



**CDC® FLEXIBLE DISK DRIVE
SUBSYSTEM
BR803, FA730, GD130, GD308**

GENERAL DESCRIPTION
OPERATION
INSTALLATION AND CHECKOUT
THEORY OF OPERATION
DIAGRAMS
MAINTENANCE
PARTS DATA

HARDWARE MAINTENANCE MANUAL

MANUAL TO EQUIPMENT LEVEL CORRELATION SHEET

This manual reflects the equipment configurations listed below.

EXPLANATION: Locate the equipment type and series number, as shown on the equipment FCO log, in the list below. Immediately to the right of the series number is an FCO number. If that number and all of the numbers underneath it match all of the numbers on the equipment FCO log, then this manual accurately reflects the equipment.

EQUIPMENT TYPE	SERIES	WITH FCOs	COMMENTS
BR803-U	09	PL12954	
FA730-A	06	DS021054	
GD130-A	01		
GD308-A	02		



LIST OF EFFECTIVE PAGES

New features, as well as changes, deletions, and additions to information in this manual, are indicated by bars in the margins or by a dot near the page number if the entire page is affected. A bar by the page number indicates pagination rather than content has changed.

PAGE	REV	PAGE	REV	PAGE	REV	PAGE	REV	PAGE	REV
Cover	-								
Title Page	-								
ii	F								
iii/iv	F								
v/vi	F								
vii/viii	F								
ix	F								
1-1	A								
1-2	A								
2-1 thru 2-3	A								
3-1	A								
4-1	A								
4-2	A								
5-1 thru 5-3	A								
6-1	D								
6-2	D								
6-3	A								
6-4	A								
6-5 thru 6-8	F								
6-8.1 thru 6-8.4	F								
6-9	B								
6-10	B								
6-11	A								
6-12	A								
6-13	F								
7-1	E								
Comment Sheet	F								
Cover	-								

PREFACE

This manual provides maintenance information for the Control Data® CYBER 18 Flexible Disk Drive Subsystem. The information contained herein supports maintenance of the flexible disk drive subsystem when it is incorporated in CYBER 18 systems. The subsystem includes the BR803 Flexible Disk Drive, the GD130 or GD308 power supplies, and the FA730 Flexible Disk Drive Controller.

This publication contains information to aid maintenance personnel in carrying out onsite maintenance tasks. The maintenance approach is to

fault isolate using the diagnostic decision logic tables (DDLs) and to make repairs by using the removal/replacement procedures. Corrective action is accomplished by exchanging replaceable subassemblies rather than components. When repair cannot be accomplished by exchanging replaceable subassemblies, a support customer engineer is required.

The publications listed below provide more detailed information relative to equipments, systems, and subsystems.

<u>Publication</u>	<u>Publication No.</u>
AA132, AA133, AA153, DT120, FC402 CYBER 18 Computer Systems Central Processor Field Repair Guide	60475001
CYBER 18 Computer Systems Overview Manual	60475000
CYBER 18 Computer Systems with MOS Memory Installation Manual	96768360
FA730 Flexible Disk Drive Controller Hardware Reference/Maintenance Manual	96768800
Flexible Disk Drive Field Service Manual	75736120
Operational Diagnostic System (ODS) Version 2 Reference Manual	96768410

WARNING

This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instructions manual, may cause interference with radio communications. It has been tested to comply with the limits for Class A peripheral computing device pursuant to Subpart J of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user, at his own expense, will be required to take whatever measures may be required to correct the interference.



CONTENTS

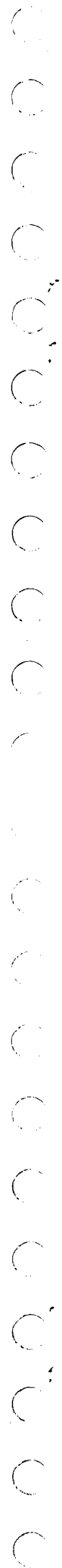
1.	GENERAL DESCRIPTION	1-1	Description of Diagnostic Decision Logic Tables	6-1
			Assumptions	6-1
2.	OPERATION	2-1	Conditions	6-1
			Responses	6-1
			Actions	6-1
3.	INSTALLATION AND CHECKOUT	3-1	Sequence of Actions	6-1
			User Notes	6-1
4.	THEORY OF OPERATION	4-1	ODS Software Procedures	6-3
	Replaceable Assemblies	4-1	1 Power Turn-On	6-9
	Flexible Disk Drive Controller	4-1	2 Power Turn-Off	6-9
	Flexible Disk Drive	4-1	3 Diskette Loading	6-9
	Interface Cable	4-1	4 Diskette Removal/Handling Recommendations	6-9
	Power Supplies	4-1	5 Power Supply Voltages Check	6-9
	Cartridge Disk	4-1	6 24 V dc Power Supply Replacement	6-11
	Switch Settings, Normal Operation	4-1	7 -5 V dc Power Supply Replacement	6-12
			8 Head Cleaning	6-12
			9 Flexible Disk Drive Replacement	6-12
5.	DIAGRAMS	5-1	10 Flexible Disk Drive Controller Replacement	6-13
6.	MAINTENANCE	6-1	11 Cassette/Diskette Run Parameters (Nonstandard Configurations)	6-13
	Maintenance Aids	6-1		
			7. PARTS DATA	7-1

FIGURES

1-1	Flexible Disk Drive Physical Characteristics	1-1	5-2 Flexible Disk Drive Interface Cable (Unit 0)	5-2
1-2	Flexible Disk Drive Subsystem Block Diagram	1-2	5-3 Flexible Disk Drive Interface Cable (Unit 1)	5-3
2-1	Flexible Disk Drive Interlock Switches and Assemblies	2-1	6-1 Example of a Diagnostic Decision Logic Table	6-2
2-2	Flexible Disk Drive Controls on Control Panel	2-2	6-2 Disk Installation	6-10
4-1	Flexible Disk Drive Controller Switches	4-2	6-3 Flexible Disk Drive Dc Power Supplies Test Points	6-11
5-1	Flexible Disk Drive Cable Assemblies	5-1	6-4 Flexible Disk Drive Mounting	6-12

TABLES

2-1	Flexible Disk Drive Interlock Switches and Assemblies	2-1	6-1 FDSKA: Flexible Disk DDLT	6-5
2-2	Flexible Disk Drive Controls on Control Panel	2-3	6-2 FDSKU: Flexible Disk DDLT	6-8.1
4-1	Flexible Disk Drive Subsystem Replaceable Assemblies	4-1	6-3 Run Parameters	6-13
			7-1 Parts Data for Flexible Disk Drive	7-1



The flexible disk drive is a random-access storage device utilizing a single removable disk cartridge (diskette) as a storage medium (see figure 1-1). The flexible disk drive contains all the analog read, write, and control electronics necessary to perform data transfer operations using only simple control commands. Data is transferred to or from the recording surface of the diskette via a single read/write head. Track positioning is accomplished by using a stepping motor. Index detection is via a photo-optical technique that senses the physical index hole in the diskette.

The diskette rotates at 360 revolutions per minute, and data is read or written on the 77 tracks of the single recording surface at a rate of 31,243 bytes per second, providing a total unformatted capacity of 0.375 megabyte. The subsystem can utilize either CDC or IBM format diskettes. The diskette is 7.88 inches (200 millimeters) in diameter and is contained in an 8-inch (203-millimeter) square protective envelope.

The flexible disk drive controller consists of a 11- by 14-inch (279- by 356-millimeter) printed wiring assembly that resides in a pre-assigned slot of the processor chassis (refer to the board (logic) removal procedure in the processor manual for slot assignment).

The flexible disk drive uses 120 V ac, 50/60 Hz power obtained from the processor power distribution system to operate the drive motor. The stepper motor is powered from a separate 24 V dc power supply. The ± 5 V dc logic voltage is obtained from the processor backplane in equipments AA132 and AA133 furnished with L.H. power supplies. In equipments using Scott power supplies, -5 V dc logic voltage comes from a separate power supply, and +5 V dc logic voltage is obtained from the processor backplane. Figure 1-2 is a block diagram of the flexible disk drive subsystem.

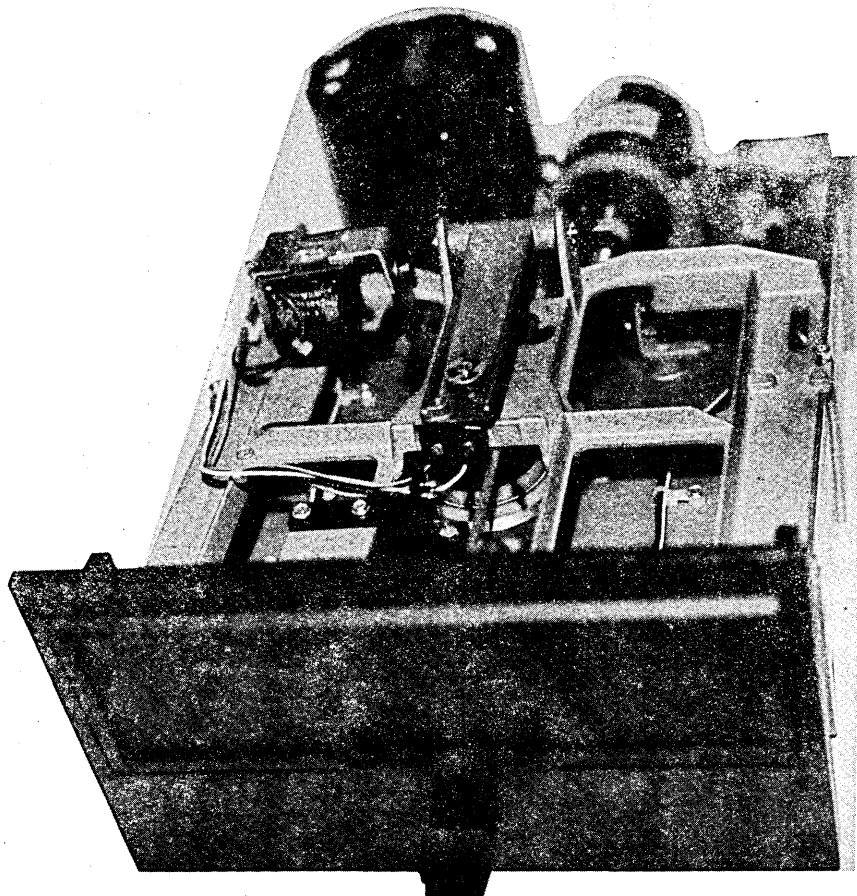
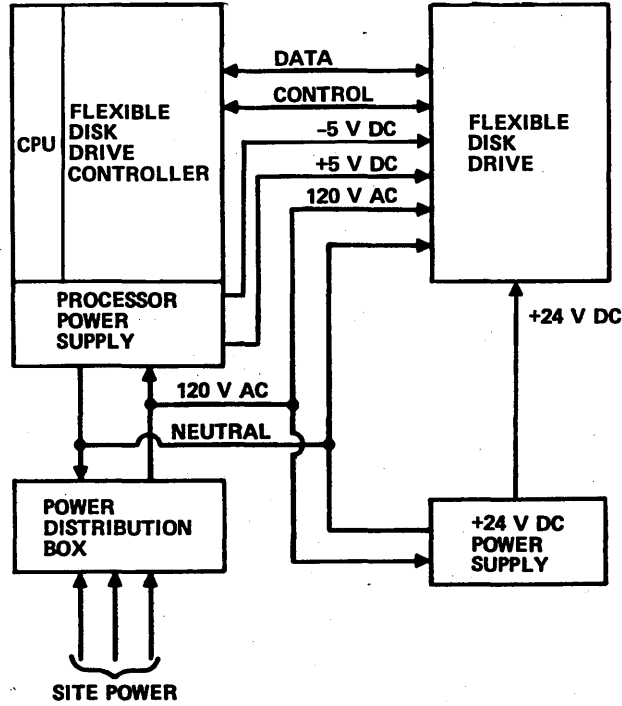
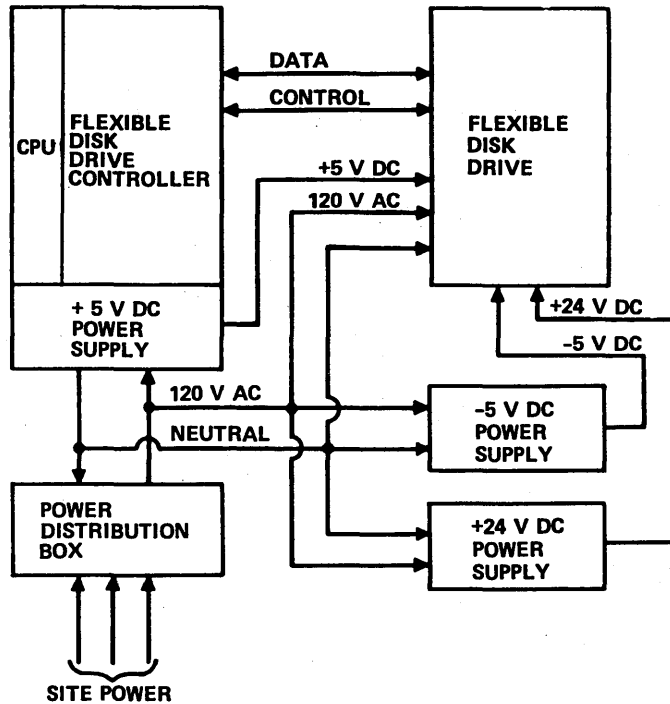


Figure 1-1. Flexible Disk Drive Physical Characteristics

**FLEXIBLE DISK DRIVE SUBSYSTEM WITH
GD130 POWER SUPPLY
(EQUIPMENT WITH L.H. POWER SUPPLY)**



**FLEXIBLE DISK DRIVE SUBSYSTEM WITH
GD308 POWER SUPPLY (EQUIPMENT WITH
SCOTT POWER SUPPLY)**



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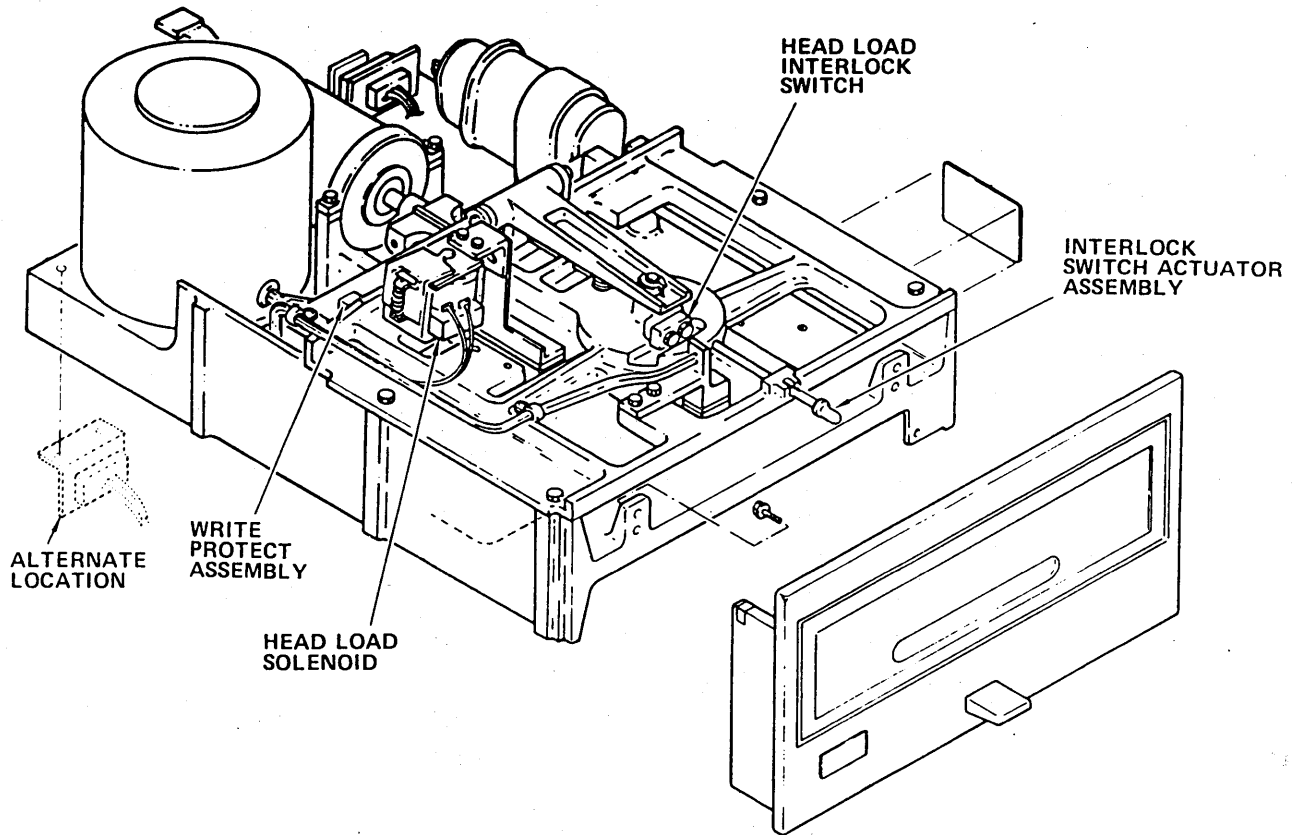
Figure 1-2. Flexible Disk Drive Subsystem Block Diagram

This section contains descriptions of the operator controls and indicators contained on the flexible disk drive equipment.

and their functions are described in table 2-1. External operator controls and indicators found on the operators panel (figure 2-2) are described in table 2-2.

Interlock switches and assemblies associated with the flexible disk drive subsystem are illustrated in figure 2-1

Internal switches found on the controller board are described in section 4.

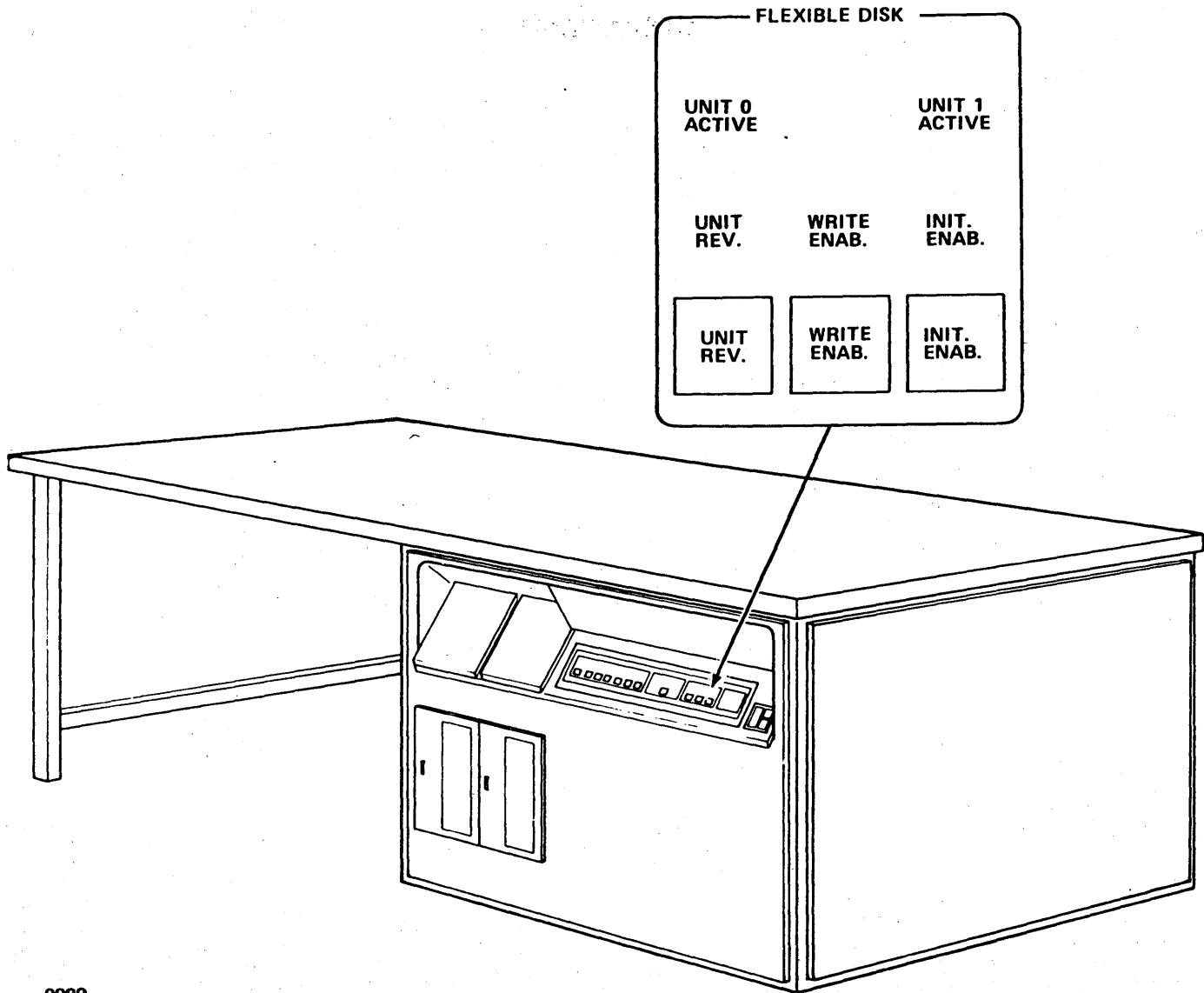


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Figure 2-1. Flexible Disk Drive Interlock Switches and Assemblies

TABLE 2-1. FLEXIBLE DISK DRIVE INTERLOCK SWITCHES AND ASSEMBLIES

Switch/Control	Type	Function
Head load interlock	Micro switch	This switch is mechanically linked to the door via a push rod assembly. When the diskette is inserted and the door is closed, the disk loading mechanism is ready to load the read and write head on command.
Write protect assembly (optional)	Photo-optical sensor	Senses presence or absence of a write protect hole in the jacket of the diskette. When the hole is uncovered, a write protect signal is sent to the controller.

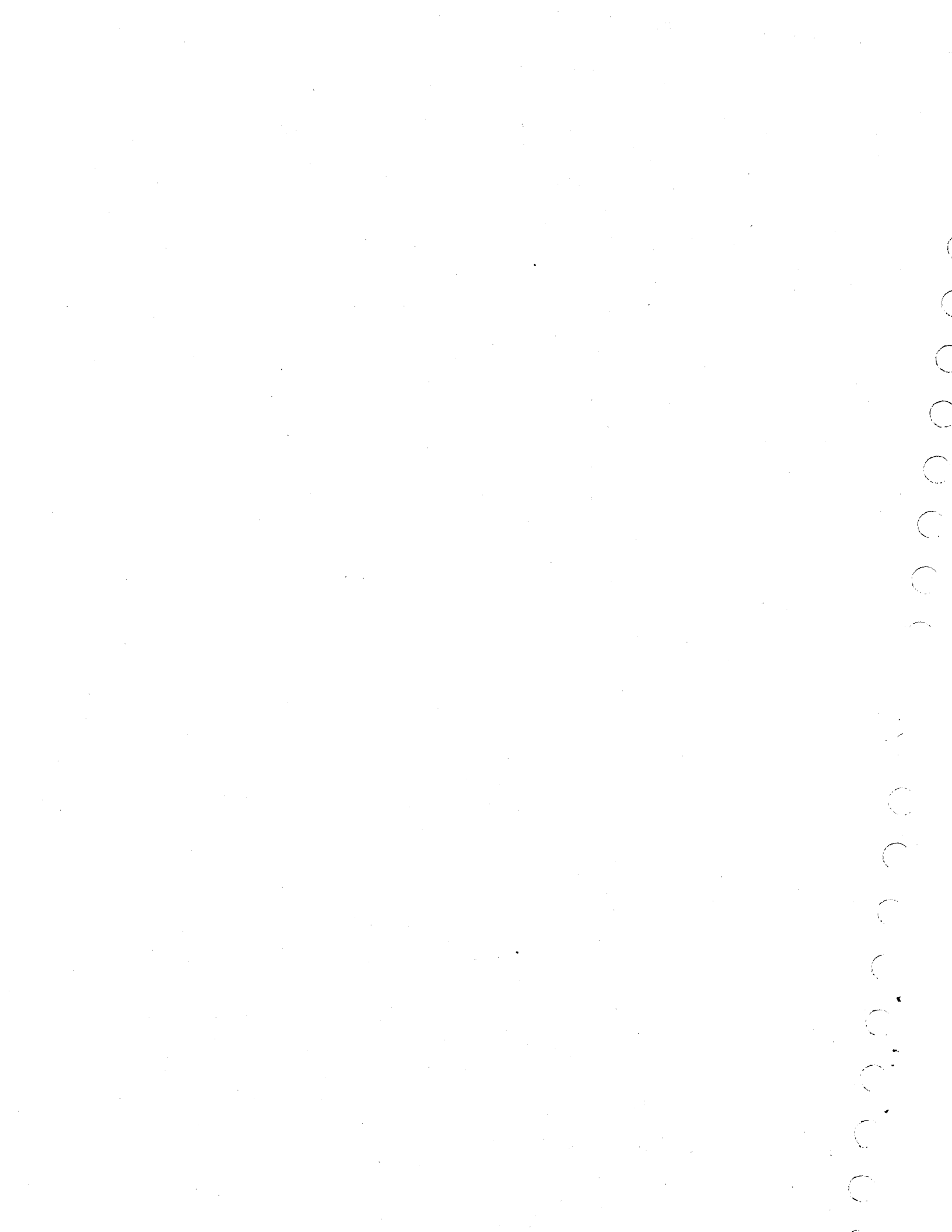


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Figure 2-2. Flexible Disk Drive Controls on Control Panel

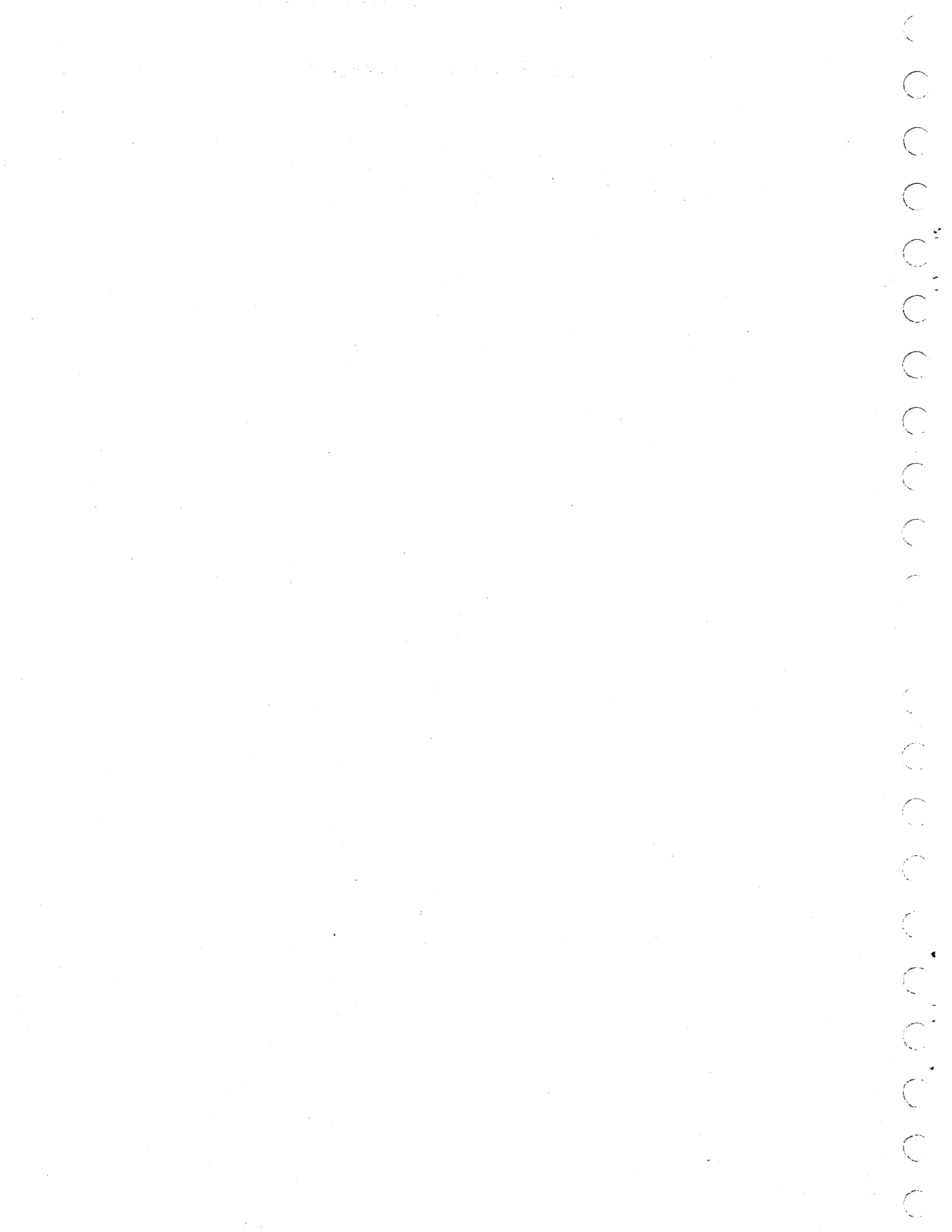
TABLE 2-2. FLEXIBLE DISK DRIVE CONTROLS ON CONTROL PANEL

Control	Type	Function
UNIT 0 ACTIVE	Indicator	When illuminated, indicates unit 0 heads are loaded and data is being transferred
UNIT 1 ACTIVE	Indicator	When illuminated, indicates unit 1 heads are loaded and data is being transferred
WRITE ENAB.	Pushbutton switch	When pressed, causes a write enable signal from the controller to be sent to the flexible disk drive
UNIT REV.	Pushbutton switch	Selects flexible disk drive for deadstart. Unit 0 is selected if the switch is off. Unit 1 is selected if it is on.
UNIT REV.	Indicator	When illuminated, indicates that the UNIT REV. switch is on
WRITE ENAB.	Indicator	When illuminated, indicates the WRITE ENAB. switch is on
INIT. ENAB.	Pushbutton switch	When on, allows address tags to be written on the diskette
INIT. ENAB.	Indicator	When illuminated, indicates the switch is in the on state



Refer to the installation manual listed in the preface for information applicable to installing the flexible disk drive subsystem. Detailed instructions on initial system

installation or adding new equipment to the system may be found in that manual.



This section contains a list of replaceable assemblies for the flexible disk drive subsystem and a brief description of each replaceable assembly.

REPLACEABLE ASSEMBLIES

FLEXIBLE DISK DRIVE CONTROLLER

Table 4-1 lists the replaceable assemblies of the flexible disk drive subsystem. See section 7 for a list of part numbers.

TABLE 4-1. FLEXIBLE DISK DRIVE SUBSYSTEM
REPLACEABLE ASSEMBLIES

Replaceable Assembly	Assembly Type
Flexible Disk Drive Controller	PWA
Flexible Disk Drive	Unit
Interface Cable	Unit
Power Supply	+24 V dc unit -5 V dc unit†
† Processors with Scott power supply	

The printed wiring assembly housed in a pre-assigned slot of the processor chassis (refer to the processor manual listed in the preface for slot assignment) serves as an interface

between the processor and the flexible disk drive to transfer data, function, and status as requested. One controller interfaces with one or two drives.

FLEXIBLE DISK DRIVE

The flexible disk drive is used as an intermediate mass storage device or as an input device.

INTERFACE CABLE

The interface cable transfers all interface signals between the flexible disk drive and the flexible disk drive controller.

POWER SUPPLIES

Two module power supplies are used with equipments containing Scott power supplies to provide -5 V dc and +24 V dc to the flexible disk drive. In AA132 and AA133 equipments containing an L. H. power supply, one +24 V dc power supply is used; -5 V dc is also obtained from the L. H. power supply.

CARTRIDGE DISK

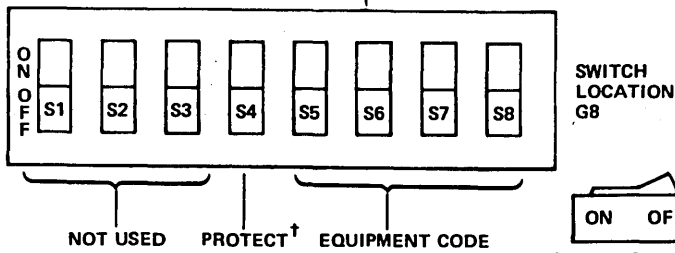
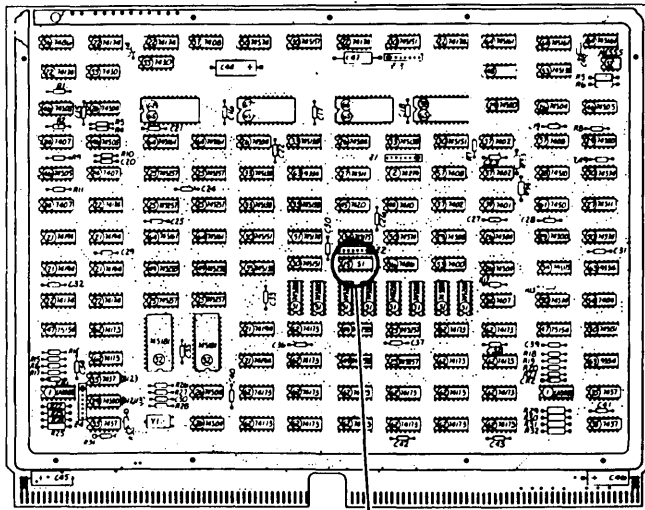
The cartridge disk (diskette) provides the recording and data storage medium for the flexible disk drive. It has 77 tracks of recording surface.

SWITCH SETTINGS, NORMAL OPERATION

The flexible disk drive controller uses a switch block at location G8. This switch block contains eight switches, five of which are used (figure 4-1). Switches 5 through 8 are used to select equipment numbers 0 through F, as shown in the table in figure 4-1. The OFF position corresponds to a 1 for these switches.

Switch 4 is the equipment protect switch. The equipment is protected when this switch is in the ON position. Switches 1, 2, and 3 are not used. The normal position of the protect switch is the ON (protected) position.

FLEXIBLE DISK DRIVE CONTROLLER (COMPONENT SIDE)



†THE NORMAL OPERATING POSITION IS ON.

ADAPTER SWITCHES (LOCATION G8)

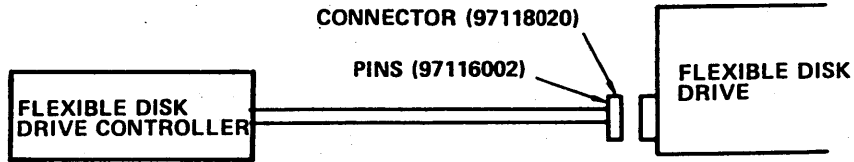
EQUIP- MENT (Q10-07)	S5	S6	S7	S8
0	ON	ON	ON	ON
1	ON	ON	ON	OFF
2	ON	ON	OFF	ON
3	ON	ON	OFF	OFF
4	ON	OFF	ON	ON
5	ON	OFF	ON	OFF
6	ON	OFF	OFF	ON
7†	ON	OFF	OFF	OFF
8	OFF	ON	ON	ON
9	OFF	ON	ON	OFF
A	OFF	ON	OFF	ON
B	OFF	ON	OFF	OFF
C	OFF	OFF	ON	ON
D	OFF	OFF	ON	OFF
E	OFF	OFF	OFF	ON
F	OFF	OFF	OFF	OFF

†NORMAL OPERATING POSITION (ON)

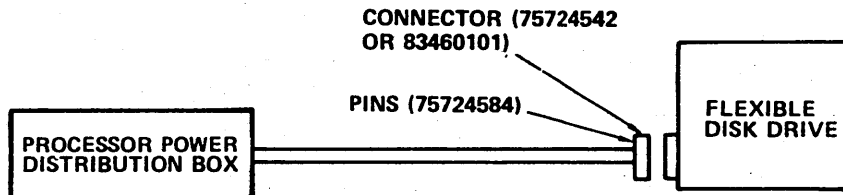
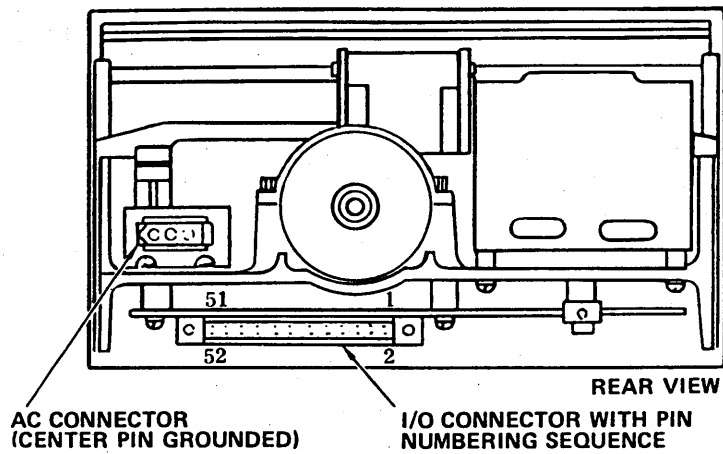
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Figure 4-1. Flexible Disk Drive Controller Switches

This section contains diagrams (figures 5-1 through 5-3) illustrating the flexible disk drive subsystem interconnections and the subsystem connection to the processor.



I/O CABLE ASSEMBLY
(PART NO. 752921xx OR EQUIVALENT)



AC CABLE ASSEMBLY
(PART NO. 96753151 OR EQUIVALENT)

0991

Figure 5-1. Flexible Disk Drive Cable Assemblies

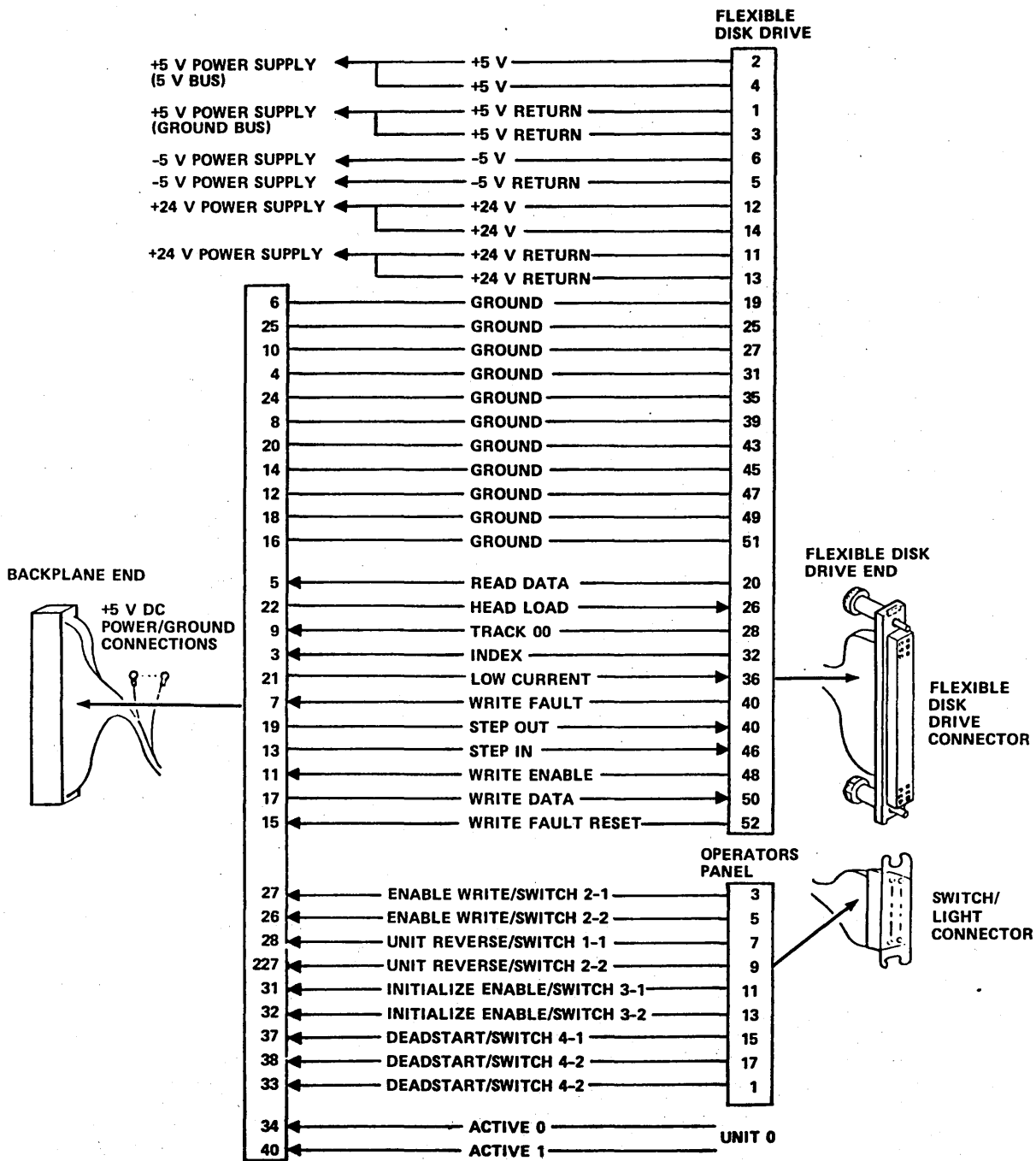


Figure 5-2. Flexible Disk Drive Interface Cable (Unit 0)

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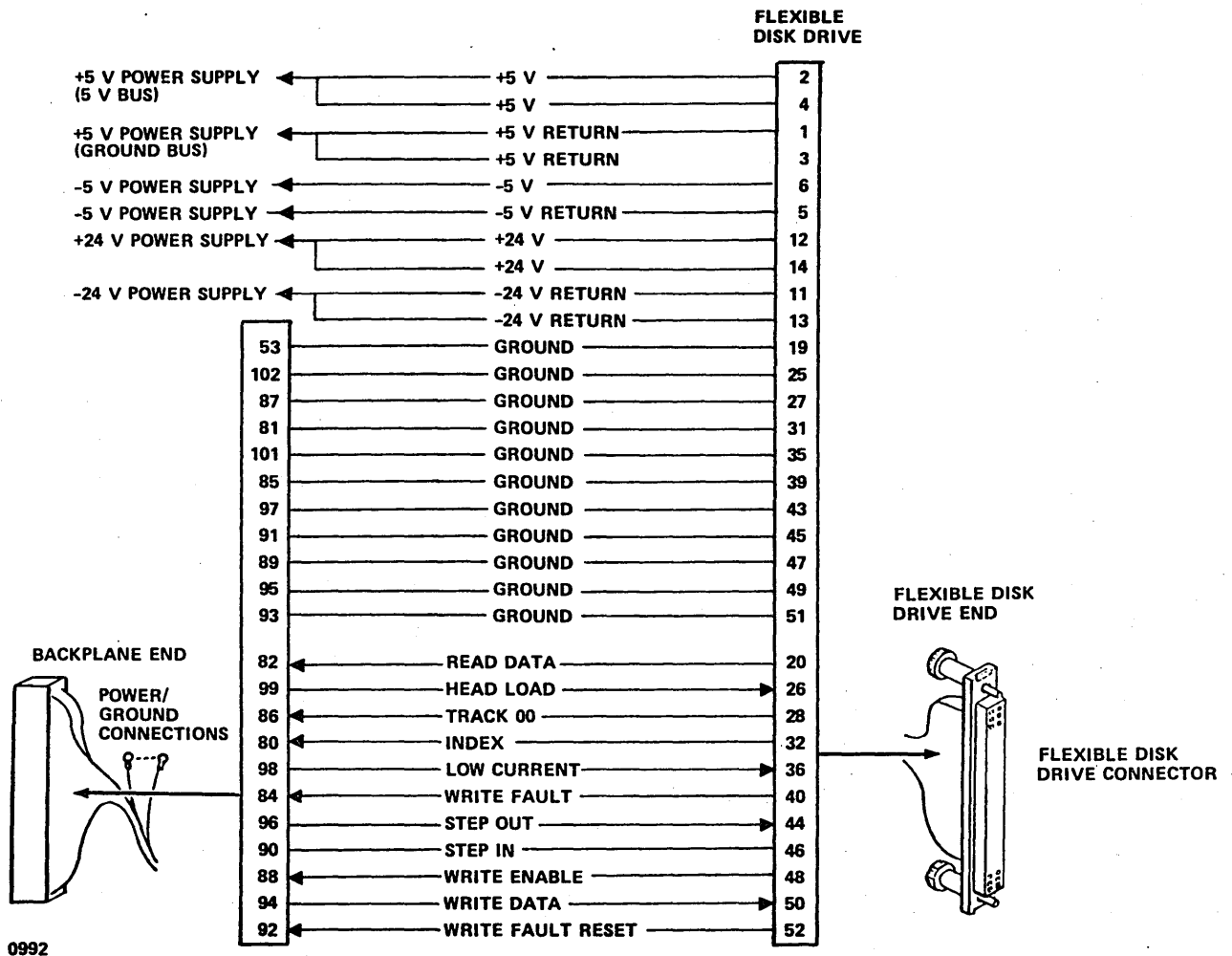
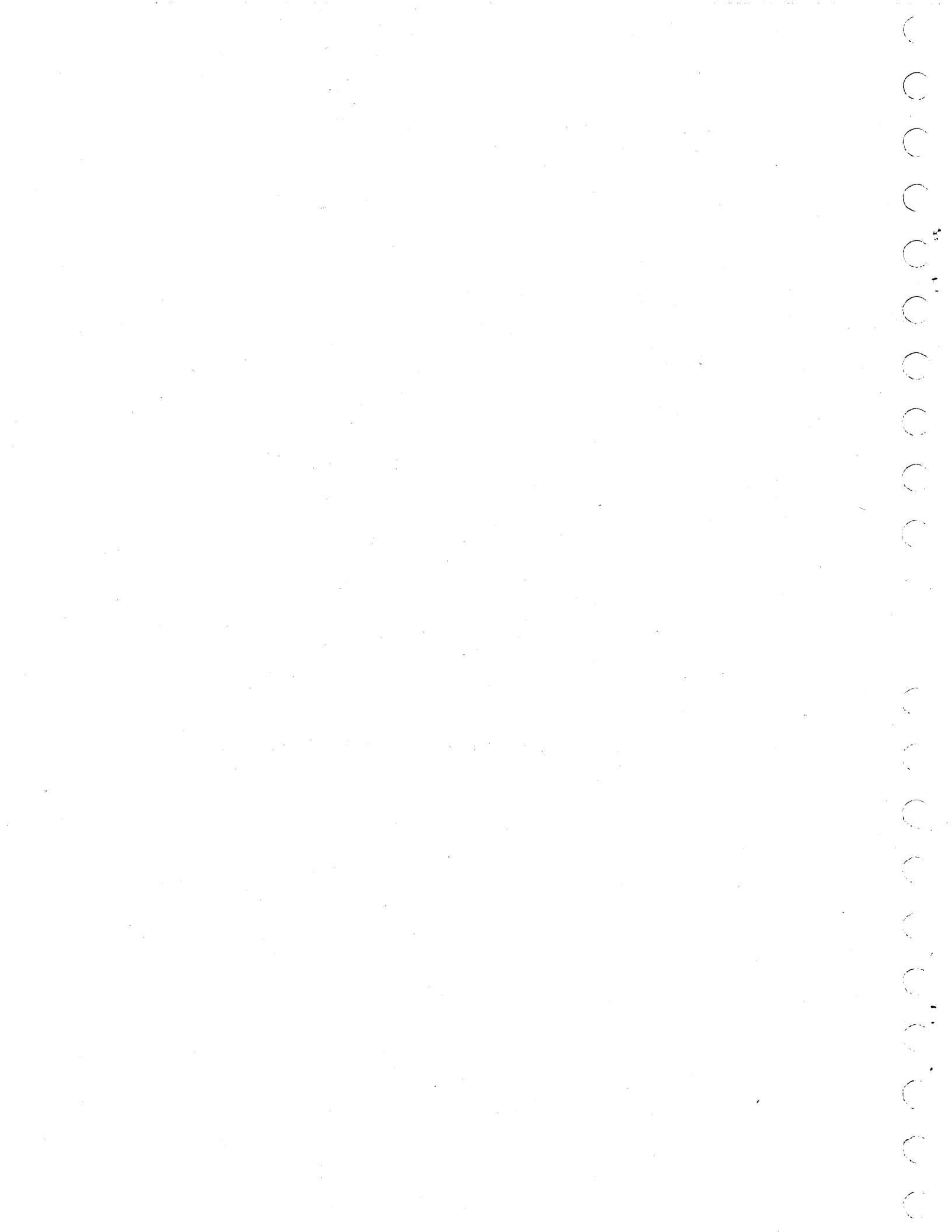


Figure 5-3. Flexible Disk Drive Interface Cable (Unit 1)



This section contains a diagnostic decision logic table (DDLTL) and corrective action procedures applicable to the flexible disk drive subsystem. The DDLTL contains troubleshooting procedures that provide fault isolation of equipment malfunctions. The corrective action procedures provide for step-by-step removal and replacement of defective subassemblies.

The DDLTL procedures consist of offline test sequences and/or the operational diagnostic system (ODS) tests contained on diskettes or cassette tapes. The ODS tests are used in conjunction with the DDLTLs applicable to the subsystem. All ODS tests for a subsystem must use ODS programs contained on the same test medium, either diskettes or cassette tapes. Do not intermix test media during a system checkout.

MAINTENANCE AIDS

Operational diagnostic system (ODS) programs required to test the flexible disk drive subsystem are:

- LDCHK
- FDSKA
- Level II Monitor

For part numbers of the ODS test programs, refer to the overview manual listed in the preface.

MAINTENANCE EQUIPMENT REQUIRED

No maintenance equipment is required other than the normal complement of tools required by site maintenance personnel.

DESCRIPTION OF DIAGNOSTIC DECISION LOGIC TABLES (DDLTLs)

The DDLTLs identify and isolate equipment malfunctions in the replaceable assemblies. The DDLTL analyzes a situation down to specific conditions and then directs the customer engineer to those actions that will correct the situation, with the most likely action listed first. The table is arranged in five sections: assumptions, conditions, responses, actions, and sequence of actions (see the DDLTL example in figure 6-1).

ASSUMPTIONS

The upper section of the DDLTL contains the prerequisites for the specific tests to be performed. The DDLTL is valid only if all assumptions are true.

CONDITIONS

The center left section of the DDLTL contains the conditions or tests to be made. They are in the form of questions that can be answered yes or no.

RESPONSES

The center right section of the DDLTL contains the response to the question asked in the Conditions section. Note that each condition, or question, can be answered with a yes (Y) or a no (N). The example chosen for figure 6-1 has 10 unique situations, numbered from 1 to 10, left to right. The shaded area in the example shows the conditions that define situation 9. That is, the POWER ON indicator does not illuminate, all other indicators do not illuminate when the READ CHECK indicator/switch is pressed, and no single indicator illuminates.

The first condition should be examined for a yes or no response. The applicable response directs the operator to the next condition in the column until all conditions in that column have been analyzed. In figure 6-1, column 1 identifies an everything-is-normal situation for the tests made. Therefore, the Actions section in the lower left of the table directs the customer engineer: Go to sheet 2 of this table. The customer engineer then goes to sheet 2 of the table and does not waste time with further examination of sheet 1.

ACTIONS

The lower left quadrant lists actions to correct a situation.

SEQUENCE OF ACTIONS

The lower right section lists the sequence of the actions required to correct a situation, with each succeeding action being performed only if a previous action failed to correct the condition under test. The sequential numbering of actions reflects the probability of the corresponding action correcting the problem, with the most likely listed first. An X indicates that no sequence of actions is necessary, but the single action listed must be performed. Both actions and conditions may refer to other specific procedures to follow (for example, when checking and adjusting the power supply voltages). The customer engineer must exit from the table to perform the other procedure and then return to the same point in the table to answer any questions that are related to the procedure. He also continues from this point in the table if the fault still persists. The same is true if the customer engineer exits to another table or sheet of the same table but does not find the fault, and the action that called for the exit is not the last action in the sequence. The customer engineer must return to his original DDLTL exit point and continue testing from there.

After taking corrective action, the customer engineer should rerun the DDLTL starting at sheet 1 of that DDLTL table to make sure that the fault has been corrected.

USER NOTES

The following are precautions the customer engineer should keep in mind while performing diagnostic testing:

TABLE 6-51. CARD READER DDLT

Power On	Sheet 1 of 6									
<p>ASSUMPTIONS:</p> <ol style="list-style-type: none"> If card reader is load device, go to sheet 2 of this table. Card reader power cord is connected to ac outlet. Power is on (procedure 1). Ensure card reader is not ready by pressing RESET. 										
<p>CONDITIONS:</p> <ol style="list-style-type: none"> Is POWER ON indicator on card reader illuminated/ Press READ CHECK switch/indicator. Do all other indicators illuminate? Do any indicators illuminate? Press and release RESET switch/indicator. Does RESET indicator illuminate? When RESET switch/indicator is pressed, do stacker springs and/or card drum turn? Did motor power come up and then drop within 10 to 30 seconds after releasing RESET switch/indicator? 										
<p>ACTIONS:</p> <ol style="list-style-type: none"> Go to sheet 2 of this table. Check that toggle switch S1 (rear panel) is up. Check that removable power cord is connected securely to card reader. Check fuses (rear panel) and ac power. Check switch board and associated cabling (procedure 9). Replace if required (procedure 10). Check +17-volt power supply (procedure 6). Check for +17 vdc between ground and control board connector P2, pins 2 and 3, and between ground and switch board connector, pins 2 and 3 (two pins joined by foil). Check cable between control board and switch board. Replace lamp in failing indicator (procedure 9). 										
	1	2	3	4	5	6	7	8	9	10
	Y						N			
	Y				N		Y	N		
					Y	N		Y	N	
	Y		N							
	Y	N								
	X									
									2	
									3	
				3	2	2	2		4	
								1		
								2		
								3		
						1				

RESPONSES

SEQUENCE OF ACTIONS

NOTE: ARROWS AND CIRCLED NUMBERS INDICATE SEQUENTIAL FLOW OF AN ANALYSIS PROCEDURE.

Figure 6-1. Example of a Diagnostic Decision Logic Table

- If the DDLTs are run using a CC628 display terminal, observe the following functional changes when entering information through the keyboard:

To Enter	Press Simultaneously
ETX	CONTROL and C
CLEAR	CONTROL and X
ENTER-	CONTROL and \
ENTER+	CONTROL and [

To Enter	Press Simultaneously
LINE FEED	SHIFT and ↓
CARRIAGE RETURN	CR or NEW LINE
RESET	SHIFT and HOME
RUBOUT	DEL
BEL	CONTROL and G

- After any power to the computer is turned on or off, the computer should be master cleared.

- Power to the peripherals should be turned off before the power to the computer is turned off.
- Printed wiring assemblies may be removed from or installed in the processor with the power on.
- Do not press any key on the keyboard while diagnostic media is being loaded.

Whenever the ESC key on the keyboard is pressed, the computer is placed into panel mode. This prevents further messages from being displayed on the screen. To a user it appears that the system is hung up. If the ESC key is accidentally pressed, the condition can be rectified by pressing the character on the keyboard.

The DDLTs presume all operator inputs are entered correctly. Any incorrect entry may cause the DDLT to direct an incorrect action. Hence, if any doubt exists about the accuracy of the operator entry, always repeat the sequence of DDLT steps that led up to an action before taking further actions.

If any characters are accidentally pressed on the keyboard, the KEYBOARD LOCK and ALERT lights on the display illuminate. If this occurs, the BREAK key must be pressed to continue.

ODS SOFTWARE

For additional information regarding the use of the ODS diagnostic tests, refer to the Operational Diagnostic System Reference Manual. Excerpts from this manual are listed below.

If an erroneous test entry is made and executed during a Level II† test, perform the following:

1. Simultaneously press the CONTROL and BEL keys on the console display.
2. Type in:

ODS,ABRT,xxxxx

where xxxxx is the five-digit ODS test mnemonic.
3. Press the CARRIAGE RETURN key. The remainder of the test loads.
4. Reload the test and return to the DDLT (sheet 1) of the device under test.

NOTE

If step 2 above cannot be performed, restart the Loadcheck diagnostic (in the processor manual listed in the preface).

For error code typeouts not listed in the DDLTs, refer to the following:

Typeout	Description
GHOST INTERRUPT LINES xxxx	Level I tests. An unexpected interrupt was received. xxxx = A bit mask indicating which line was interrupted
MI	Level II tests. A manual interrupt (CONTROL and BEL) has been received, and the system is waiting for the ODS level II command.
MI INPUT ERROR	Level II tests. The command did not begin with ODS. Press CONTROL and BEL and then re-enter the command.
ODS BUSY	Level II tests. ODS is currently processing the last command entered. Re-enter the command.
ODS ERROR xx	Level II tests. An operator command input error occurred during loading of the test or while the test was not processing. Re-enter the command correctly. xx = 01 Invalid command mnemonic 02 Third field must be entered 03 Invalid test availability 04 Command is not valid for the master parameter list 05 Too many field inputs for the command 06 Nonhexadecimal input 07 Invalid parameter 08 Invalid parameter index 09 Test not currently suspended 10 No change in parameter data input

† Level II tests are subsystem diagnostic programs that run under the ODS monitor and are loaded by the Level II Monitor DDLT contained in the processor manual listed in the preface.

<u>Typeout</u>		<u>Description</u>
ODS ERROR xx	xx = 11	Available memory has been exceeded
	12	Test not found on library unit
OV		Level II tests. An overflow of the monitor's usable memory has occurred. Reload the system.
PE		Level II tests. A macro MOS parity fault interrupt has occurred. Reload the system.

<u>Typeout</u>	<u>Description</u>
PF	Level II tests. A protect fault interrupt has occurred. Reload the system.
PW	Level II tests. A power failure protect interrupt has occurred. Reload the system.
Table 6-1 is the DDLT for the flexible disk drive subsystem. The removal/replacement and testing procedures immediately follow the DDLT.	

TABLE 6-1. FDSKA: FLEXIBLE DISK DDLT (Sheet 1 of 4)

ASSUMPTIONS

1. The Loadcheck and Instruction Test DDLTs in the processor field repair guide have been successfully completed.
2. The level II monitor is loaded (see the Level II Monitor DDLT in the processor field repair guide listed in the preface.)
3. If there are two flexible disk drives (unit 0 and unit 1) in the system, they are tested in one pass.
4. A suitable scratch diskette (CDC part no. 96820413 or equivalent) is available for each drive.
5. The following is entered at the keyboard:
 Press CONTROL and BEL simultaneously.
 Type ODS,LOAD,FDSKA
 Press CARRIAGE RETURN
 FDSKA SUSPENDED LOAD is displayed.
6. The WRITE ENABLE, INIT ENABLE and UNIT REVERSE indicators are not illuminated.
7. If the load device is a flexible disk, the ODS diskette has been removed from unit 0. If the load device is not a flexible disk, the user has changed the FDSKA parameters in accordance with procedure 11 in this section.

CAUTION

This must be done before FDSKA is allowed to begin execution.

CONDITIONS	1	2
	1. Are two drives available on the system to be tested?	Y
ACTIONS		
1. Press CONTROL and BEL simultaneously. Type ODS,CPAR,FDSKA,A.2 Press CARRIAGE RETURN	1	
2. Press CONTROL and BEL simultaneously. Type ODS,GO,FDSKA Press CARRIAGE RETURN	2	1
3. In response to the request to do so, insert a scratch diskette into each drive being tested.	3	2
4. Press the WRITE ENABLE switch on the control panel. The WRITE ENABLE indicator should illuminate.	4	3
5. Press CONTROL and BEL simultaneously. Type ODS,GO,FDSKA Press CARRIAGE RETURN	5	4
6. Perform the actions requested by the test on the CRT within the 30 seconds allowed.	6	5
7. Go to sheet 2 of this table.	7	6

TABLE 6-1. FDSKA: FLEXIBLE DISK DDLT (Sheet 2 of 4)

ASSUMPTIONS					
CONDITIONS	1	2	3	4	5
	1. Does the screen display: FDSKA COMPLETED 0001 PASSES FDSKA TERMINATED 0000 ERRORS 2. Is the flexible disk drive controller being used as a DMA device? (If it is not a DMA device, then it must be an A/Q device.) Refer to section 4 of the processor field repair guide 3. Is an action code displayed? 4. Is the action code an even number?	Y	<input type="checkbox"/>	N	
	Y	N			
			Y		N
			Y	N	
ACTIONS					
1. Remove the scratch diskette(s).	1	1			
2. Press the WRITE ENAB. switch on the control panel. The WRITE ENAB. indicator should extinguish.	2	2			
3. Re-insert the ODS diskette (if the ODS load device is a diskette).	3	3			
4. Go to table 6-2 to test the DMA portion using FDSKU.	4				
5. Go to next subsystem test.		4			
6. Go to sheet 3 of this table.			X		
7. Go to sheet 4 of this table.				X	
8. Go to the System Fault DDLT in the processor field repair guide.					X

TABLE 6-1. FDSKA: FLEXIBLE DISK DDLT (Sheet 3 of 4)

ASSUMPTIONS		
The screen displays one or more action codes.		
CONDITIONS	1	2
1. Does one or more of the following action codes appear: 1F10 or 1F12 or 1F14 or 1F16 or 1F18 or 1F20 or 1F22 or 1F28 or 1F30 or 1F40 or 1F44 or 1F50 or 1FA0 or 1FB0	Y	N
ACTIONS		
1. Use another diskette in unit 0.	2	1
2. Check power supply voltages (procedure 5).	3	2
3. Check flexible disk drive controller cable.	4	3
4. Replace flexible disk drive unit 0 (procedure 9).	6	4
5. Replace flexible disk drive controller (procedure 10).	5	5
6. Call next level of support.	7	6
7. Verify equipment/interrupt assignment (see the assignment procedure in the processor field repair guide).	1	

TABLE 6-1. FDSKA: FLEXIBLE DISK DDLT (Sheet 4 of 4)

ASSUMPTIONS		
The screen displays one or more of the action codes listed under Conditions.		
CONDITIONS	1	2
	Y	N
1. Does one or more of the following action codes appear: 1F11 or 1F13 or 1F15 or 1F17 or 1F19 or 1F21 or 1F23 or 1F29 or 1F31 or 1F41 or 1F45 or 1F51 or 1FA1 or 1FB1		
ACTIONS		
1. Use another diskette in unit 1.	1	1
2. Check power supply voltages (procedure 5).	2	2
3. Check flexible disk drive controller cable.	3	3
4. Replace flexible disk drive unit 1 (procedure 9).	5	4
5. Replace flexible disk drive controller (procedure 10).	4	5
6. Call next level of support.	6	6

TABLE 6-2. FDSKU: FLEXIBLE DISK DDLT (Sheet 1 of 4)

ASSUMPTIONS

1. Entry is made from table 6-1.
2. The level II monitor is loaded (see the Level II Monitor DDLT in the processor field repair guide listed in the preface.)
3. If there are two flexible disk drives (unit 0 and unit 1) in the system, they are tested in one pass.
4. A suitable scratch diskette (CDC part no. 96820413 or equivalent) is available for each drive.
5. The following is entered at the keyboard:
 Press CONTROL and BEL simultaneously.
 Type ODS,LOAD,FDSKU
 Press CARRIAGE RETURN
 FDSKU SUSPENDED LOAD is displayed.
6. The WRITE ENABLE, INIT ENABLE and UNIT REVERSE indicators are not illuminated.
7. If the load device is a flexible disk, the ODS diskette has been removed from unit 0. If the load device is not a flexible disk, the user has changed the FDSKU parameters in accordance with procedure 11 in this section.

CAUTION

This must be done before FDSKU is allowed to begin execution.

CONDITIONS	1	2
	Y	N
1. Are two drives available on the system to be tested?		
ACTIONS		
1. Press CONTROL and BEL simultaneously. Type ODS,CPAR,FDSKU,A.2 Press CARRIAGE RETURN	1	
2. Press CONTROL and BEL simultaneously. Type ODS,CPAR,FDSKU,3,ABCO Press CARRIAGE RETURN	2	1
3. Press CONTROL and BEL simultaneously. Type ODS,GO,FDSKU Press CARRIAGE RETURN	3	2
4. In response to the request to do so, insert a scratch diskette into each drive being tested.	4	3
5. Press the WRITE ENABLE switch on the control panel. The WRITE ENABLE indicator should illuminate.	5	4
6. Press CONTROL and BEL simultaneously. Type ODS,GO,FDSKU Press CARRIAGE RETURN	6	5
7. Go to sheet 2 of this table.	7	6

TABLE 6-2. FDSKU: FLEXIBLE DISK DDLT (Sheet 2 of 4)

ASSUMPTIONS				
CONDITIONS 1. Does the screen display: FDSKU COMPLETED 0001 PASSES FDSKU TERMINATED 0000 ERRORS 2. Is the action code displayed? 3. Is an action code an even number?	1	2	3	4
	Y	N		
		Y		N
		Y	N	
ACTIONS				
1. Remove the scratch diskette(s).	1			
2. Press the WRITE ENAB. switch on the control panel. The WRITE ENAB. indicator should extinguish.	2			
3. Re-insert the ODS diskette (if the ODS load device is a diskette).	3			
4. Go to next subsystem test.	4			
5. Go to sheet 3 of this table.		X		
6. Go to sheet 4 of this table.			X	
7. Go to the System Fault DDLT in the processor field repair guide.				X

TABLE 6-2. FDSKU: FLEXIBLE DISK DDLT (Sheet 3 of 4)

ASSUMPTIONS		
The screen displays one or more action codes.		
CONDITIONS	1	2
1. Does one or more of the following action codes appear: 1F10 or 1F12 or 1F14 or 1F16 or 1F18 or 1F20 or 1F22 or 1F28 or 1F30 or 1F40 or 1F44 or 1F50 or 1FA0 or 1FB0	Y	N
ACTIONS		
1. Use another diskette in unit 0.	2	1
2. Check power supply voltages (procedure 5).	3	2
3. Check flexible disk drive controller cable.	4	3
4. Replace flexible disk drive unit 0 (procedure 9).	6	4
5. Replace flexible disk drive controller (procedure 10).	5	5
6. Call next level of support.	7	6
7. Verify equipment/interrupt assignment (see the assignment procedure in the processor field repair guide).	1	

TABLE 6-2. FDSKU: FLEXIBLE DISK DDLT (Sheet 4 of 4)

ASSUMPTIONS		
The screen displays one or more of the action codes listed under Conditions.		
CONDITIONS	1	2
1. Does one or more of the following action codes appear: 1F11 or 1F13 or 1F15 or 1F17 or 1F19 or 1F21 or 1F23 or 1F29 or 1F31 or 1F41 or 1F45 or 1F51 or 1FA1 or 1FB1	Y	N
ACTIONS		
1. Use another diskette in unit 1.	1	1
2. Check power supply voltages (procedure 5).	2	2
3. Check flexible disk drive controller cable.	3	3
4. Replace flexible disk drive unit 1 (procedure 9).	5	4
5. Replace flexible disk drive controller (procedure 10).	4	5
6. Call next level of support.	6	6

PROCEDURES

1 POWER TURN-ON

The flexible disk drive gets its ac power from the processor power distribution system, which is controlled by the POWER ON/OFF switch located on the cabinet to the right of the control panel.

To turn on the flexible disk drive, perform the following:

1. Set the cabinet POWER ON/OFF switch to the ON position. The spindle begins to rotate.
2. Open the door and insert the diskette (procedure 3).
3. Close the door. The drive engages the diskette and it starts to turn. Upon command from the processor, the heads load.
4. If more than one flexible disk drive is included in the system, select the desired flexible disk drive by pressing the UNIT REV. switch on the processor control panel. When the switch is off, unit 0 is selected. When the switch is on, unit 1 is selected.
5. The flexible disk drive is now ready for use.

2 POWER TURN-OFF

The flexible disk drive ac power is supplied from the processor power distribution system which is controlled by the POWER ON/OFF switch located on the cabinet to the right of the operators panel. Therefore, in order to turn off power to the flexible disk drive, power must also be turned off on the processor.

To turn off the flexible disk drive, perform the following:

1. Open the flexible disk drive door and remove the diskette, if present. If there is more than one flexible disk drive in the system, remove the diskette from the other flexible disk drives (procedure 4).
2. Press MASTER CLEAR on the processor control panel.
3. Set the POWER ON/OFF switch on the cabinet to OFF.

3 DISKETTE LOADING

To load the diskette, perform the following:

1. Apply ac/dc power to the unit (procedure 1).
2. Open the flexible disk drive door.
3. Remove the diskette from the storage envelope as shown in figure 6-2.
4. Carefully slide the diskette into the flexible disk drive until the jacket is solidly against the stops, inserting the diskette as shown in figure 6-2.

5. Carefully close the flexible disk drive door.
6. Protect the empty storage envelope from liquids, dust, and metallic materials.

4 DISKETTE REMOVAL/HANDLING RECOMMENDATIONS

To remove the diskette, perform the following:

1. Open the flexible disk drive door to stop disk rotation and disengage the spindle.
2. Remove the disk from the flexible disk drive and put it in its storage envelope. Follow the recommended handling procedure below.

Since the recorded surface contains vital information, reasonable care should be exercised in its handling. Longer disk life and trouble-free operation results if the following recommendations are followed:

1. Do not use a writing device that deposits flakes (in other words, lead or grease pencils) when writing on the jacket label.
2. Do not fasten paper clips to the jacket edges.
3. Do not touch the surface exposed by the jacket slot.
4. Do not clean the diskette in any manner.
5. Keep the diskette away from the magnetic field and from ferromagnetic materials that may be magnetized.
6. Return the diskette to the envelope when removed from the flexible disk drive.
7. Protect the diskette from liquids, dust, and metallic substances at all times.
8. Do not exceed the following storage environmental conditions:

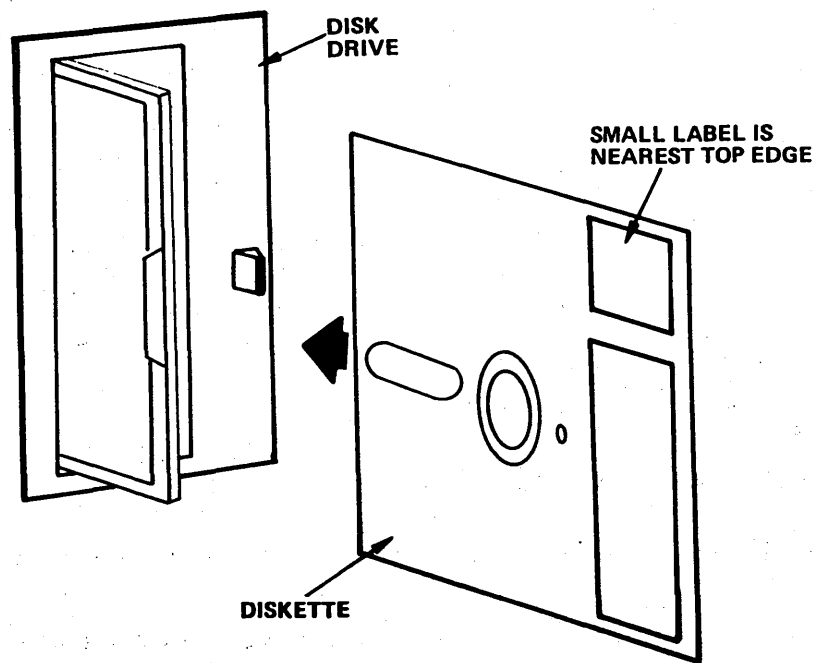
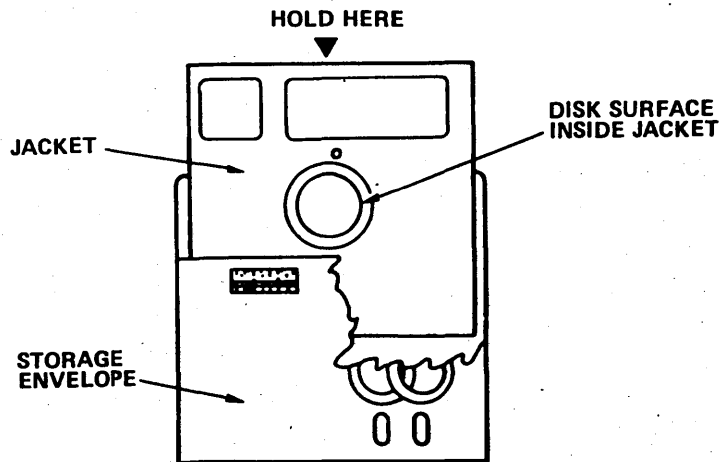
Temperature	50° to 125°F (10° to 52°C)
Relative humidity	8 to 80%
Maximum wet bulb	85°F (29°C)
9. The diskette should be stored when not in use.

5 POWER SUPPLY VOLTAGES CHECK

Processors that contain Scott power supply modules also contain a -5 V dc power supply for the flexible disk drive logic. Processors housed in AA132 or AA133 cabinets with L. H. power supply obtain -5 V dc power for the flexible disk drive logic from the L. H. power supply.

To check the power supply voltages, refer to figure 6-3 for test points, and perform the following:

1. Grasp the bottom of the front panel on the processor cabinet and remove it by pulling it out.
2. Release the latches and pull the equipment mounting frame forward.



0994-1

Figure 6-2. Disk Installation

3. Remove the five mounting screws from the base of the cover and remove the cover from the power supplies.
4. Using a dc voltmeter set to the 30 V dc scale, place the negative lead on the RET test point and the positive

lead on the +24 V dc test point. Verify that the power supply puts out +24 V dc ± 10 percent. Make the necessary adjustments by turning the potentiometer. If the power supply cannot be adjusted to get proper voltage, replace the power supply (procedure 6).

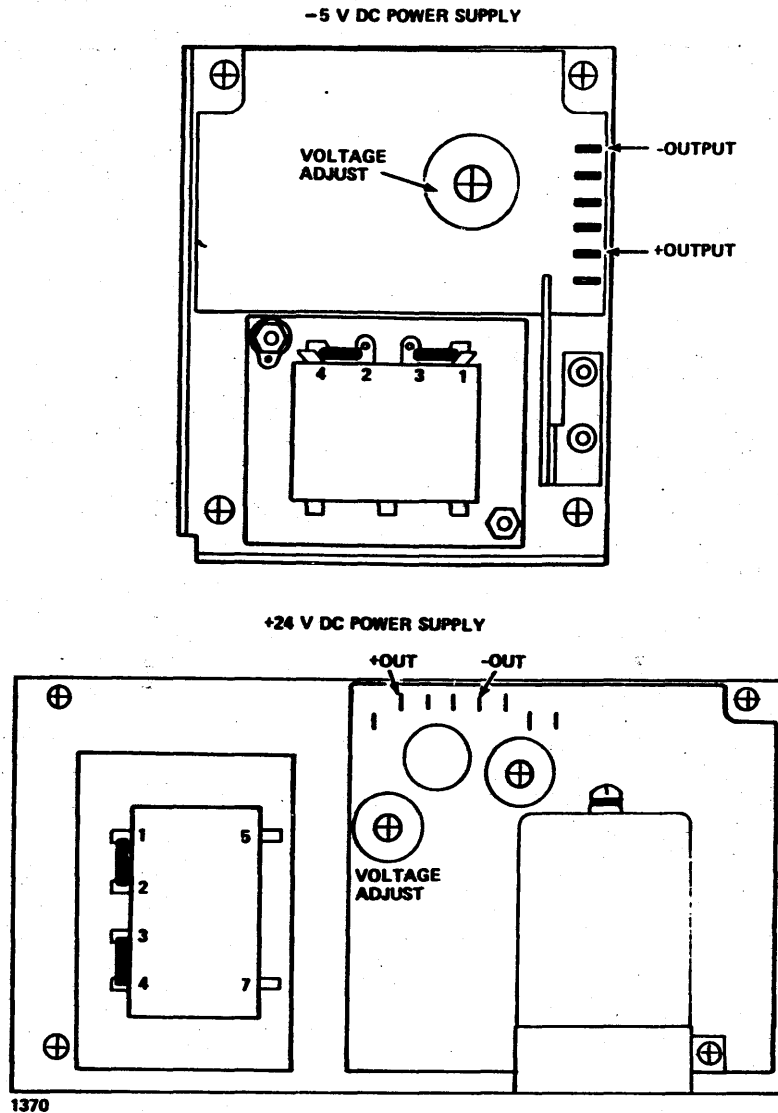


Figure 6-3. Flexible Disk Drive Dc Power Supplies Test Points

This -5 V dc check is applicable only to processors that contain a Scott power supply.

5. Using a dc voltmeter set to the 15 V dc scale, place the negative lead on the -5 V dc test point and the positive lead on the RET test point. Verify that the power supply puts out -5 V dc ± 5 percent. Make the necessary adjustments by turning the potentiometer. If the power supply cannot be adjusted to meet the specification, replace the power supply (procedure 7).
6. Remove the meter leads and restore the mounting frame and front panel to their original positions.

6 24 VDC POWER SUPPLY REPLACEMENT

The 24 V dc power supply is located on a mounting plate above the flexible disk drive and is exposed when the

processor equipment mounting frame is released and moved forward. See figure 6-3.

To replace the 24 V dc power supply, disconnect ac power to the processor and perform the following:

1. Remove the front panel from the processor cabinet by grasping and pulling it at the bottom.
2. Release the latches and pull the equipment mounting frame forward.
3. Remove the five mounting screws around the base of the cover and remove the cover from the power supplies.
4. Identify the wires and remove them from the power supply.

5. Remove the three mounting screws from the base of the power supply. Remove the power supply.
6. Install the new power supply in the vacated position in the same orientation as before.
7. Reconnect the wires to the power supply.
8. Restore power to the processor and test the new power supply according to procedure 5.

7 -5 VDC POWER SUPPLY REPLACEMENT

This procedure is applicable only to processors that contain a Scott power supply.

The -5 V dc power supply is located on a mounting plate above the flexible disk drive and is exposed when the processor equipment mounting frame is released and moved forward. See figure 6-3.

To replace the -5 V dc power supply, disconnect ac power to the processor and perform the following:

1. Remove the front panel from the processor cabinet by grasping and pulling it at the bottom.
2. Release the latches and pull the equipment mounting frame forward.
3. Remove the five screws from the base of the cover and remove the cover from the power supply.
4. Identify the wires and remove them from the power supply.
5. Remove the three mounting screws from the base of the power supply. Remove the power supply.
6. Install the new power supply in the vacated position in the same orientation as before.
7. Reconnect the wires to the power supply.
8. Restore power to the processor and test the new power supply according to procedure 5.

8 HEAD CLEANING

To clean the read/write head on the flexible disk drive, perform the following:

1. Remove the flexible disk drive according to procedure 9.
2. Remove the cover from the flexible disk drive.
3. Clean the head as outlined below.

CAUTION

Do not smoke while cleaning. Do not touch a head face with fingers. Do not leave residue or lint on the head faces. Trapped residual particles can result in the loss of a head and/or a scored disk.

- a. Use lint-free gauze to lightly drybuff the head face. Cleaning is completed if deposits are removed.
- b. If oxide deposits were not removed in step a, use dry gauze to lightly buff the head face. Dampen (do not soak) gauze with head cleaning solution (91 percent isopropyl alcohol) and wipe the head face.

4. Replace the cover on the flexible disk.
5. Reinstall the flexible disk drive according to procedure 9.

9 FLEXIBLE DISK DRIVE REPLACEMENT

To replace the flexible disk drive, perform the following:

1. Remove the diskette from the drive, if present.
2. Remove the front cover from the processor cabinet.
3. Release the latches and lower the equipment mounting frame.
4. Note the location of the cables and disconnect them from the drive (figure 6-4).
5. Remove the bottom mounting screw from the drive.
6. Raise the equipment mounting frame and remove the top mounting screw from the drive.
7. Pull the drive forward, remove it from its mounting bracket, and replace it with a new drive.

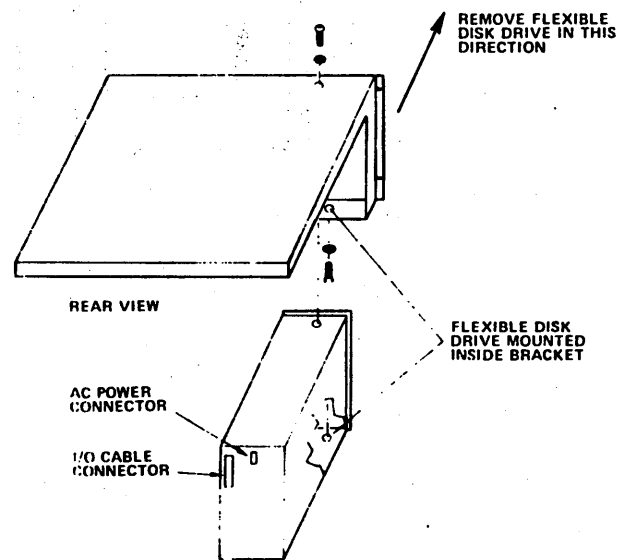


Figure 6-4. Flexible Disk Drive Mounting

8. Install the mounting screws.
9. Reconnect the cables to their proper connectors on the new drive.
10. Test the new flexible disk drive according to DDLT requirements.

10 FLEXIBLE DISK DRIVE CONTROLLER REPLACEMENT

1. Remove the diskette from the flexible disk drive, if present.
2. Remove the panel from the processor cabinet.
3. Remove the cover panel from the processor logic chassis.
4. Using the extractor tool, remove the controller from the logic chassis. Refer to the processor manual for location.
5. Verify that the equipment code and function switches are set to their normal operating positions on the new controller. Refer to figure 4-1 for switch location.
6. Position the new controller in its assigned position within the processor logic chassis with the component side facing left.
7. Seat the controller into its backplane connector by applying firm pressure at the top and bottom of the controller.
8. Replace the extractor, the cover panel, and the cabinet panel.
9. Perform the diagnostic test procedure for the flexible disk drive.

11 CASSETTE/DISKETTE RUN PARAMETERS (NONSTANDARD CONFIGURATIONS)

Standard CYBER systems support either diskettes or cassettes, but not both. In systems that have both diskettes and cassettes, the standard ODS load device is the diskette. If the CASEC or CASET tests are being run with the diskette as the load device, or if the FDSKA test is being run with the cassette as the load device, the run parameters must be modified as follows.

1. Remove the side panel from the cabinet of the processor being tested.

2. Examine the FCO tags for the A/Q-DMA slots and determine the location of the flexible disk drive controller.
3. Remove the flexible disk drive controller and determine the equipment code by comparing the equipment code switch setting with the controller switch setting of figure 4-1.
4. Press CONTROL and BEL simultaneously. Type ODS,CPAR,FDSKA,8,tt (where tt corresponds to the micro/macro interrupt line). Press CARRIAGE RETURN.
5. Press CONTROL and BEL simultaneously. Type ODS,CPAR,FDSKA,7,vvvv (where vvvv is the parameter in table 6-3 corresponding to the equipment code). Press CARRIAGE RETURN.
6. Return to table 6-1 or table 6-2 and continue the normal DDLT testing sequence.

TABLE 6-3. RUN PARAMETERS

Equipment Code	Parameter vvvv
0	0001
1	0081
2	0101
3	0181
4	0201
5	0281
6	0301
7	0381
8	0401
9	0481
A	0501
B	0581
C	0601
D	0681
E	0701
F	0781

PARTS DATA

Table 7-1 lists the replaceable assemblies and their part numbers for the flexible disk drive subsystem.

TABLE 7-1. PARTS DATA FOR FLEXIBLE DISK DRIVE

Assembly	Equipment No.	Spare Part	Part No.
Flexible disk drive	BR803-U	Assembly	75744052
	GD130-A	Power supply, 24 V dc	96753485
	GD308-A	Power supply, 5 V dc	96753484
Flexible disk drive controller	FA730-A	Printed wiring assembly	96870860
		Operator panel (part of 18-20 main frame)	96752815
	YA137-A	Unit 0 I/O cable	96750510
	All others	Unit 0 I/O cable	88951487
	YA138	Unit 1 I/O cable	96750511
	All others	Unit 1 I/O cable	88951492
Cartridge disk (diskette), CDC format			96820413

1954

1954



COMMENT SHEET

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Hardware Maintenance Manual

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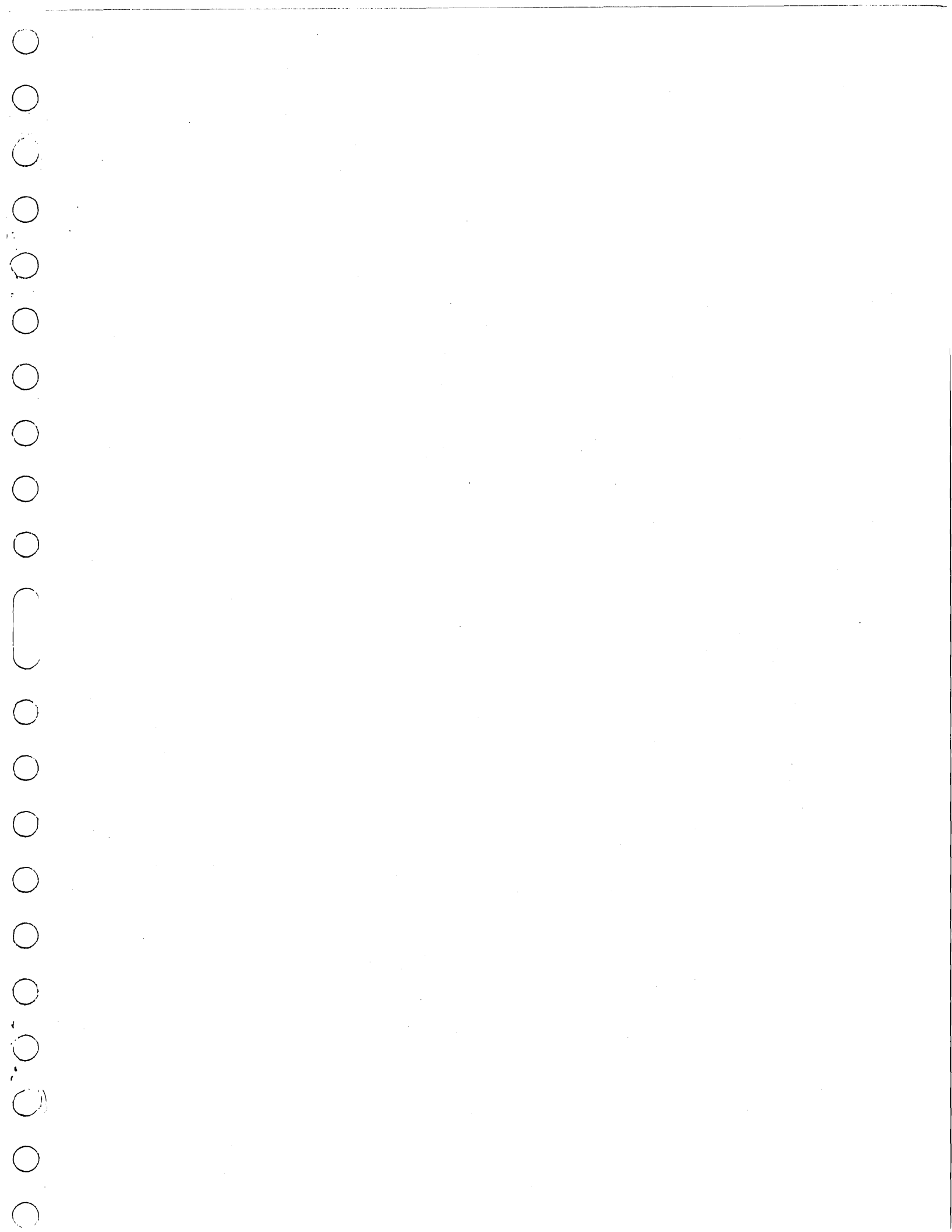
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