Figure 1 on MICRO 824. Check End byte xxxx xxxx 0000 0000 Received Expected	CTL-I 210, Entry B (3340)		
AF6D	6	Microprogram timed-out waiting for a response from the controller.	2	Operation number. See Figure 1 on MICRO 824.	DATA 113, Entry A (3340)		
AF6E	6	Failed to receive any End response following a Read G1 or Write G2 operation	2	Operation number. See Figure 1 on MICRO 824.	CTL-I 260, Entry B (3340)		

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
AF71	7	Unexpected Attention Status received.	2	Bus In under Read Status Tag '84' Bus '00' xxxx x000	Received Expected	Indicates unexpected access mechanism movement since last Seek. Reload routine AF.	
AF74	7	Failed to receive Check End following a Write G2 operation (forcing Track Overrun).			CTL-I 260, Entry B (3340)		
AF76	7	Failed to receive Track Overrun following a Write G2 operation	2	Check End byte xxxx xxxx xxx1 xxxx	Received Expected	DATA 160, Entry A (3340)	

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
AF7A	7	Received Error Alert.	2	Operation number. See Figure 1 on MICRO 824.		Run routine B3. Display the Fault Symptom Code and refer to the FSI.	
AF7B	7	Received Check End response.	2 3	Operation number. See Figure 1 on MICRO 824. Check End byte Received xxxx xxxx 0000 0000 Expected	CTL-I 210, Entry B (3340)		
AF7C	7	Received unexpected End response.	2 3	Operation number. See Figure 1 on MICRO 824. Check End byte Received xxxx xxxx 0000 0000 Expected	CTL-I 210, Entry B (3340)		
AF7D	7	Microprogram timed-out waiting for a response from the controller.	2	Operation number. See Figure 1 on MICRO 824.	DATA 113, Entry A (3340)		
AF7E	7	Failed to receive any End response.	2	Operation number. See Figure 1 on MICRO 824.	CTL-I 260, Entry B (3340)		

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
AF81	8	Unexpected Attention Status received.	2	Bus In under Read Status Tag '84' Bus '00' xxxx x000 Received Expected		Indicates unexpected access mechanism movement since last Seek. Reload routine AF.	
AF84	8	Failed to receive I Write Sense = 1.5 milliseconds after initiating an Fmt G2 operation.	2 3	Operation number. See Figure 1 on MICRO 824. Read Status Tag '84' Bus '00' xxxx x1xx Received Expected	DATA 122, Entry A (3340)		
AF85	8	Failed to receive I Write Sense = 0 after a Reset Read/Write operation.	2 3	Operation number. See Figure 1 on MICRO 824. Read Status Tag '84' Bus '00' xxxx x0xx Received Expected	DATA 122, Entry A (3340)		

MICRODIAGNOSTIC ERROR CODE DICTIONARY

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
AF8A	8	Received Error Alert.	2	Operation number. See Figure 1 on MICRO 824.		Run routine B3. Display the Fault Symptom Code and refer to the FSI.	
AF8B	8	Received Check End response.	2 3	Operation number. See Figure 1 on MICRO 824. Check End byte Received xxxx xxxx 0000 0000 Expected	CTL-I 210, Entry B (3340)		
AF8C	8	Received unexpected End response.	2 3	Operation number. See Figure 1 on MICRO 824. Check End byte Received xxxx xxxx 0000 0000 Expected	CTL-I 210, Entry B (3340)		
AF8D	8	Microprogram timed-out waiting for a response from the controller.	2	Operation number. See Figure 1 on MICRO 824.	DATA 113, Entry A (3340)		
AF8E	8	Failed to receive any End response.	2	Operation number. See Figure 1 on MICRO 824.	CTL-I 260, Entry B (3340)		

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
AF91	9	Unexpected Attention Status received.	2	Bus In under Read Status Tag '84' Bus '00' xxxx x000	Received Expected	Indicates unexpected access mechanism movement since last Seek. Reload routine AF.	
AF96	9	Failed to receive Check End following a Read G2 operation (of non-existent field).	2	Check End byte xxxx xxxx	Received	CTL-I 260, Entry B (3340)	
AF97	9	Failed to receive No Sync Found following a Read G2 operation (of non-existent field).	2	Check End byte xxxx xxxx xxxx x1xx	Received Expected	DATA 135, Entry A (3340)	

MICRODIAGNOSTIC ERROR CODE DICTIONARY

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
AF9A	9	Received Error Alert.	2	Operation number. See Figure 1 on MICRO 824.		Run routine B3. Display the Fault Symptom Code and refer to the FSI.	
AF9B	9	Received Check End response.	2 3	Operation number. See Figure 1 on MICRO 824. Check End byte Received xxxx xxxx 0000 0000 Expected	CTL-I 210, Entry B (3340)		
AF9C	9	Received unexpected End response.	2 3	Operation number. See Figure 1 on MICRO 824. Check End byte Received xxxx xxxx 0000 0000 Expected	CTL-I 210, Entry B (3340)		
AF9D	9	Microprogram timed-out waiting for a response from the controller.	2	Operation number. See Figure 1 on MICRO 824.	DATA 113, Entry A (3340)		
AF9E	9	Failed to receive any End response.	2	Operation number. See Figure 1 on MICRO 824.	CTL-I 260, Entry B (3340)		

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Referen
			BYTE	DESCRIPTION			
AFA1	A	Unexpected Attention Status received.	2	Bus In under Read Status Tag '84' Bus '00' xxxx x000	Received Expected	Indicates unexpected access mechanism movement since last Seek. Reload routine AF.	

MICRODIAGNOSTIC ERROR CODE DICTIONARY

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
AFAA	A	Received Error Alert.	2	Operation number. See Figure 1 on MICRO 824.		Run routine B3. Display the Fault Symptom Code and refer to the FSI.	
AFAB	A	Received Check End response.	2	Operation number. See Figure 1 on MICRO 824.	CTL-I 210, Entry B (3340)		
			3	Check End byte xxxx xxxx Received			
				0000 0000 Expected			
AFAC	A	Received unexpected End response.	2	Operation number. See Figure 1 on MICRO 824.	CTL-I 210, Entry B (3340)		
			3	Check End byte xxxx xxxx Received			
				0000 0000 Expected			
AFAD	A	Microprogram timed-out waiting for a response from the controller during a transfer of data.	2	Operation number. See Figure 1 on MICRO 824.	DATA 113, Entry A (3340)		
AFAE	A	Failed to receive any End response.	2	Operation number. See Figure 1 on MICRO 824.	CTL-I 260, Entry B (3340)		

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
AFB1	B	Unexpected Attention Status received.	2	Bus In under Read Status Tag '84' Bus '00' xxxx x000 Received Expected		Indicates unexpected access mechanism movement since last Seek. Reload routine AF.	
AFBA	B	Received Error Alert.	2	Operation number. See Figure 1 on MICRO 824.		Run routine B3. Display the Fault Symptom Code and refer to the FSI.	
AFBB	B	Received Check End response.	2	Operation number. See Figure 1 on MICRO 824.	CTL-I 210, Entry B (3340)		
			3	Check End byte xxxx xxxx Received			
				0000 0000 Expected			
AFBC	B	Received unexpected End response.	2	Operation number. See Figure 1 on MICRO 824.	CTL-I 210, Entry B (3340)		
			3	Check End byte xxxx xxxx Received			
				0000 0000 Expected			
AFBD	B	Microprogram timed-out waiting for a response from the controller during a transfer of data.	2	Operation number. See Figure 1 on MICRO 824.	DATA 113, Entry A (3340)		
AFBE	B	Failed to receive any End response.	2	Operation number. See Figure 1 on MICRO 824.	CTL-I 260, Entry B (3340)		

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
AFC1	C	Unexpected Attention Status received.	2	Bus In under Read Status Tag '84' Bus '00' xxxx x000	Received Expected	Indicates unexpected access mechanism movement since last Seek. Reload routine AF.	
AFC4	C	Failed to receive Check End following a Read G3 AM Search operation (after Erase operation).	2	Check End byte xxxx xxxx	Received	CTL-I 260, Entry B (3340)	
AFC5	C	Failed to receive No AM Found following a Read G3 AM Search operation (after Erase operation).	2	Check End byte xxxx xxxx xxxx 1xxx	Received Expected	DATA 130, Entry B (3340)	

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
AFCA	C	Received Error Alert.	2	Operation number. See Figure 1 on MICRO 824.		Run routine L Display the Fault Symptom Code and refer to the FSI.	320
AFCB	C	Received Check End response.	2	Operation number. See Figure 1 on MICRO 824.	CTL-I 210, Entry B (3340)		320
			3	Check End byte xxxx xxxx 0000 0000			
				Received Expected			
AFCC	C	Received unexpected End response.	2	Operation number. See Figure 1 on MICRO 824.	CTL-I 210, Entry B (3340)		320
			3	Check End byte xxxx xxxx 0000 0000			
				Received Expected			
AFCD	C	Microprogram timed-out waiting for a response from the controller during a transfer of data.	2	Operation number. See Figure 1 on MICRO 824.	DATA 113, Entry A (3340)		320
AFCE	C	Failed to receive any End response.	2	Operation number. See Figure 1 on MICRO 824.	CTL-I 260, Entry B (3340)		320

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
AFD1	D	Unexpected Attention Status received.	2	Bus In under Read Status Tag '84' Bus '00' xxxx x000	Received Expected	Indicates unexpected access mechanism movement since last Seek. Reload routine AF.	

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
AFDA	D	Received Error Alert.	2	Operation number. See Figure 1 on MICRO 824.		Run routine B3. Display the Fault Symptom Code and refer to the FSI.	320
AFDB	D	Received Check End response.	2	Operation number. See Figure 1 on MICRO 824.	CTL-I 210, Entry B (3340)		320
			3	Check End byte xxxx xxxx 0000 0000			
				Received Expected			
AFDC	D	Received unexpected End response.	2	Operation number. See Figure 1 on MICRO 824.	CTL-I 210, Entry B (3340)		320
			3	Check End byte xxxx xxxx 0000 0000			
				Received Expected			
AFDD	D	Microprogram timed-out waiting for a response from the controller.	2	Operation number. See Figure 1 on MICRO 824.	DATA 113, Entry A (3340)		320
AFDE	D	Failed to receive any End response following a transfer of data.	2	Operation number. See Figure 1 on MICRO 824.	CTL-I 260, Entry B (3340)		320
			3	Check End byte xxxx xxxx 0000 0000			
				Received Expected			

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
AFE1	E	Unexpected Attention Status received.	2	Bus In under Read Status Tag '84' Bus '00' xxxx x000	Received Expected	Indicates unexpected access mechanism movement since last Seek. Reload routine AF.	320
AFEA	E	Received Error Alert.	2	Operation number. See Figure 1 on MICRO 824.		Run routine B3. Display the Fault Symptom Code and refer to the FSI.	320
AFEB	E	Received Check End response following a Format Write G1 operation.	2	Operation number. See Figure 1 on MICRO 824.		CTL-I 210, Entry B (3340)	320
			3	Check End byte xxxx xxxx	Received		
				0000 0000	Expected		
AFEC	E	Received unexpected End response.	2	Operation number. See Figure 1 on MICRO 824.		CTL-I 210, Entry B (3340)	320
			3	Check End byte xxxx xxxx	Received		
				0000 0000	Expected		
AFED	E	Microprogram timed-out waiting for a response from the controller during a transfer of data.	2	Operation number. See Figure 1 on MICRO 824.		DATA 113, Entry A (3340)	320
AFEE	E	Failed to receive any End response following a transfer of data.	2	Operation number. See Figure 1 on MICRO 824.		CTL-I 260, Entry B (3340)	320

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
AFF1	F	Unexpected Attention Status received.	2	Bus In under Read Status Tag '84' Bus '00' xxxx x000	Received Expected	Indicates unexpected access mechanism movement since last Seek. Reload routine AF.	

MICRODIAGNOSTIC ERROR CODE DICTIONARY

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
AFFA	F	Received Error Alert.	2	Operation Code. See Figure 1 on MICRO 824.		Run routine B3. Display the Fault Symptom Code and refer to the FSI. Note. Ending Status Valid only on Check End type errors. See OPER 99 for Check End status from Read or Write errors. Refer to Figure 1 on MICRO 824 for description of operation number displayed.	320
			3	Check End byte Received See Note.			
AFFB	F	Check End response received following a Read or Write operation.	2	Operation Code. See Figure 1 on MICRO 824.	CTL-I 210, Entry B (3340)		320
			3	Check End byte Received See Note.			
AFFC	F	Received unexpected End response.	2	Operation Code. See Figure 1 on MICRO 824.	CTL-I 210, Entry B (3340)		320
			3	Check End byte Received See Note.			
AFFD	F	Microprogram timed-out waiting for a response from the controller during a transfer of data.	2	Operation Code. See Figure 1 on MICRO 824.	DATA 113, Entry A (3340)		320
			3	Check End byte Received See Note.			
AFFE	F	10 microseconds (minimum) timeout while waiting for Check End or Normal End response following a Read ' or Write operation.	2	Operation Code. See Figure 1 on MICRO 824.	CTL-I 260, Entry B (3340)		320
		Failed to receive any End response.					

OPERATION

This page defines the operations that occur during each test of routine AF.

The cross reference of Operation Description and Operation Number is found in Figure 1.

Example: Test 8 (3 operations)

Operation Description	Operation Number
RDG1	01
WRG2	02
FMG2	03

Displayed in Byte 2 of the Error Message Display.

ERROR CODES (Test 8 Example)

Routine AF8X has eight Error Codes associated with it. Seven of these Error Codes may occur with any of the three operations via the Operation Number found in Byte 2 of the Error Display.

The seven Error Codes are:

- AF84
- AF85
- AF8A
- AF8B
- AF8C
- AF8D
- AF8E

See Error Code AF8X.

ERROR FORMAT

The general Error Format is as follows:

- Byte 1 = Error Code
- Byte 2 = Operation Number

Figure 1. Operation Number (Code) Description

Error Number	Operation Number	Description	Tag/Bus
1X	00	RD G1	T'0E' B'49'
1X	01	RD G1	T'0E' B'49'
2X	01	RD G1	T'0E' B'49'
2X	02	WR G2	T'0F' B'21'
2X	03	RD G1	T'0E' B'49'
2X	04	WR G2	T'0F' B'21'
3X	01	WR G2	T'0F' B'21'
3X	02	CL G2	T'0E' B'21'
4X	01	WR G1	T'0F' B'41'
6X	01	RD G1	T'0E' B'49'
6X	02	WR G2	T'0F' B'28'
7X	01	RD G1	T'0E' B'49'
7X	02	WR G2	T'0F' B'25'
8X	01	RD G1	T'0E' B'49'
8X	02	WR G2	T'0F' B'25'
8X	03	FM G2	T'0F' B'64'
9X	01	RD G1	T'0E' B'49'
9X	02	RD G2	T'0E' B'64'
9X	03	CL G2	T'0E' B'24'
9X	04	RD G2	T'0E' B'64'
AX	01	RD G1	T'0E' B'49'
AX	02	FM G3	T'0E' B'54'
AX	03	RD G1	T'0E' B'49'
AX	04	RD G3	T'0E' B'54'
BX	01	RD G1	T'0E' B'49'
BX	02	CL G3	T'0E' B'14'
BX	03	RD G1	T'0E' B'49'
BX	04	RD G3	T'0E' B'74'
CX	01	AM Search RD G1	T'0E' B'49'
CX	02	FM ER	T'0F' B'71'
CX	03	RD G1	T'0E' B'49'
CX	04	RD G3	T'0E' B'71'
DX	01	AM Search FM G1	T'0F' B'C9'
DX	02	Special RD G1	T'0E' B'49'
EX	01	FM G1	T'0F' B'49'
EX	02	RD G1	T'0F' B'49'
FX	01	RD G1	T'0E' B'49'
FX	02	FM G2	T'0F' B'69'
FX	03	FM G3	T'0F' B'59'
FX	04	FM RE-Orient	T'0F' B'39'
FX	05	FM G3	T'0F' B'59'
FX	06	WR G2	T'0F' B'E9'
FX	07	Special WR G4	T'0F' B'B9'
FX	08	RD G1	T'0E' B'49'
FX	09	RD G2	T'0E' B'69'
RX	0A	RD G3	T'0E' B'59'
FX	0B	RD G2	T'0E' B'E9'
FX	0C	Special RD G4	T'0E' B'39'

For Tag/Bus details see OPER 98 through 101.

MICRODIAGNOSTIC ERROR CODE DICTIONARY

B0, B1, B2 READ/WRITE TESTS MICRO 840

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
B0 } 01 B1 } to B2 } 07		Errors common to all routines. (B0, B1, B2)			MICRO 89		380
B009 B109 B209		Error Alert received during a Set Read/Write.				Run routine B3. Display the Fault Symptom Code and refer to the FSI.	380
B00A B10A B20A		No End conditions received following a Set Read/Write.			CTL-I 260, Entry B (3340)		380
B00C B10C B20C		Error Alert received during a Read/Write.				Run routine B3. Display the Fault Symptom Code and refer to the FSI.	380
B00D B10D B20D		No End condition received following a Read/Write.			CTL-I 260, Entry B (3340)		380

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
B010 B110 B210		No Busy received after initiating a Rezero.	2	Bus In under Read Status Tag '84' Bus '00' xxxx xx1x Expected	ACC 210, Entry C		
B011 B111 B211		Incorrect drive status after a Rezero.	2	Bus In under Read Status Tag '84' Bus '00' xx0x xx01 Expected	ACC 301, Entry B		
B013 B113 B213		Incorrect drive status after a Seek.	2	Bus In under Read Status Tag '84' Bus '00' xx0x xx01 Expected	ACC 301, Entry B		

MICRODIAGNOSTIC ERROR CODE DICTIONARY

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
B030 B130 B230		Invalid movable head address was selected.				Invalid parameter entry. See the detailed description of the desired routine on MICRO 52 through 60.	
B031 B131 B231		Invalid fixed head address was selected.				Invalid parameter entry. See the detailed description of the desired routine on MICRO 52 through 60.	
B032 B132 B232		Selection of a fixed head is not allowed under this routine.				Invalid parameter entry. See the detailed description of the desired routine on MICRO 52 through 60.	
B033 B133 B233		Fixed heads are not installed.				Invalid parameter entry. See the detailed description of the desired routine on MICRO 52 through 60.	
B034 B134 B234		Seek verification error occurred during a Write Home Address. 1. Two consecutive HAs were read with the same customer, alternate, or invalid address. (Not a CE address.) 2. No HA could be read and the password was invalid.	2 3 4 5 6 7 8	Current physical cylinder high Current physical cylinder low Current HAR value Received PA 1 (Physical address high) Received PA 2 (Physical address low) Bus In under Check End Record number of the last Count field read	ACC 501, Entry A	To determine the physical head number and Index, see R/W 416.	
B035 B135 B235		Routine unable to verify access position. One of the following conditions exists: 1. No parameters were entered. (See MICRO 52 for details.) 2. Parameter entry Byte 1 equal to '10' and parameter entry Byte 5 (password) not equal to '5D'. (See MICRO 52 for details.) 3. Parameter entry is correct, but the routine cannot verify the access position. If this is the condition, run routine B0 on one head at a time with parameter entry Byte 5 set to '5D' until the problem is resolved. (See MICRO 52 for details.)				Invalid parameter entry. See the detailed description of the desired routine on MICRO 52 through 60.	
B036 B136 B236		Invalid cylinder address was selected.				Invalid parameter entry. See the detailed description of the desired routine on MICRO 52 through 60.	
B037 B137 B237		Logical unit address entered (Parameter Byte 2) did not correspond to the physical address of the drive in CE mode.				Invalid parameter entry. See the detailed description of the desired routine on MICRO 52 through 60.	

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
B038 B138 B238		Invalid values for sense bytes 5 and 6 (parameters 3 and 4) were entered. See MICRO 52 through 60.					
B0D0 B1D0 B2D0		Check End received during a Write Home Address.	2 3 4 5 6	↑ Current physical cylinder high Current physical cylinder low Current HAR value Record number of the current Count field being written Bus In under Check End ↓	CTL-I 210, Entry D (3340)	To determine the physical head number and Index, see R/W 416.	
B0D1 B1D1 B2D1		Check End received during a Write Count field.					
B0D2 B1D2 B2D2		Check End received during a Write Key field.					
B0D3 B1D3 B2D3		Check End received during a Write Data field.					

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
B0E0 B1E0 B2E0		Data Check received during a Read Home Address. (Read back check).	2 3 4 5 6	Current physical cylinder high Current physical cylinder low Current HAR value Record number of the last Count field read Bus In under Check End	R/W 300, Entry C	To determine the physical head number and Index, see R/W 416.	
B0E1 B1E1 B2E1		Data Check received during a Read Count field. (Read back check).					
B0E2 B1E2 B2E2		Data Check received during a Read Key field. (Read back check).					
B0E3 B1E3 B2E3		Data Check received during a Read Data field. (Read back check).					
B0E4 B1E4 B2E4		No Sync Found received during a Read Home Address. (Read back check).					
B0E5 B1E5 B2E5		No Sync Found received during a Read Count field. (Read back check).					
B0E6 B1E6 B2E6		No Sync Found received during a Read Key field. (Read back check).					
B0E7 B1E7 B2E7		No Sync Found received during a Read Data field. (Read back check).					

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
B0E8 B1E8 B2E8		Other Check Ends received during a Read Home Address. (Read back check.)	2 3 4 5 6	Current physical cylinder high Current physical cylinder low Current HAR value Record number of the last Count field read Bus In under Check End	CTL-I 210, Entry D (3340)	To determine the physical head number and Index, see R/W 416.	
B0E9 B1E9 B2E9		Other Check Ends received during a Read Count field. (Read back check.)					
B0EA B1EA B2EA		Other Check Ends received during a Read Key field. (Read back check.)					
B0EB B1EB B2EB		Other Check Ends received during a Read Data field. (Read back check.)					

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
B0F0 B1F0 B2F0		Data Check received during a Read Home Address. (Read verification).	2 3 4 5 6	Current physical cylinder high Current physical cylinder low Current HAR value Record number of the last Count field read Bus In under Check End	R/W 300, Entry C	To determine the physical head number and Index, see R/W 416.	
B0F1 B1F1 B2F1		Data Check received during a Read Count field. (Read verification.)					
B0F2 B1F2 B2F2		Data Check received during a Read Key field. (Read verification.)					
B0F3 B1F3 B2F3		Data Check received during a Read Data field. (Read verification.)					
B0F4 B1F4 B2F4		No Sync Found received during a Read Home Address. (Read verification.)					
B0F5 B1F5 B2F5		No Sync Found received during a Read Count field. (Read verification.)					
B0F6 B1F6 B2F6		No Sync Found received during a Read Key field. (Read verification.)					
B0F7 B1F7 B2F7		No Sync Found received during a Read Data field. (Read verification.)					

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
B0F8 B1F8 B2F8		Other Check Ends received during a Read Home Address. (Read verification.)	2 3 4 5 6	Current physical cylinder high Current physical cylinder low Current HAR value Record number of the last Count field read Bus In under Check End	CTL-I 210, Entry D (3340)	To determine the physical head number and Index, see R/W 416.	
B0F9 B1F9 B2F9		Other Check Ends received during a Read Count field. (Read verification.)					
B0FA B1FA B2FA		Other Check Ends received during a Read Key field. (Read verification.)					
B0FB B1FB B2FB		Other Check Ends received during a Read Data field. (Read verification.)					
B0FC B1FC B2FC		Incorrect Home Address was read or incorrect physical address bytes in a Count field.	2 3 4 5 6 7 8	Current physical cylinder high Current physical cylinder low Current HAR value Received PA 1 (Physical address high) Received PA 2 (Physical address low) Bus In under Check End Record number of the last Count field read	ACC 501, Entry A	To determine the physical head number and Index, see R/W 416.	

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
B0FD B1FD B2FD		No Sync Found, ECC Data Checks, or Seek Verification errors received during reading of a cylinder (movable heads). Error message bytes displayed indicate failing heads. Each bit corresponds to a specific head (movable heads).	2 3 4	Current physical cylinder high Current physical cylinder low Error Type Bit Description 0 1 = ECC Data Check 1 1 = No Sync Byte found 2 Not used 3 1 = Seek Verification error 4 Not used 5 Not used 6 Not used 7 1 = Odd Index selected	R/W 300, Entry C	CE Panel 0123 4567 Data Lamps Error Message Bytes (See Note) A 5678 01234567 89101112131415 1617181920212223 242526272829* * B 56789A 01234567 89101112131415 1617181920212223 2425262728293031 3233343536373839 4041424344454647 4849505152535455 56575859* * * * Movable Heads (Physical Address) Fixed Heads (Physical Address)	380
			5 6 7 8	Error bits for heads 0–7 Error bits for heads 8–15 Error bits for heads 16–23 Error bits for heads 24–29 (Bits 6 and 7 of Byte 8 are not used.)			
B0FE B1FE B2FE		No Sync Found, ECC Data Checks, or Seek Verification errors received during reading of the fixed heads. Error message bytes displayed indicate failing heads. Each bit corresponds to a specific head (fixed heads).	2 3 4	Current physical cylinder high Current physical cylinder low Error Type Bit Description 0 1 = ECC Data Check 1 1 = No Sync Byte Found 2 Not used 3 1 = Seek Verification error 4 Not used 5 Not used 6 Not used 7 1 = Odd Index selected	R/W 300, Entry C	* Not Used Lamp on indicates the head failed. Refer to lamp and byte number for specific head number. Note: If head 1 (on the CE cylinder) is the only head failing, it is possible that microdiagnostic routine AF or BB has left the CE cylinder, track 1, formatted incorrectly. Run routine B0 on head 1. See MICRO 52.	380
			5 6 7 8 9 A B C	Error bits for heads 0–7 Error bits for heads 8–15 Error bits for heads 16–23 Error bits for heads 24–31 Error bits for heads 32–39 Error bits for heads 40–47 Error bits for heads 48–55 Error bits for heads 56–59 (Bits 4 through 7 of Byte C are not used.)			

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
B0FF B1FF B2FF		Both movable and fixed heads failed. Display error bytes for errors BnFD and BnFE. (n=0, 1, or 2.)			R/W 300, Entry C	To display error BnFD after a BnFF error: 1. Set '00' in the Data Entry switches. 2. Operate the Execute switch twice. 3. Record the display byte data. 4. Set '20' in the Data Entry switches. 5. Operate the Execute switch once for each display byte. See MICRO 10 and 11 for details regarding control options. To display error BnFE after a BnFF error: 1. Display and record BnFD error as shown above. 2. Set '00' in the Data Entry switches. 3. Operate the Execute switch twice. 4. Record the display byte data. 5. Set '20' in the Data Entry switches. 6. Operate the Execute switch once for each display byte. See Additional Action on MICRO 856 for bit significance. Routine may be looped after error data display by setting '00' in the Data Entry switches and operating the Execute switch until the routine runs.	

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
B300	PASS 2 ONLY	No drive selected, ('00' = physical drive ID). Expected '01', '02', '04', '08', '10', '20', '40', or '80'.				Be sure that the desired drive is in CE Mode; check the CE Mode switch.	500
B303, B305, through B307	PASS 1 ONLY	Errors common to all routines.			MICRO 89		500
B3XX	PASS 1 ONLY	'xx' = First byte of Fault Symptom Code generated by Pass 1 of routine B3.	2	Second byte of Fault Symptom Code.	Record Fault Symptom Code and determine analysis procedure from Fault Symptom Index on FSI 100.	Display Message Byte 2 for second byte of Fault Symptom Code. Message display procedure is on MICRO 12. B3 Fault Symptom Code generation is described on FSI 60.	500
B3XX	PASS 2 ONLY	Normal termination of Pass 2. 'xx' = Physical drive ID, should be: '01', '02', '04', '08', '10', '20', '40', or '80' <i>More than one bit active in 'xx' indicates more than one drive selected. Be sure that only desired drive is in CE Mode.</i>	2-15	Device status information		Use procedure on MICRO 12 to display device status message bytes. Bytes are described in FSI 65.	500
			16	B3 routine ID			
B3FF	PASS 1 ONLY	Unable to generate Fault Symptom Code. <i>Routine B3 is a utility microprogram that is run in two passes to perform two functions:</i> <i>PASS 1 — Generate a Fault Symptom Code providing the necessary device status conditions have not been reset.</i> <i>PASS 2 — Display 15 bytes of device status information.</i> <i>See MICRO 64 for description.</i>				Run Pass 2 of routine B3 to display 15 bytes of device status information. Place '00' in Data Entry switches and operate the Execute switch <i>twice</i> to start Pass 2. See FSI 65 for description of Message Bytes.	500

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
B401 through B407		Errors common to all routines.			MICRO 89		
B411		Total delay values entered exceed 500 milliseconds.				See MICRO 68.	
B412		Tag '0F' (Write command) was entered when a drive was selected. This tag is allowed only when the controller is selected.				See MICRO 68.	
B413		Illegal Rezero (Tag '8F' Bus '02') or Seek Start (Tag '8F' Bus '08') command received.				See MICRO 68.	

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
B511		Microdiagnostic disk was loaded in the 3830-2 or Integrated Storage Control (ISC) 23FD when a '30' run option was executed. The functional micro disk must be used on these storage controls when using the '30' run option. This loads the Fault Symptom Code Generator into the overlay area.				1. Insert the function code disk in the 23FD file (3830-2 or ISC only). 2. Set the Data Entry switches on the 3340 CE Panel to '30' run option and operate the Execute switch. This restores the Fault Symptom Code Generator in the storage control.	

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
B6xx		See Volume R02 of the 3340 MLM for all routine B6 information.					

MICRODIAGNOSTIC ERROR CODE DICTIONARY

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
B801 through B807		Errors common to all routines.			MICRO 89		
B810	1 1	HDA sequence status is not in State 6 (Ready). HDA Sequence Error. Check that the correct CE Mode switch is on and the drive Start/Stop switch on the drive is in the Start position.	2	Bus In under Sense Status 2 Tag '8F' Bus '43' 0110 000x Expected	HDA 100, Entry E	Make sure the drive Start/Stop switch is in the Start position. Check that the correct CE Mode switch is on.	
B811	1	Drive Check failed to reset following a Check Reset.	2	Bus In under Read Status Tag '84' Bus '00' xx0x xxxx Expected	ACC 100, Entry A		
B812	1	HDA Attention remains on following an Attention Reset.	2	Bus In under Read Status Tag '84' Bus '00' xxxx x0xx Expected	ACC 200, Entry A		
B813	1	Busy Attention remained on following an Attention Reset.	2	Bus In under Read Status Tag '84' Bus '00' xxxx xx0x Expected	ACC 210, Entry B		
B814	1	Seek Complete/Sector Compare Attention remained on following an Attention Reset.	2	Bus In under Read Status Tag '84' Bus '00' xxxx xxx0 Expected	ACC 220, Entry B		

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
B820	2	Access Status received was other than 0000 0001 after issuing a Servo Go Home command.	2	Bus In under Sense Status 4 Tag '8F' Bus '13' 0000 0001 Expected	ACC 310, Entry A		
B821	2	Access Timeout Check failed to come on after being forced by issuing a Seek Start command to an access not in State 6 (Ready).	2	Bus In under Sense Status 4 Tag '8F' Bus '13' 1xxx xxxx Expected	ACC 110, Entry B		
B822	2	Drive Check failed to come on after forcing Access Timeout Check.	2	Bus In under Read Status Tag '84' Bus '00' xx1x xxxx Expected	ACC 101, Entry A		
B823	2	Access Timeout Check failed to reset following a Check Reset.	2	Bus In under Sense Status 4 Tag '8F' Bus '13' 0xxx xxxx Expected	ACC 110, Entry A		
B824	2	Access Control not in State 1 (Wait) after an Access Timeout Check was forced and a Check Reset was issued.	2 3	Bus In under Sense Status 4 Tag '8F' Bus '13' 0000 0001 Expected	ACC 310, Entry A		
B825	2	Odd Track bit on with Access Control in State 1 (Wait).	2 3	Bus In under Sense Status 2 Tag '8F' Bus '43' xxxx xxx0 Expected	ACC 310, Entry B		
B826	2	Drive Check failed to reset following a Check Reset.	2	Bus In under Read Status Tag '84' Bus '00' xx0x xxxx Expected	ACC 100, Entry A		

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
B827	2	Failed to get Busy indication following a Rezero command.	2	Bus In under Read Status Tag '84' Bus '00' xxxx xx10 Received Expected	ACC 210, Entry C		
B828	2	Premature Drive Check was detected within 140 milli-seconds following a Rezero command.	2	Bus In under Read Status Tag '84' Bus '00' xx0x xxxx Received Expected	ACC 110, Entry C		
B829	2	Access Timeout Check failed to come on after being forced. (180 ms delay Safety Timer.)	2	Bus In under Sense Status 4 Tag '8F' Bus '13' 1xxx xxxx Received Expected	ACC 110, Entry D		
B82A	2	Access Timeout Check failed to reset following a Check Reset.	2	Bus In under Sense Status 4 Tag '8F' Bus '13' 0xxx xxxx Received Expected	ACC 110, Entry A		
B82B	2	Seek Complete was not posted with Access Timeout Check and Drive Check.	2	Bus In under Read Status Tag '84' Bus '00' xxxx xxx1 Received Expected	ACC 220, Entry A		
B82C	2	Device Busy not off after an Attention Reset.	2	Bus In under Read Status Tag '84' Bus '00' xxxx xx0x Received Expected	ACC 210, Entry B		

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
B831	3	Target Velocity indication not on.	2	Bus In under Sense Status 3 Tag '8F' Bus '23' xx1x xxxx Received Expected	ACC 312, Entry A		
B832	3	Index not detected within 40 ms. Indicates no servo input signal.	2	Bus In under Sense Status 3 Tag '8F' Bus '23' 0000 0001 Received Expected	ACC 314, Entry A		
B833	3	Drive Status failed to indicate Busy after a Rezero command.	2	Bus In under Read Status Tag '84' Bus '00' xxxx xx0x Received Expected	ACC 210, Entry C		
B834	3	Head Address Register (HAR) failed to reset to zero after a Rezero command.	2	Bus In under Sense HAR Tag '8F' Bus '05' 0000 0000 Received Expected	DEV-I 250, Entry D		
B835	3	Difference Counter failed to reset to zero after a Rezero command.	2	Bus In under Sense Difference Counter Tag '8F' Bus '09' 0000 0000 Received Expected	DEV-I 250, Entry D		
B836	3	Sense Status 0 failed to indicate the Direction Bit, Difference 512, Difference 256, or CAR 512 bits equal to zero after a Rezero command.	2	Bus In under Sense Status 0 Tag '8F' Bus '03' 0000 xxxx Received Expected	DEV-I 250, Entry C		
B837	3	Target Velocity failed to reset after a Rezero command, indicating carriage movement.	2	Bus In under Sense Status 4 Tag '8F' Bus '13'	ACC 332, Entry A		

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
B838	3	Track Crossing latch failed to change state after carriage movement was indicated during Rezero mode.	2	Bus In under Sense Status 4 Tag '8F' Bus '13' Received	ACC 332, Entry B		
B839	3	High Velocity Overshoot Check detected during Rezero mode.	2	Bus In under Sense Status 4 Tag '8F' Bus '13' Received	ACC 334, Entry A		

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
B840	4	Access Control failed to detect Guardband latch before the end of a Rezero operation.	2	Bus In under Sense Status 4 Tag '8F' Bus '13' x1xx xxxx Received Expected	ACC 344, Entry A		
B841	4	Access Control failed to advance to State 16 (Move In) before the end of a Rezero operation.	2	Bus In under Sense Status 4 Tag '8F' Bus '13'	ACC 344, Entry B		
B842	4	Access Control failed to advance to State 6 (Linear Mode) before the end of a Rezero operation.	2	Bus In under Sense Status 4 Tag '8F' Bus '13'	ACC 352, Entry A		
B844	4	Unexpected Access Status at the end of a Rezero operation.	2	Bus In under Sense Status 4 Tag '8F' Bus '13' 0000 1110 Received Expected	ACC 301, Entry A		
B845	4	Invalid Drive Status at the end of a Rezero operation. Access Status is correct.	2	Bus In under Read Status Tag '84' Bus '00'	ACC 220, Entry A		
B846	4	Seek Complete failed to reset with an Attention Reset.	2	Bus In under Read Status Tag '84' Bus '00' 0000 1000 Received Expected	ACC 220, Entry B		

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
B851	5	Unexpected Access Status after a Rezero operation that was initiated to recover from an access error.	2	Bus In under Sense Status 4 Tag '8F' Bus '13' 0000 1110 Received Expected	ACC 301, Entry A		630
B852	5	Unexpected state advance after a Rezero command. Rezero was initiated with the carriage at Track 0.	2	Bus In under Sense Status 4 Tag '8F' Bus '13' 0001 0000 Received Expected	ACC 330, Entry C		630
B853	5	Target Velocity failed to turn off during a Rezero operation initiated from Track 0.	2	Bus In under Sense Status 4 Tag '8F' Bus '13'	ACC 330, Entry D		630
B854	5	Guardband pattern was not detected during a Rezero operation initiated from Track 0.	2	Bus In under Sense Status 4 Tag '8F' Bus '13'	ACC 330, Entry E		630
B855	5	Unexpected Access Status after a Rezero operation that was initiated from Track 0.	2	Bus In under Sense Status 4 Tag '8F' Bus '13' 0000 1110 Received Expected	ACC 301, Entry A		630
B856	5	Failed to sense track minus 9 before End Op.	2	Bus In under Sense Status 3 Tag '8F' Bus '23'	ACC 301, Entry A		630
B857	5	More than 9 track crossing pulses were received before reaching Track 0.	2	Bus In under Sense Status 3 Tag '8F' Bus '23'	ACC 344, Entry A		630

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
B860	6	Seek Complete was not received following a Seek Start command. Both the Head Address Register and Difference Counter were zero.	2	Bus In under Read Status Tag '84' Bus '00' xxxx xxx1 Received Expected	ACC 520, Entry A		
B861	6	Attention was not active when polling the device.	2	Bus In under Poll Device Tag '82' Bus '00' 1xxx xxxx Received Expected	DEV-I 270, Entry B		
B862	6	Attention failed to reset following an Attention Reset.	2	Bus In under Poll Device Tag '82' Bus '00' 0xxx xxxx Received Expected	DEV-I 270, Entry A		

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
B871	7	Drive not Busy after a Rezero operation.	2	Bus In under Read Status Tag '84' Bus '00' xxxx xx1x Expected	ACC 210, Entry C		
B872	7	Access error after a Rezero operation.	2	Bus In under Sense Status 4 Tag '8F' Bus '13' 0000 1110 Expected	ACC 301, Entry A		
B873	7	Drive not Busy after a Seek command.	2	Bus In under Read Status Tag '84' Bus '00' xxxx xx1x Expected	ACC 210, Entry C		
B874	7	Carriage movement not detected during a Seek operation.	2	Bus In under Sense Status 4 Tag '8F' Bus '13'	ACC 521, Entry A		
B875	7	Seek movement was in the wrong direction.	2	Bus In under Sense Status 4 Tag '8F' Bus '13'	ACC 521, Entry C		

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
B880	8	Drive Check received after a Rezero operation.	2	Bus In under Sense Status 4 Tag '8F' Bus '13' 0000 1110 Received Expected	ACC 301, Entry A		
B881	8	Unable to force Overshoot Check by seeking into the outer Guardband area.	2	Bus In under Sense Status 4 Tag '8F' Bus '13' x1xx xxxx Received Expected	ACC 120, Entry E		
B882	8	Failed to get Drive Check after a forced Overshoot Check.	2	Bus In under Read Status Tag '84' Bus '00' xx1x xxxx Received Expected	ACC 101, Entry A		
B883	8	Overshoot Check failed to reset after a Rezero command was issued for error recovery.	2	Bus In under Sense Status 4 Tag '8F' Bus '13' x0xx xxxx Received Expected	ACC 120, Entry A		
B885	8	Track crossing pulse not active within 300 microseconds.			ACC 521, Entry B		
B886	8	Track crossing pulse remained active for more than 100 microseconds.			ACC 521, Entry B		
B887	8	Overshoot Check active too early.	2	Bus In under Sense Status 4 Tag '8F' Bus '13' x0xx xxxx Received Expected	ACC 120, Entry D		
B888	8	Unable to force Overshoot Check. Suspect Track Crossing Counter problems.	2	Bus In under Sense Status 4 Tag '8F' Bus '13' x1xx xxxx Received Expected	ACC 120, Entry C		

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
B890	9	Failed to reset the Cylinder Address Register (CAR) after a Rezero operation.	2	Bus In under Sense CAR Tag '8F' Bus '01' 0000 0000 Received Expected	DEV-I 250, Entry D		630
B891	9	Failed to get Device Busy after a Seek or Rezero command.	2	Bus In under Read Status Tag '84' Bus '00' xxxx xx1x Received Expected	ACC 210, Entry C		630
B892	9	Difference Counter failed to decrement or decremented more than once on a single track crossing pulse.	2 3 4	Difference Counter value Difference Counter value Difference Counter value Received Expected Original	ACC 530, Entry A	Note: If Byte 4 of the logout is '00', the original Difference Counter value was 256.	630
B893	9	Access Check after a Rezero command.	2	Bus In under Sense Status 4 Tag '8F' Bus '13' 0000 1110 Received Expected	ACC 301, Entry A		630
B894	9	Access Check after a Seek command waiting for track crossing pulses.			ACC 542, Entry A		630
B895	9	Microprogram timed-out waiting for track crossing transitions after a Seek Start command.			ACC 521, Entry B		630

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
B8A1	A	Failed to detect Device Busy after a Rezero operation.	2	Bus In under Read Status Tag '84' Bus '00'	ACC 210, Entry C		630
			3	xxxx xx1x			
B8A2	A	Access error after a Rezero operation.	2	Bus In under Sense Status 4 Tag '8F' Bus '13'	ACC 301, Entry A		630
			3	0000 1110			
B8A3	A	Failed to detect Device Busy after a Seek operation.	2	Bus In under Read Status Tag '84' Bus '00'	ACC 210, Entry C		630
			3	xxxx xx1x			
B8A4	A	Access Control failed to advance to State A (Accelerate) after a Seek command.	2	Bus In under Sense Status 4 Tag '8F' Bus '13'	ACC 521, Entry B		630
			3	0000 1010			
B8A5	A	Access error during State A (Accelerate) of a Seek operation.	2	Bus In under Sense Status 4 Tag '8F' Bus '13'	ACC 540, Entry B		630
			3	0000 1010			
B8A6	A	Difference Counter value out of specification at state advance time.	2	Bus In under Sense Difference Counter Tag '8F' Bus '09'	ACC 542, Entry A		630
			3	>0101 0100 <0111 1100			
B8A7	A	Access error during State 8 (Decelerate) of a Seek operation.	2	Bus In under Sense Status 4 Tag '8F' Bus '13'	ACC 550, Entry A		630
			3	0000 1000			
B8A8	A	Difference Counter did not change during gain measurement sub-routine.			ACC 521, Entry B		630

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
B8A9	A	Velocity Gain out of specification (too fast). Specification value in microseconds is 330 plus or minus 20 (14 hex).	2	Actual value is '14' or less. 0001 0100 Received Expected	ACC 800, Entry B		630
B8AA	A	Velocity Gain out of specification (too slow). Specification value is 330 microseconds plus or minus 20 (14 hex).	2	Actual value is '14' or greater. 0001 0100 Received Expected	ACC 800, Entry B		630
B8AB	A	Access error during a Seek operation.	2	Bus In under Sense Status 4 Tag '8F' Bus '13' 0000 1110 Received Expected	ACC 510, Entry A		630
B8AC	A	Track following timer expired too early.			ACC 366, Entry A		630
B8AD	A	Unexpected status after a Seek operation.	2	Bus In under Sense Status 4 Tag '8F' Bus '13' 0000 1110 Received Expected	ACC 510, Entry A		630

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
B8B0	B	Failed to detect Device Busy after a Rezero operation.	2	Bus In under Read Status Tag '84' Bus '00' xxxx xx1x Received Expected	ACC 210, Entry C		
B8B1	B	Failed to detect Device Busy after a Seek operation.	2	Bus In under Read Status Tag '84' Bus '00' xxxx xx1x Received Expected	ACC 210, Entry C		
B8B2	B	Failed to get forced Overshoot Check.	2	Bus In under Sense Status 4 Tag '8F' Bus '13' x1xx xxxx Received Expected	ACC 120, Entry F		
B8B3	B	An unexpected Drive Check occurred during a Seek.	2	Bus In under Sense Status 4 Tag '8F' Bus '13' 0000 1110 Received Expected	ACC 510, Entry A		
B8B4	B	Drive Check received after a Rezero command.	2	Bus In under Sense Status 4 Tag '8F' Bus '13' 0000 1110 Received Expected	ACC 301, Entry A		
B8B6	B	Dropped On Line at inner Guardband area.	2	Bus In under Sense Status 4 Tag '8F' Bus '13' xxx1 xxxx Received Expected	HDA 710	If HDA powered down, HDA is not properly positioned or crash stop is defective. Use HDA replacement procedure on HDA 710 to check HDA installation.	

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference																		
			BYTE	DESCRIPTION																					
B8C0	C	No Bit Significant Device Address was received during a Poll Device operation with the CE drive selected.	2	Bus In under Poll Device Tag '82' Bus '00' Received For expected value, refer to Figure 1.	DEV-I 112, Entry A	Figure 1. <table><tr><th>Selected Drive</th><th>Expected Value</th></tr><tr><td>0</td><td>'80'</td></tr><tr><td>1</td><td>'40'</td></tr><tr><td>2</td><td>'20'</td></tr><tr><td>3</td><td>'10'</td></tr><tr><td>4</td><td>'08'</td></tr><tr><td>5</td><td>'04'</td></tr><tr><td>6</td><td>'02'</td></tr><tr><td>7</td><td>'01'</td></tr></table> Note: The selected drive is the physical address of the drive that is in CE mode.	Selected Drive	Expected Value	0	'80'	1	'40'	2	'20'	3	'10'	4	'08'	5	'04'	6	'02'	7	'01'	
Selected Drive	Expected Value																								
0	'80'																								
1	'40'																								
2	'20'																								
3	'10'																								
4	'08'																								
5	'04'																								
6	'02'																								
7	'01'																								
B8C1	C	Incorrect Bit Significant Device Address was received during a Poll Device operation with the CE drive selected.	2	Bus In under Poll Device Tag '82' Bus '00' Received For expected value, refer to Figure 1.	CTL-I 340, Entry A (3340)																				
B8C2	C	With the Unsuppressible Register set and the polling device unsuppressible, no Bit Significant Device Address was returned.	2	Bus In under Poll Device Tag '82' Bus '10' Received For expected value, refer to Figure 1.	CTL-I 340, Entry A (3340)																				
B8C3	C	With the Unsuppressible Register set and the polling device unsuppressible, the Bit Significant Device Address returned was incorrect.	2	Bus In under Poll Device Tag '82' Bus '10' Received For expected value, refer to Figure 1.	CTL-I 340, Entry A (3340)																				
B8C4	C	With the Unsuppressible Register reset and the polling device unsuppressible, a Bit Significant Device Address value was returned.	2	Bus In under Poll Device Tag '82' Bus '10' 0000 0000 Received Expected	CTL-I 340, Entry A (3340)																				

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
B8D0	D	Received an incorrect controller status byte.	2	Bus In under Sense Status for Controller Error 2 Tag '04' Bus '02' 0000 000x Received Expected		Run routine B3. Display the Fault Symptom Code and refer to the FSI.	
B8D1	D	Normal End was received prematurely for a Set Read/Write, Tag '85'.			CTL-I 261, Entry A (3340)		
B8D2	D	Check End was received for a Set Read/Write, Tag '85'.			CTL-I 261, Entry B (3340)		
B8D3	D	Normal End was not received in 500 microseconds after issuing a Set Read/Write and with no error conditions set.			CTL-I 260, Entry B (3340)		
B8D4	D	Normal End was not reset by the Response line.			CTL-I 430, Entry A (3340)		
B8D5	D	Error Alert was active due to a check condition other than Controller Check or Read/Write Check.	2	Bus In under Read Status Tag '84' Bus '00' Received		Run routine B3. Display the Fault Symptom Code and refer to the FSI.	
B8D6	D	Error Alert was active due to Controller Check. However, the controller status byte was other than 0000 000x.	2	Bus In under Sense Status for Controller Error 2 Tag '04' Bus '02' 0000 000x Received Expected		Use bits 0-6 of Byte 2 to form Fault Symptom Code 92xx and refer to the FSI.	

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
B8D7	D	Controller Check came on after a Set Read/Write operation while Error Alert was active. Proper controller status was returned.	2	Bus In under Sense Status for Controller Error 1 Tag '04' Bus '01' Received		Run routine B3. Display the Fault Symptom Code and refer to the FSI.	630
B8D8	D	Interface Check was active after a Set Read/Write operation with Error Alert inactive.	2	Bus In under Read Status Tag '84' Bus '00' x0xx xxxx Received Expected	DEV-I 200, Entry A		630
B8D9	D	False Read/Write Check.	2	Bus In under Sense Status 0 Tag '8F' Bus '03' Received	R/W 110, Entry A		630
B8DA	D	Head Short Check.	2	Bus In under Sense Status 0 Tag '8F' Bus '03' Received	R/W 100, Entry D		630
B8DB	D	Write Safety Check.	2	Bus In under Sense Read/Write Tag '8F' Bus '08' Received	R/W 100, Entry C	This error occurred on CE cylinder ('0230'), using head 0, and even Index.	630

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
B8E0	E	Normal End was received for Set Read/Write, Tag '85', without selecting a CE drive.			CTL-I 261, Entry A (3340)		
B8E1	E	Not able to force a No PLO Input error indication.	2	Bus In under Sense Status for Controller Error 2 Tag '04' Bus '02' x1xx xxxx Received Expected	DATA 261, Entry A (3340)		
B8E2	E	Controller Check failed to come on after receiving No PLO Input error indication.	2	Bus In under Read Status Tag '84' Bus '00' 1xxx xxxx Received Expected	DATA 261, Entry A (3340)		
B8E3	E	Error Alert did not come on after receiving a Controller Check.			DATA 261, Entry A (3340)		
B8E4	E	No PLO Input error indication failed to reset following a Controller Reset.	2	Bus In under Sense Status for Controller Error 2 Tag '04' Bus '02' x0xx xxxx Received Expected	CTL-I 160, Entry A (3340)		
B8E5	E	Controller Check failed to reset following a Controller Reset.	2	Bus In under Read Status Tag '84' Bus '00' 0xxx xxxx Received Expected	DATA 261, Entry A (3340)		
B8E6	E	Error Alert failed to reset following a Controller Reset.			DATA 261, Entry A (3340)		

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
B8F0	F	Busy indication failed to come on following a Rezero operation.	2	Bus In under Read Status Tag '84' Bus '00' xxxx xx1x Expected	Received	ACC 210, Entry C	
B8F2	F	Servo Off Track error failed to come on after being forced.	2	Bus In under Sense Status 4 Tag '8F' Bus '13' xx1x xxxx Expected	Received	ACC 130, Entry B	
B8F3	F	Drive Check failed to come on after being forced.	2	Bus In under Sense Status 4 Tag '8F' Bus '13' xx1x xxxx Expected	Received	ACC 101, Entry A	
B8F4	F	Capable/Enable Check failed to come on after being forced.	2	Bus In under Sense Read/Write Tag '8F' Bus '0B' x1xx xxxx Expected	Received	R/W 172, Entry A	
B8F5	F	Index Check failed to come on after being forced.	2	Bus In under Sense Read/Write Tag '8F' Bus '0B' xxx1 xxxx Expected	Received	RPI 100, Entry C	
B8F6	F	Read/Write Check failed to come on after being forced.	2	Bus In under Read Status Tag '84' Bus '00' xxx1 xxxx Expected	Received	R/W 112, Entry A	
B8F7	F	Drive Check failed to reset following a Check Reset.	2	Bus In under Read Status Tag '84' Bus '00' xx0x xxxx Expected	Received	ACC 100, Entry A	

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
B8F8	F	Capable/Enable Check failed to reset following a Check Reset.	2	Bus In under Sense Read/Write Tag '8F' Bus '0B' x0xx xxxx Received Expected	R/W 172, Entry B		
B8F9	F	Index Check failed to reset following a Check Reset.	2	Bus In under Sense Read/Write Tag '8F' Bus '0B' xxx0 xxxx Received Expected	RPI 100, Entry D		
B8FA	F	Read/Write Check failed to reset following a Check Reset.	2	Bus In under Read Status Tag '84' Bus '00' xxx0 xxxx Received Expected	R/W 112, Entry B		
B8FB	F	Drive Check was active following a Rezero operation.	2	Bus In under Sense Status 4 Tag '8F' Bus '13'	ACC 301, Entry A		

MICRODIAGNOSTIC ERROR CODE DICTIONARY

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
B901 through B907		Errors common to all routines.			MICRO 89		680
B910	1	Accessing error after a Rezero command.	2	Bus In under Sense Status 4 Tag '8F' Bus '13' 0000 1110 Received Expected	ACC 301, Entry A		680
B911	1	Timeout waiting for Sync In on a Read Home Address routine.			DATA 113 (3340)		680
B912	1	Read/Write Check received during a Read Home Address routine.	2	Bus In under Sense Read/Write Tag '8F' Bus '0B' 0000 0000 Received Expected	R/W 100, Entry C		680
B913	1	Received and expected PA bytes do not compare equal.	2 3 4	Not used PA 1 PA 2 PA 1 0000 0000 PA 2 0000 0000 Received Expected	ACC 501, Entry A		680
B914	1	Timeout waiting for End response (Normal/Check End).			CTL-I 260, Entry B (3340)		680
B915	1	Check End after a Read G1 command.	2	Bus In under Check End byte (Read G1 command only) Tag '0E' Bus '4C' 0000 0000 Received Expected	CTL-I 210, Entry A (3340)	This error occurred using head 0 and even Index.	680
B916	1	Error Alert received after a Set Read/Write or Read G1 command.				Run routine B3. Display the Fault Symptom Code and refer to the FSI.	680
B917	1	Busy not active during a Rezero command.	2	Bus In under Read Status Tag '84' Bus '00' xxxx xx10 Received Expected	ACC 210, Entry C		680

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
B921	2	Failed to get Device Busy after a Rezero command. (Tag '8F' Bus '02')	2	Bus In under Read Status Tag '84 Bus '00' xxxx xx1x Received Expected	ACC 210, Entry C		
B922	2	Difference Counter failed to decrement or decremented more than once on a single track crossing pulse.	2 3 4	Difference Counter value Difference Counter value Difference Counter value Received Expected Original	ACC 530, Entry A	Note: If Byte 4 of the logout is '00', the original Difference Counter value was 256.	
B923	2	Access Check was detected during a Rezero operation.	2	Bus In under Sense Status 4 Tag '8F' Bus '13' 0000 111x Received Expected	ACC 301, Entry A		
B924	2	Access failure was detected while waiting for a track crossing pulse.	2	Bus In under Sense Status 4 Tag '8F' Bus '13' 0000 111x Received Expected	ACC 510, Entry A		
B925	2	Program timeout while waiting for the track crossing latch to change states.			ACC 521, Entry B		

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
B930	3	Odd Track did not set/reset for odd/even cylinder.	2	Bus In under Sense Status 2 Tag '8F' Bus '43' xxxx xxx0 or xxxx xxx1 0110 0001 or 0110 0000 Received Expected	ACC 520, Entry B		680
B931	3	Access error after a Seek command.	2	Bus In under Sense Status 4 Tag '8F' Bus '13' 0000 1110 Received Expected	ACC 510, Entry A		680
B932	3	Timeout waiting for Sync In during a Read Home Address routine.	2	Bus In under Sense Read/Write Tag '8F' Bus '0B' 0000 0000 Received Expected	DATA 113 (3340)		680
B933	3	Home Address read does not compare to expected Home Address.	2 3 4 5 6	Not used PA 1 PA 2 PA 1 PA 2 Received Expected	ACC 501, Entry A		680
B934	3	Timeout waiting for End response (Normal/Check End).			CTL-I 260, Entry B (3340)		680
B935	3	Check End after a Read G1 command.	2	Bus In under Check End byte (Read G1 command only) Tag '0E' Bus '4C' 0000 0000 Received Expected	CTL-I 210, EntryA (3340)	This error occurred using head 0 and even Index.	680
B936	3	Error Alert after a Set Read/Write or Read G1 command.				Run routine B3. Display the Fault Symptom Code and refer to the FSI.	680

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
B940	4	Odd Track did not set/reset for odd/even cylinder.	2	Bus In under Sense Status 2 Tag '8F' Bus '43' xxxx xxx1 or xxxx xxx0 0110 0000 or 0110 0001 Received Expected	ACC 520, Entry B		680
B941	4	Access error after a Seek command.	2	Bus In under Sense Status 4 Tag '8F' Bus '13' 0000 1110 Received Expected	ACC 510, Entry A		680
B942	4	Timeout waiting for a Sync In during a Read Home Address routine.	2	Bus In under Sense Read/Write Tag '8F' Bus '0B' 0000 0000 Received Expected	DATA 113 (3340)		680
B943	4	Home Address read does not compare to expected Home Address.	2 3 4 5 6	Not used PA 1 PA 2 PA 1 PA 2 Received Expected	ACC 501, Entry A		680
B944	4	Timeout waiting for End response (Normal/Check End).			CTL-I 260, Entry B (3340)		680
B945	4	Check End received after a Read G1 command.	2	Bus In under Check End byte Tag '0E' Bus '4C' 0000 0000 Received Expected	CTL-I 210, Entry A (3340)	This error occurred using head 0 and even Index.	680
B946	4	Error Alert after a Set Read/Write or Read G1 command.				Run routine B3. Display the Fault Symptom Code and refer to the FSI.	680

MICRODIAGNOSTIC ERROR CODE DICTIONARY

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
B951	5	Access error after a Seek command.	2	Bus In under Sense Status 4 Tag '8F' Bus '13' 0000 1110 Received Expected	ACC 510, Entry A		680
B952	5	Timeout waiting for a Sync In during a Read Home Address routine.	2	Bus In under Sense Read/Write Tag '8F' Bus '0B' 0000 0000 Received Expected	DATA 113 (3340)		680
B953	5	Home Address read does not compare to expected Home Address.	2 3 4 5 6	Not used PA 1 PA 2 PA 1 PA 2 Received Expected	ACC 501, Entry A		680
B954	5	Timeout waiting for End response (Normal/Check End).			CTL-I 260, Entry B (3340)		680
B955	5	Check End after a Read G1 command.	2	Bus In under Check End byte Tag '0E' Bus '4C' 0000 0000 Received Expected	CTL-I 210, Entry A (3340)	This error occurred using head 0 and even Index.	680
B956	5	Error Alert after a Set Read/Write or Read G1 command.				Run routine B3. Display the Fault Symptom Code and refer to the FSI.	680

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
B961	6	Access error after a Seek command.	2	Bus In under Sense Status 4 Tag '8F' Bus '13' 0000 1110 Received Expected	ACC 510, Entry A		680
B962	6	Timeout waiting for Sync In during a Read Home Address routine.	2	Bus In under Sense Read/Write Tag '8F' Bus '0B' 0000 0000 Received Expected	DATA 113 (3340)		680
B963	6	Home Address read does not compare to expected Home Address.	2 3 4 5 6	Not used PA 1 PA 2 PA 1 PA 2 Received Expected	ACC 501, Entry A		680
B964	6	Timeout waiting for End response (Normal/Check End).			CTL-I 260, Entry B (3340)		680
B965	6	Check End after a Read G1 command.	2	Bus In under Check End byte Tag '0E' Bus '4C' 0000 0000 Received Expected	CTL-I 210, Entry A (3340)	This error occurred using head 0 and even Index.	680
B966	6	Error Alert after a Set Read/Write or Read G1 command.				Run routine B3. Display the Fault Symptom Code and refer to the FSI.	680

MICRODIAGNOSTIC ERROR CODE DICTIONARY

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Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
B971	7	Access error after a Seek command.	2	Bus In under Sense Status 4 Tag '8F' Bus '13' 0001 1110 Received Expected	ACC 510, Entry A		680
B972	7	Timeout error waiting for Sync In during a Read Home Address routine.	2	Bus In under Sense Read/Write Tag '8F' Bus '0B' 0000 0000 Received Expected	DATA 113 (3340)		680
B973	7	Home Address read does not compare to expected Home Address.	2 3 4 5 6	Not used PA 1 PA 2 PA 1 PA 2 Received Expected	ACC 501, Entry A		680
B974	7	Timeout waiting for End response (Normal/Check End).			CTL-I 260, Entry B (3340)		680
B975	7	Check End after a Read G1 command.	2	Bus In under Check End byte Tag '0E' Bus '4C' 0000 0000 Received Expected	CTL-I 210, Entry A (3340)	This error occurred using head 0 and even Index.	680
B976	7	Error Alert after a Set Read/Write or Read G1 command.				Run routine B3. Display the Fault Symptom Code and refer to the FSI.	680

DESCRIPTION

Routine BA analyzes Head/Disk Assembly (HDA) sequence failures by examining certain bits in the error status bytes in a prescribed sequence. Unique error numbers are produced, based upon the values contained within these bytes. Refer to the MICFL section for a detailed sequence of analysis of specific bytes/bits.

Drive Check Status	(Tag '8F' Bus '83') – Sense Status 1
HDA Sequence Control	(Tag '8F' Bus '43') – Sense Status 2
Load Switch Status	(Tag '8F' Bus '23') – Sense Status 3
Access Status	(Tag '8F' Bus '13') – Sense Status 4

PREREQUISITE

Refer to the microdiagnostic reference charts in the MICRO section.

OPERATING PROCEDURE

- Refer to the MICRO section for standard operating procedure.
- Refer to the microdiagnostic running instructions for parameter entries.

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Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
BA11		HDA Sequence stopped in State 1.	2 3 4 5	↑ Bus In under Sense Status 1 Tag '8F' Bus '83' Bus In under Sense Status 2 Tag '8F' Bus '43' Bus In under Sense Status 3 Tag '8F' Bus '23' Bus In under Sense Status 4 Tag '8F' Bus '13' ↓	HDA 210, Entry A	Conditions are correct to advance to next state.	710
BA12		HDA Sequence error in State 1. (Invalid status.)			HDA 340, Entry A	Inhibit HDA Recycle should not be on in State 1.	710
BA14		State 1 HDA Sequence error initial status is incorrect. Air switch is not active.			HDA 330, Entry B	Air is not active.	710
BA15		State 1 HDA Sequence error initial status is incorrect. Motor at Speed is active. (Invalid status.)			HDA 310, Entry A	Motor At Speed is active. This is incorrect in State 1.	710
BA16		Initial status is good. Conditions are correct to advance to State 3.			HDA 340, Entry A		710
BA21		HDA Sequence stopped in State 2.			HDA 230, Entry A	Conditions are correct to advance to next state. Suspect Rezero Complete failure.	710

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
BA22		HDA Sequence error in State 2. (Invalid status.)	2	Bus In under Sense Status 1 Tag '8F' Bus '83'	HDA 340, Entry A		
			3	Bus In under Sense Status 2 Tag '8F' Bus '43'			
BA31		HDA Sequence stopped in State 3.	4	Bus In under Sense Status 3 Tag '8F' Bus '23'	HDA 222, Entry A	Conditions are correct to advance to next state. Suspect a faulty 15-Second Timer.	
			5	Bus In under Sense Status 4 Tag '8F' Bus '13'			

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
BA41		HDA Sequence stopped in State 4. (Invalid status.)	2	Bus In under Sense Status 1 Tag '8F' Bus '83'	HDA 270, Entry A	Suspect a 15-Second Timer always active.	710
			3	Bus In under Sense Status 2 Tag '8F' Bus '43'			
BA51		HDA Sequence stopped in State 5. Failed to advance to next state.	4	Bus In under Sense Status 3 Tag '8F' Bus '23'	HDA 260, Entry A	Suspect a 15-Second Timer problem.	710
			5	Bus In under Sense Status 4 Tag '8F' Bus '13'			

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
BA81		HDA Sequence error in State 0. (Invalid status.)	2 3 4 5	↑ Bus In under Sense Status 1 Tag '8F' Bus '83' Bus In under Sense Status 2 Tag '8F' Bus '43' Bus In under Sense Status 3 Tag '8F' Bus '23' Bus In under Sense Status 4 Tag '8F' Bus '13' ↓	HDA 340, Entry A		710
BA83		HDA Sequence stopped in State 0. Drive Start/Stop switch not in Start position.			Drive A: HDA 201, Entry A Drive B: HDA 202, Entry A	Drive Start latch is off.	710
BA86		HDA Sequence stopped in State 0. All Interlocks are correct.			Drive A: HDA 201, Entry A Drive B: HDA 202, Entry A	HDA Sequence locked in State 0. Conditions are correct to advance to next state.	710
BA88		HDA Sequence error in State 0. Run status failure in State 6 (Ready). Motor At Speed is not active.			HDA 313, Entry A	Lost Motor At Speed in State 6 (Ready).	710
BA89		HDA Sequence error in State 0. Run status failure in State 6 (Ready). Air switch is not active. HDA Sequence Check latch is active.			HDA 330, Entry A	Lost Air in State 6 (Ready).	710
BA8A		HDA Sequence error in State 0. Inhibit HDA Recycle is active. (Invalid status.)			HDA 340, Entry A	Error indication received but initial status is good. Suspect Power On Reset problem.	710

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
BA92		HDA Sequence in State 0 with indications that Motor At Speed did not become active while in State 3.	2 3 4 5	Bus In under Sense Status 1 Tag '8F' Bus '83' Bus In under Sense Status 2 Tag '8F' Bus '43' Bus In under Sense Status 3 Tag '8F' Bus '23' Bus In under Sense Status 4 Tag '8F' Bus '13'	HDA 313, Entry B		
BA93		HDA Sequence in State 0 with indications that an Air switch failure occurred in State 3.			HDA 330, Entry B		
BA94		HDA Sequence in State 0 with indications that a Start/Stop switch failure occurred in State 3.			Drive A: HDA 201, Entry A Drive B: HDA 202, Entry A		
BA95		HDA Sequence error in State 3. (Invalid status.)			HDA 220, Entry A	Conditions are correct to advance to the next state. Suspect a faulty timer.	

Error Code	Test No.	Error Description	CE Panel Lamp Display		Maintenance Analysis Procedure	Additional Action and Reference Notes	MICFL Reference
			BYTE	DESCRIPTION			
BD01 to BD07		Errors common to all routines.			MICRO 100		
BD11		Following a Rezero or long Seek, Seek Complete was not received, Drive Check was not received, and Busy is now inactive.	2 3 and 4	Bus In under Read Status Tag '84' Bus '00' xx0x xx01 Delay value currently in Use Counter. Value is in microseconds. Received Expected	ACC 301, Entry B	The seek length is constant. Default = 07 or CE parameter 2 = XX (01 through 255).	
BD12		Failed to receive Busy following a Seek Start.	2 3 and 4	Bus In under Read Status Tag '84' Bus '00' xxxx xx1x Delay value currently in Use Counter. Value is in microseconds. Received Expected	ACC 210, Entry C	The seek length is constant. Default = 07 or CE parameter 2 = XX (01 through 255).	
BD13		Failed to receive Access Status following a Seek Start.	2 3 and 4	Bus In under Sense Status 4 Tag '8F' Bus '13' 0000 1100 Delay value currently in Use Counter. Value is in microseconds. Received Expected	ACC 510, Entry A	The seek length is constant. Default = 07 or CE parameter 2 = XX (01 through 255).	
BD14		Failed to receive the proper Access Status after 'nn' microseconds following a Seek Start.	2 3 and 4	Bus In under Sense Status 4 Tag '8F' Bus '13' 0000 1110 Delay value currently in Use Counter. Value is in microseconds. Received Expected	ACC 660, Entry A	The seek length is constant. Default = 07 or CE parameter 2 = XX (01 through 255).	
BD15		Received Read/Write Check, Drive Check, and Servo Off-Track errors.	2 3 and 4	Not Used Delay value currently in Use Counter Value is in microseconds.	ACC 660, Entry A	The seek length is constant. Default = 07 or CE parameter 2 = XX (01 through 255).	
BD16		Received Read/Write Check, Drive Check, and not Servo Off-Track errors.	2 3 and 4	Not Used Delay value currently in Use Counter. Value is in microseconds.	ACC 660, Entry A	The seek length is constant. Default = 07 or CE parameter 2 = XX (01 through 255).	

