

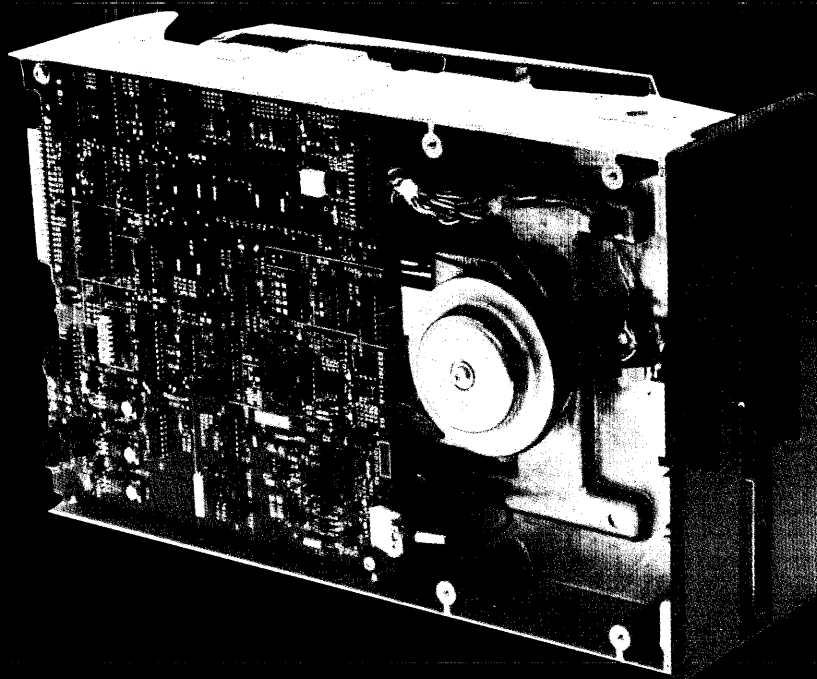
SIEMENS

OEM

Floppy Disk Drive FDD 100-8

Technical Manual
Volume 2 Model 100-8D

MAINTENANCE
ILLUSTRATED PARTS BREAKDOWN
DIAGRAMS



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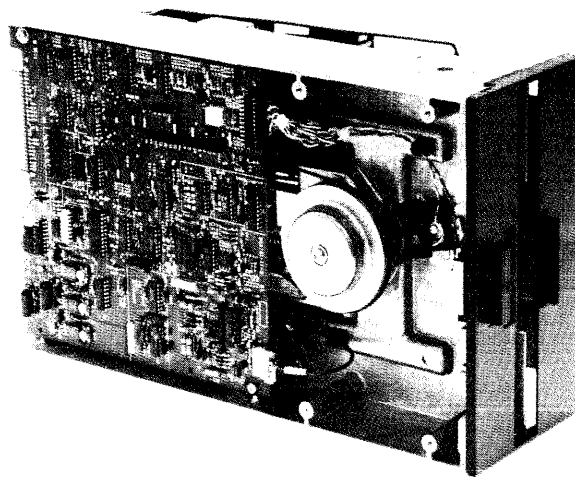


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SECTION 1 MAINTENANCE

GENERAL

This manual contains preventive and corrective maintenance information necessary to maintain the Model FDD 100-8D Floppy Disk Drive (Figure 1-1). The procedural information is provided for operational checks, adjustments or alignments, and removal and replacements.

PREVENTIVE MAINTENANCE

Preventive maintenance of the disk drive is minimal due to the efficient design, reliability, and manner in which the unit is operated.

The operating environment of the disk drive and the flexible disks must be kept clean and within required temperature and humidity limits. The single read/write head must be kept free from contamination by dust, smoke, or moisture.

Visual Inspection

During normal operating conditions, periodically inspect the unit for signs of dirt, wear, or loose latching hardware. When servicing the unit, check all areas for signs of loose connections, abnormal wear, and dirt accumulation on the floppy disk guide.

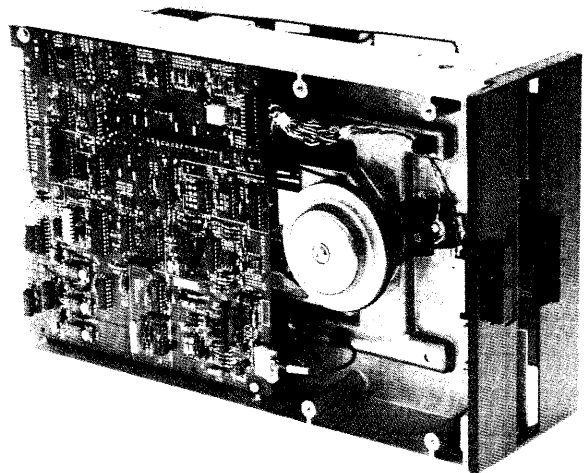


Figure 1-1. Model FD 100-8D

Cleanliness

A clean disk drive, external and internal, will extend the operating life of the equipment and enhance the appearance. The importance of periodic visual inspection and normal cleanliness of the unit cannot be over-emphasized.

Routine Maintenance Schedule

A systematic routine operating check is recommended. The checks should be performed in accordance with Table 1-1.

Table 1-1. Routine Maintenance Schedule

Inspect	Check	Frequency
R/W Head	For Dirt	} Every six months
Head Pad	For Wear	
Drive Belt	For Tension	

TOOLS AND TEST EQUIPMENT

To perform maintenance of the disk drive, certain tools, test equipment and supplies are required. A list of standard tools and test equipment is provided in Table 1-2. A list of special tools and test equipment is provided in Table 1-3.

Standard

Table 1-2. Tools and Test Equipment

Oscilloscope
Voltohmmeter
Common Hand Tools
Flashlight
Inspection Mirror
Cotton-Tipped Swabs
Isopropyl Alcohol
Lint-Free Cloths

Special

Table 1-3. Tools and Test Equipment

Torque Driver with Torx T15 and T20 bits and a 0.094 Hex Key
Alignment Floppy Disk, DYSAN 360
Gauge, Inner Stop C22256-A100-B002
Exerciser S22740-P101-A001

CORRECTIVE MAINTENANCE

Corrective maintenance of the disk drive involves on-line checks to determine the cause of a suspected malfunction. An adjustment or alignment may be required to restore the unit to operational readiness, or a removal and replacement may be required.

The following maintenance procedures are provided to determine and correct any suspected malfunction in the disk drive.

Note

It is recommended that prior to starting any operation or maintenance procedure, maintenance personnel read the entire procedure to fully understand the details of the procedure and the tools required.

Input Power

The disk drive uses one ac drive voltage and two dc voltages. The input power is supplied by the controller during normal on-line operations.

WARNING

Use extreme care when measuring, or connecting ac line power. Electric shock could occur to injure personnel and damage equipment.

Voltage Checks

Initial voltage checks are made with the disk drive connected to the controller to determine if correct input voltages are being supplied.

To check input ac and dc voltages:

- a. Gain access to disk drive ac connector J1.
- b. Using voltohmmeter, verify that ac input voltage measures same as voltages listed in Table 1-4.
- c. Gain access to dc connector J2.
- d. Using voltohmmeter, verify that dc input voltage measures same as voltages listed in Table 1-5.

Table 1-4. Ac Power Requirements

Pin No. (P1)	60 Hertz		50 Hertz	
	115V	230V	115V	230V
1	90-127 Vac	180-253 Vac	90-127 Vac	180-253 Vac
2	Frame Gnd	Frame Gnd	Frame Gnd	Frame Gnd
3	Ac Ret	Ac Ret	Ac Ret	Ac Ret
I _{Max}	0.3 Amps	0.15 Amps	0.4 Amps	0.2 Amps
Frequency Tolerance	±0.5 Hertz		±0.5 Hertz	

Table 1-5. Dc Power Requirements

Pin No. (P2)	Dc Voltage	Tolerance	Current	Maximum Ripple (p-p)
1	+24 Vdc	±1.2 Vdc	1.8A Max.	100 mv
2	+24V Ret	-	-	-
5	+5 Vdc	±0.25 Vdc	1.0A Max.	50 mv
6	+5 Ret	-	-	-

Voltage Adjustments

Voltage adjustments are not provided in the disk drive. If any dc voltage is out of tolerance, disconnect dc and interface cable and check voltages at controller. If controller dc voltages are correct:

- a. Disconnect disk drive cables.
- b. Remove disk drive and place on clean work surface.
- c. Isolate dc voltage problem on printed circuit board, and repair. Replace PCB if necessary. Refer to Printed Circuit Board Replacement procedure.

Spindle Drive System

The spindle drive system consists of the drive motor, drive motor pulley, the spindle drive pulley and the drive belt, as shown in Figure 1-2. The INDEX pulse detector is considered part of the drive system. Refer to Index Pulse Detector Check, if necessary.

Drive Motor and Drive Belt Checks

To check the drive motor and drive belt:

- a. Turn off all ac and dc input power.
- b. Gain access to PCB side of disk drive.
- c. Rotate drive motor manually and inspect drive belt for wear, cracks, or fraying edges. Replace drive belt, if necessary. Refer to Drive Belt Replacement procedure.
- d. Rotate motor manually and inspect for bearing noises or binding. Replace drive motor, if necessary. Refer to Drive Motor Replacement procedure.
- e. Turn on ac line power to disk drive.
- f. Verify that new drive motor and/or new drive belt operates normally, and that drive belt tracks smoothly and evenly in center of both pulleys. If tracking is irregular, refer to Drive Belt Adjustment procedure.

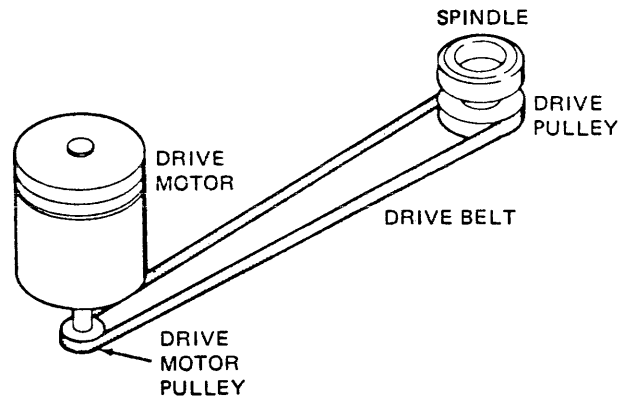


Figure 1-2. Spindle Drive System

Drive Belt Adjustment

To properly adjust the drive belt:

- a. Turn on ac line power to disk drive.
- b. Observe drive belt rotation in relationship to spindle pulley. Determine if drive belt is tracking low or high.
- c. Turn off ac line power to disk drive.
- d. Loosen drive motor pulley setscrew from rear of unit.

- e. Adjust position of drive motor pulley:
 - 1. If belt is tracking high, raise pulley.
 - 2. If belt is tracking low, lower pulley.
- f. Tighten pulley setscrew.
- g. Turn on ac line power.
- h. Verify that drive belt is tracking properly.
- i. Repeat adjustment until tracking is correct, or until it is determined that drive belt must be replaced.

Drive Belt Replacement

To replace the drive belt:

- a. Turn off ac line power to disk drive.
- b. Remove PCB. Refer to Printed Circuit Board Replacement procedure.
- c. Remove drive belt from spindle pulley and discard.
- d. Clean both pulleys with alcohol.
- e. Install replacement drive belt and rotate spindle pulley to correctly position drive belt.
- f. Install PCB and connectors P1, P2 and P4 through P8.

Drive Motor Replacement

To replace drive motor:

- a. Disconnect all cables, remove disk drive from mounting, and place on clean work surface.
- b. Remove PCB. Refer to Printed Circuit Board Replacement procedure.
- c. Remove drive belt.
- d. Loosen setscrew and remove drive motor pulley.
- e. Identify and remove quick-disconnect wires from ac line capacitor and connector.

- f. Remove four (4) pan-head screws. Drive motor is now loosened from disk drive.
- g. Lift disk drive straight up and away from loosened drive motor.
- h. Position disk drive over new drive motor and slowly lower unit until deck assembly holes are aligned with drive motor holes.
- i. Fasten new drive motor using four (4) pan head screws.
- j. Connect ac input wires to ac line capacitor and connector.
- k. Install drive motor pulley with setscrew on flat of shaft.
- l. Install drive belt and verify correct tracking. Refer to Drive Belt Adjustment procedure.
- m. Install PCB and connectors P1, P2 and P4 through P8.

Positioning System

The positioning system consists of a stepper motor and head carriage assembly, and a track 00 photosensor.

Stepper Motor Replacement

To replace the stepper motor:

- a. Turn off all ac and dc power to disk drive.
- b. Disconnect controller cables, remove drive from mounting, and place on a clean work surface.
- c. Disconnect cable from PCB.
- d. Remove screw 'A', screw 'B' and clamp, in that order. Pull lead screw out of bearing in deck and remove entire motor/carriage assembly. Refer to Figure 1-3.
- e. Remove inner stop. Rotate lead screw to remove head carriage assembly. Remove outer stop.

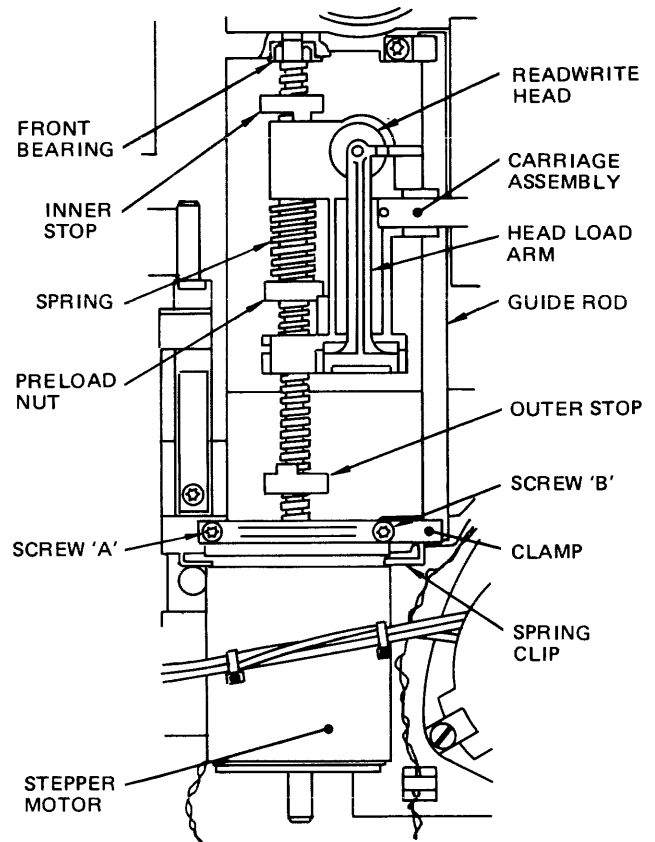


Figure 1-3. Stepper Motor Replacement

- f. Install outer stop, head carriage assembly and inner stop on replacement motor. Do not tighten stop screws.

Note

The compression spring should be compressed by positioning the preload nut such that the spacing between the nut and the carriage is 1.0 inch. See Figure 1-4.

- g. Install new stepper motor in reverse order of removal.
- h. Perform Inner Carriage Stop Adjustment procedure.
- i. Perform Stepper Motor Alignment procedure.
- j. Perform Head Carriage Stop Check and Alignment procedure.
- k. Perform Track 00 Alignment procedure.

Inner Carriage Stop Adjustment

To ensure correct adjustment of the inner carriage stop:

- a. With door open (carriage up) and carriage assembly in approximately track 00 position (toward stepper motor), insert Inner Stop Adjustment Tool as shown in Figure 1-4.
- b. Set forked portion of tool in stepper shaft between stop and carriage.
- c. Move carriage forward to make contact with other end of fork ("dog" on stop to contact notch on underside of tool).
- d. Tighten clamping screw on top to $4 \begin{smallmatrix} +0 \\ -1 \end{smallmatrix}$ in. lbs.

Stepper Motor Alignment

To align the stepper motor:

- a. Turn off all ac and dc power to disk drive.
- b. Manually rotate lead screw until head carriage contacts outer stop.
- c. Power up disk drive (power-up reset sets disk drive to Phase A).
- d. Install alignment floppy disk (contains alignment data pattern, Figure 1-5).

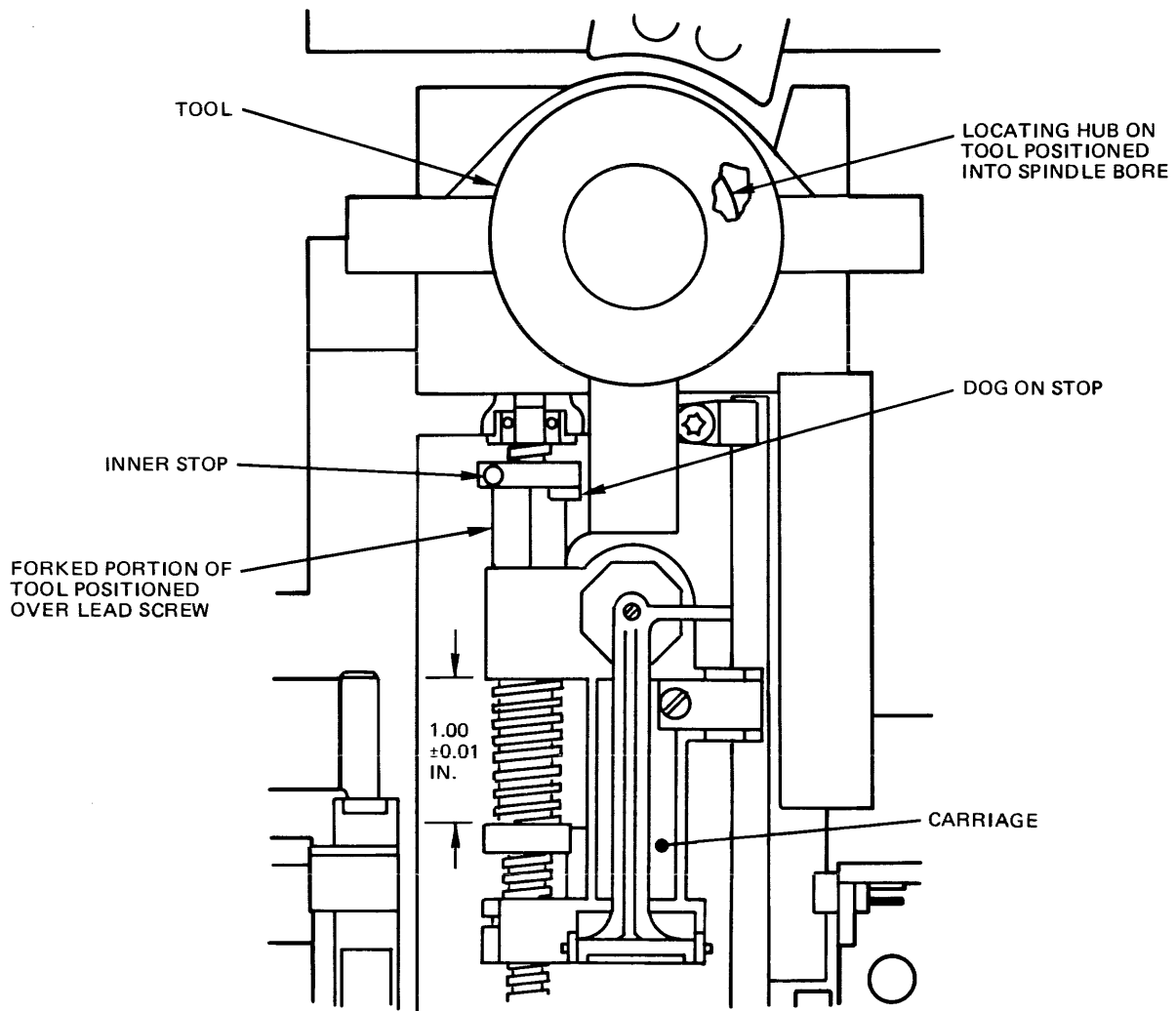


Figure 1-4. Inner Stop Adjustment Tool, Installed

- e. Set oscilloscope as follows to monitor data pattern.

SYNC: EXT POS (INDEX
 TPA8)
 HORIZ: 20 ms/cm
 VERT: 100 mv/cm
 CHAN 1: TPC2

- f. Load read/write head.
- g. Loosen screw 'A' on stepper motor clamp.

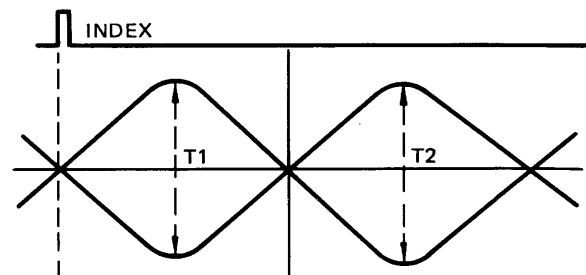


Figure 1-5. Stepper Motor Alignment Data Pattern

- h. Manually rotate stepper motor counterclockwise (CCW) until a complete pass of data is observed. Adjust for maximum amplitude.
- i. Tighten the stepper motor holding screw to maintain the setting.
- j. Drive stepper motor in to track 38 and observe that alignment envelopes are as shown in Figure 1-5; T1 and T2 should be within 90 percent amplitude of each other.
- k. If alignment envelopes are not within 90 percent of each other, manually rotate stepper motor until alignment amplitudes are equal. Tighten holding screw firmly, observing that alignment does not change.
- l. Confirm alignment by driving stepper motor off track 38 and return. Check from both directions.
- m. Perform Track 00 Alignment procedure.
- n. Perform Head Carriage Stop Check and Alignment procedures.

Track 00 Alignment

To align stepper motor to track 00:

- a. Loosen outer stop of stepper motor.
- b. Perform steps a. through f. of Stepper Motor Alignment procedure.
- c. Activate STEP IN until a complete revolution of data is displayed (Track 00)
- d. Reconnect oscilloscope as follows:
 - SYNC: AUTO, INT
 - VERT: 2 v/cm
 - CHAN 1: TPA4
- e. Observe that the signal at TPA4 is low when head carriage is at track 00 and 01, and high when head carriage is at track 02 or higher. Adjust optical switch if required.

Head Carriage Stop Check and Alignment

To align head carriage stop:

- a. Perform steps a. through c. of Track 00 Alignment procedure.
- b. While observing data pattern step out one track (track 00 minus 1).
- c. Adjust "boss" of outer stop against head carriage and tighten screw to 54 ± 2 oz. in. See Figure 1-6.
- d. Step out one more track (to track 00 minus 2). Head carriage should not move.
- e. Step out one more track (to track 00 minus 3). Head carriage should move in one track with data pattern returning to full amplitude.

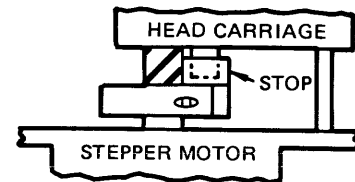


Figure 1-6. Head Carriage Outer Stop Position

Read/Write System

The read/write system comprises the read/write head and associated logic on the PCB. The read/write head is mounted on the carriage assembly and is not replaceable as a single component. If the head is found to be defective, the complete head carriage assembly must be replaced. Refer to Stepper Motor Replacement and perform all steps that apply.

The read/write head load mechanism ensures that the pressure pad (head load) arm is raised for floppy disk insertion and ejection, and lowered to apply proper disk pressure against the head.

Head Load Check and Adjustment

To check the head load operation:

- a. Step to track 00 and observe that TRACK 0 is active at PCB interface.
- b. Activate HEAD LOAD signal on interface.
- c. Verify that a gap exists between head load solenoid bail and pressure pad (load) arm (See Figure 1-7).

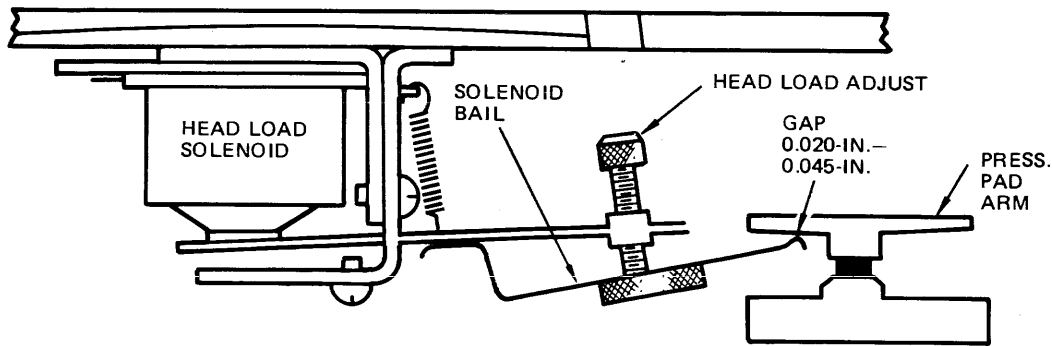


Figure 1-7. Head Load Adjust, Head Engaged

- d. If gap is not correct, adjust head load hex socket-head screw until gap is correct.
- e. With head loaded, step in to track 76, verifying that head load solenoid bail and pressure pad arm do not touch over complete distance.

Pressure Pad Check and Adjustment

Check the pressure pad for excessive wear by the following procedure:

- a. Lift pressure pad arm away from solenoid load bail and head.
- b. Check felt pad for excessive wear or dirt buildup. Use inspection mirror and flashlight.
- c. Replace, if necessary, by pushing out cartridge from pressure arm assembly. Do not allow arm without pad to contact head.
- d. Install new cartridge on pressure arm in same position.
- e. Verify read operation by inserting prerecorded floppy disk and loading head.
- f. Set oscilloscope as follows:

SYNC: EXT POS (INDEX TP2)
 HORIZ: 20 ms/cm
 VERT: 100 mv/cm
 CHAN 1: TPC2

- g. While observing recorded data amplitude, apply additional load force of approximately 30 grams to pressure arm assembly. Observed signal should not increase more than 10 percent.
- h. If greater than 10 percent, rotate cartridge until maximum amplitude is obtained.

Electronics

The electronics of the disk drive consist of the PCB, the INDEX and Track 00 pulse detectors and logic, and the write protect detector and logic. The PCB contains IC circuits and discrete components necessary to logically perform all read/write and control functions. The INDEX pulse detector and write-protect detector are separate and independent LED/photo transistor assemblies.

The detectors and the read/write logic can be easily checked to ensure proper operation.

Index Pulse Detector Check

To check the INDEX pulse detector and associated logic:

- a. Insert scratch floppy disk with index hole only (when drive is configured without Hard Sector option).
- b. Power-up disk drive.
- c. Verify that DRIVE MOTOR is ON
- d. Set oscilloscope as follows, to monitor INDEX pulse period, as shown in Figure 1-8.

SYNC: INT POS
HORIZ: 20 ms/cm
VERT: 2 v/cm
CHAN 1: INDEX (TPA8)

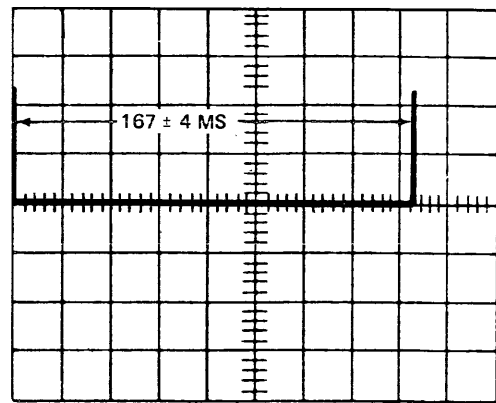


Figure 1-8. Index Pulse Period

- e. Observe INDEX pulse period of 167 ± 4 milliseconds, as shown in Figure 1-8.
- f. Set oscilloscope as follows to monitor INDEX pulse duration, as shown in Figure 1-9.

SYNC: INT POS
HORIZ: 2 ms/cm,
0.1 ms/cm
VERT: 2 v/cm
CHAN 1: INDEX (TPA8)

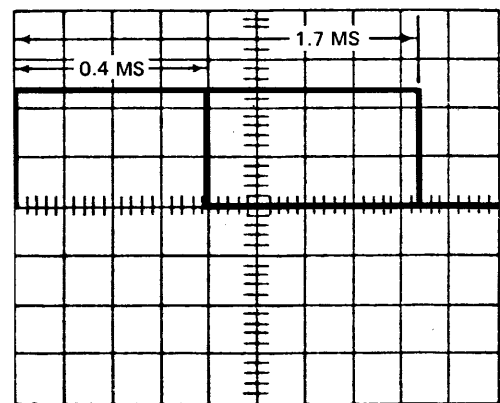


Figure 1-9. Index Pulse Duration

- g. Observe INDEX pulse duration of 1.7 milliseconds, as shown in Figure 1-9.
- h. Adjust R34 on PCB if pulse duration is not 1.7 milliseconds. Verify that IC input 3A10 is between 0.0 and 0.5 volts. If not, readjust R1.
- i. Perform Index Pulse Detector Alignment procedure if INDEX pulse does not occur as shown in Figures 1-8 and 1-9.
- j. Perform this check in same manner for a disk drive configured for Hard Sector option, except use a floppy disk with index and sector holes. Step e. should also check for a 0.4 ± 0.2 millisecond pulse width as shown in Figure 1-9 at IC location IC13 on the PCB.

Index and Read Data Synchronization

To align the INDEX pulse detector:

- a. Perform Index Pulse Detector Check.
- b. Power-up disk drive.
- c. Insert Alignment floppy disk and activate Head Load.
- d. Position read/write head to track 01.
- e. Set oscilloscope as follows, to monitor leading edge of INDEX pulse and DATA, as shown in Figure 1-10.

SYNC: INT (INDEX TP2)
 HORIZ: $50 \mu\text{s}/\text{cm}$
 VERT: $0.2 \text{ v}/\text{cm}$
 CHAN 1: INDEX (TPA8)
 CHAN 2: DATA (TPC2)

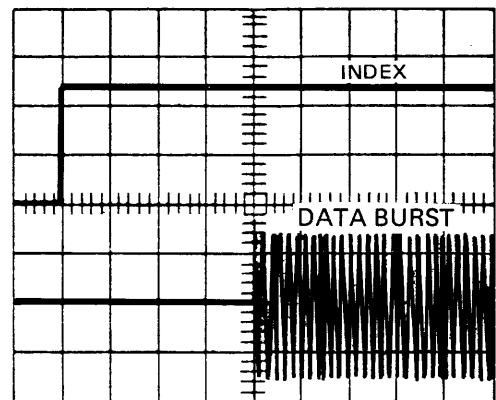


Figure 1-10. Synchronized Data

- f. Observe that the DATA burst is delayed from rising edge of INDEX by 200 ± 50 microseconds.
- g. Loosen index detector mounting screw, adjacent to spindle pulley, if timing is not within 200 ± 50 microseconds.
- h. Move index detector assembly left or right to meet proper timing. Tighten mounting screw.
- i. Position head to track 76 and repeat steps e. through h., offsetting index detector, if necessary, such that both track 00 and track 76 meet 200 ± 50 microsecond timing.

Index Pulse Detector Replacement

The index pulse detector comprises an LED and a phototransistor assembly. To replace the LED:

- a. Disconnect cables from disk drive.
- b. Remove disk drive from mounting and place on clean work surface.
- c. Remove PCB. Refer to Printed Circuit Board Replacement procedure.
- d. Manually move ejector to latched position and close access door.
- e. Remove retaining ring from post on floppy disk guide.
- f. Remove LED holder.
- g. Remove wires from wire clamps and from pins P7-4 and P7-D of connector.
- h. Install replacement LED, housing, and wires. Install contacts in P7-4 and P7-D in connector.

To replace the phototransistor assembly:

- i. Remove index detector mounting screw and washer.
- j. Remove wires from pins P7-1 and P7-A.
- k. Install replacement assembly in reverse order of removal.
- l. Perform Index Pulse Detector Check and Alignment procedures.

Write-Protect Detector Check

To check the write-protect detector and associated logic:

- a. Insert non write-protect floppy disk in disk drive (write-protect hole covered).
- b. Turn on ac and dc input power.
- c. With voltohmmeter, measure logical 0 voltage level (+2.4 to +5.5-volt) at $\overline{\text{WRT PROTECT}}$ interface connector J3 pin 44.
- d. Remove non write-protect disk and insert write-protect disk (hole open).
- e. With voltohmmeter, measure logical 1 voltage level (0.0 to +0.4 volt) at J3 pin 44; verifying write-protect circuit functions properly.

Printed Circuit Board (PCB) Replacement

The PCB contains the logic circuitry for the disk drive, is easily accessible and can be removed and replaced quite readily.

To replace the PCB:

- a. Turn off all ac and dc power to disk drive.
- b. Disconnect controller cables from connector J3 (Signal), J2 (DC), J1 (AC).
- c. Remove disk drive from mounting and place on clean work surface.
- d. Disconnect plug P4 (door interlock), P5 (head load), P6 (stepper motor), P7 (signal), and P8 (RW).
- e. Remove four (4) pan-head screws from corners of PCB. Lift PCB up and away from deck assembly.
- f. Install replacement PCB in reverse order.
- g. Install disk drive.

SECTION 2

ILLUSTRATED PARTS BREAKDOWN

GENERAL

This section provides an illustrated parts breakdown of all assemblies and parts on the Floppy Disk Drive. The entire unit is sequentially listed in one continuous indentured breakdown, with all attaching hardware.

Figures 2-1 through 2-6 illustrate all assemblies and their parts. Parts identified by item number correspond to item numbers in the parts list. Figure 2-7 illustrates the PCB assembly and all parts are identified by reference designator.

PURPOSE

The purpose of this section is to provide a complete listing of all items of the disk drive, in assembly breakdown order, to aid maintenance personnel. The illustrations and parts list are related for use in identification, requisitioning, storing, and issuing of replacement parts.

ORDERING PARTS

Parts will be supplied by the nearest Siemens office upon receipt of an order specifying the part number and description as listed in this section.

INDENTURED PARTS LIST - MODEL FDD 100-8D

The following parts list provides an indentured listing of all parts of the Model FDD 100-8D Floppy Disk Drive, in an assembly breakdown order, with attaching

parts. For all assemblies, except the PCB, the list is divided into five columns of information:

- Item
- Part Number
- Description
- Indent
- Quantity

Item Number	The number assigned to a line item part. All numbers are sequential, starting from the number 1. Major assemblies and parts are called out on illustrations, except for the PCB.
Indent	A number assigned for the assembly order of breakdown and subordinate piece parts. All indented numbers show relationship to next higher assembly. The PCB parts list does not have Indent numbers.
Description	This column is prepared to graphically indicate the indenture and fully describe the item. This description should be included when ordering. The PCB description column is not indented.
Part Number	The manufacturers part number of the item. This number must be included when ordering.
Quantity	The quantity used per assembly.
Ref Desig	The reference designator column is used in the PCB parts list only. This column lists the reference designator of all identical parts having the same part number and description. The parts are listed in alpha-numeric order. All option parts are listed by option.

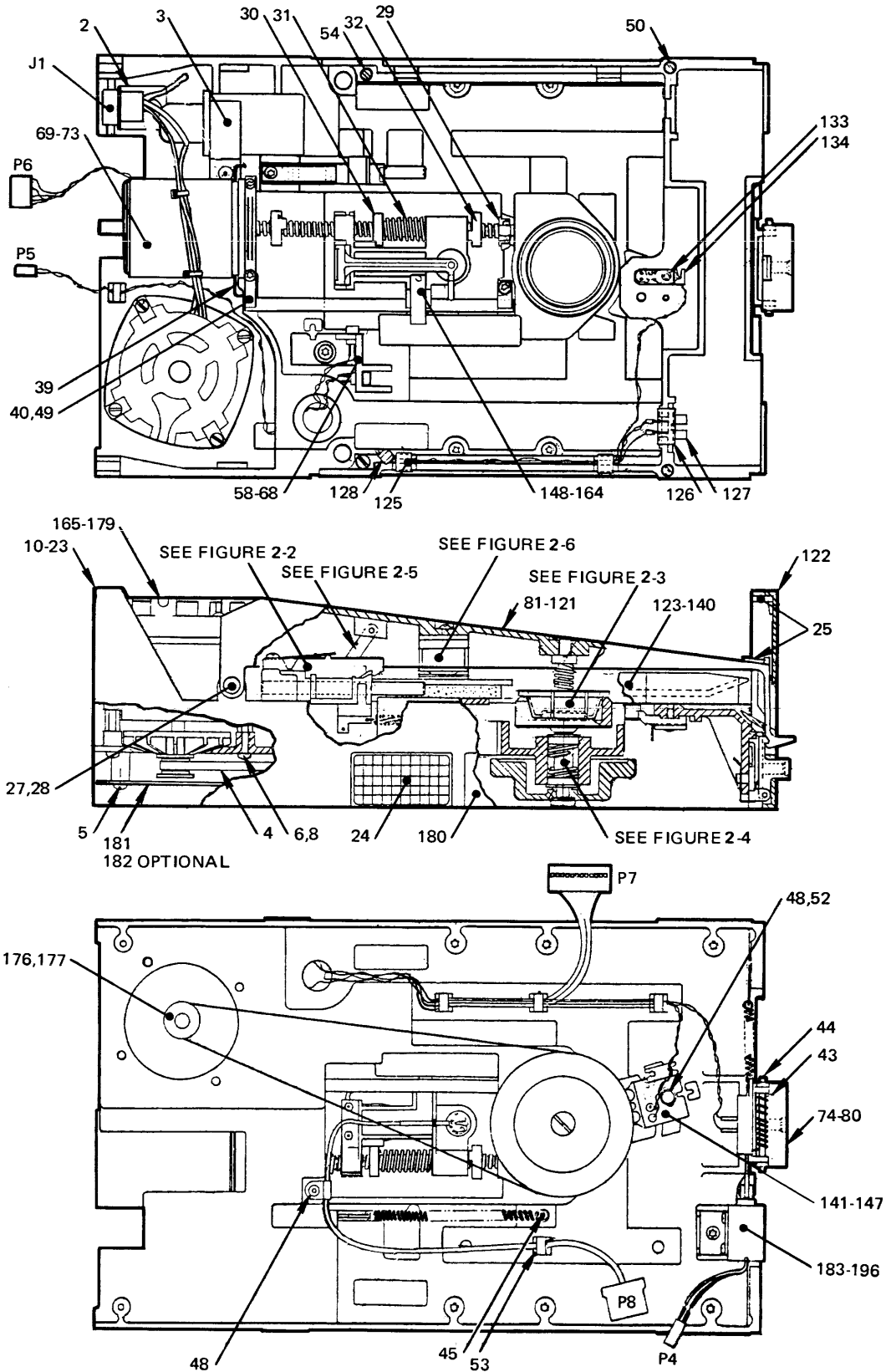


Figure 2-1. Model FDD 100-8D, Top, Side and Bottom Views, Detailed Parts

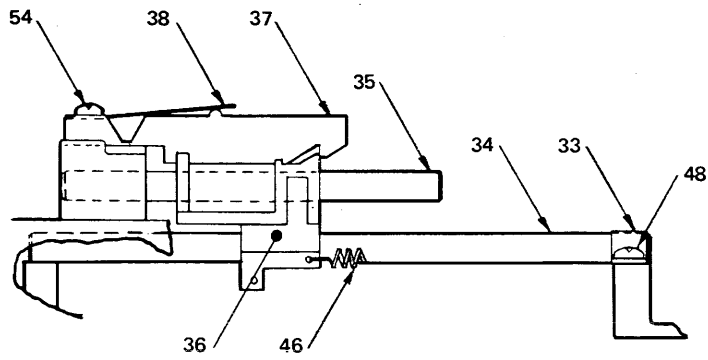


Figure 2-2. Ejector Assembly

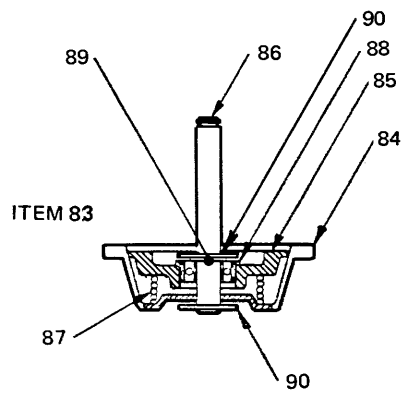


Figure 2-3. Cone Assembly

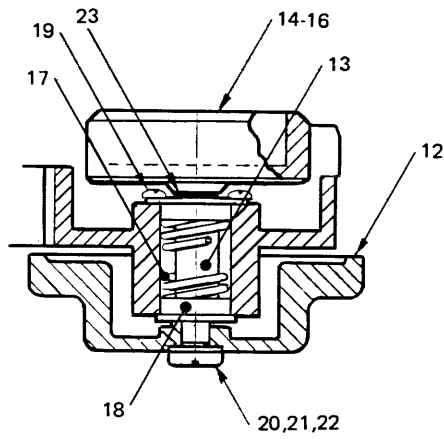


Figure 2-4. Pulley Spindle Assembly

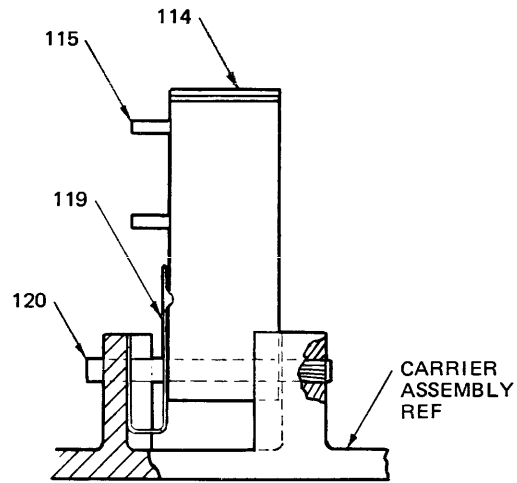


Figure 2-5. Ejector Trip Assembly

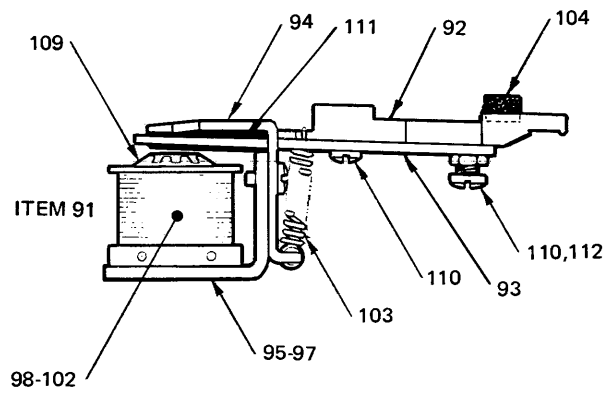


Figure 2-6. Load Solenoid Assembly

<u>ITEM</u>	<u>INDENT</u>	<u>DESCRIPTION</u>	<u>PART NO.</u>	<u>QTY</u>
	1 2 3 4 5			
1	1	FINAL ASSY	L22741-A100-D*	1
2	2	Bracket, Connector	C22256-A108-C061	1
3	2	Bracket, Capacitor	C22256-A108-C062	1
4	2	Belt, Spindle	V22748-Y103-B001	1
5	2	Screw, (6-32 x 5/16)	V22748-G122-A605	7
6	2	Screw, (8-32 x 5/8)	V22748-G122-A710	4
7	2	Washer, Internal Lock	V22748-Q300-A005	1
8	2	Loctite, Screw Lock	V22748-A100-A007	A/R
9	2	Chassis, Assy	S22741-E001-A001	1
10	3	Deck, Assy	C22256-A108-B081	1
11	4	Deck, Machined	C22256-A108-C001	1
12	4	Pulley, Spindle	C22256-A108-C014	1
13	4	Spacer Bearing	C22256-A108-C045	1
14	4	Spindle, Assy	C22256-A108-B901	1
15	5	Spindle	C22256-A108-C044	1
16	5	Shaft, Spindle	C22256-A108-C043	1
17	4	Spring, Compression	C22256-A108-C071	1
18	4	Bearing, Flanged	V22748-B225-A019	2
19	4	Screw, (6-32 x 5/16)	V22748-G122-A605	2
20	4	Screw, (8-32 x 3/8)	V22748-G122-A706	1
21	4	Washer, Flat #8	V22748-Q121-A107	1
22	4	Loctite, Screw Lock	V22748-A100-A007	A/R
23	4	Shim, Spacer (0.001 thk)	C22256-A108-C049	1
23	4	Shim, Spacer (0.003 thk)	C22256-A108-C050	1
23	4	Shim, Spacer (0.005 thk)	C22256-A108-C051	1
24	3	Label, Revision	V22748-Z001-A003	1
25	3	Bumper, Rubber	C22256-A108-C106	4
26	3	Spring, Compression	C22256-A108-C110	2
27	3	Shaft, Carrier	C22256-A108-C040	2
28	3	Ring, Retaining	V22748-T133-A010	2
29	3	Bearing, Flanged	V22748-B223-A113	1
30	3	Nut, Preload	C22256-A108-C030	1
31	3	Spring, Compression	C22256-A108-C070	1
32	3	Stop, Carriage	C22256-A108-C032	2
33	3	Clip, Guide Rod	C22256-A108-C060	1
34	3	Rod, Guide	C22256-A108-C041	1
35	3	Pin, Ejector Slide	C22256-A108-C038	1
36	3	Carriage, Ejector	C22256-A108-C020	1
37	3	Latch, Ejector	C22256-A108-C021	1
38	3	Spring, Leaf	C22256-A108-C075	1
39	3	Clip, Retainer	C22256-A108-C063	1
40	3	Clamp, Stepper Motor	C22256-A108-C019	1
41	3	Clip, Button Bracket	C22256-A108-C091	1
42	3	Bracket, Button	C22256-A108-C022	1

<u>ITEM</u>	<u>INDENT</u>	<u>DESCRIPTION</u>	<u>PART NO.</u>	<u>QTY</u>
43	3	Spring, Torsion	C22256-A108-C072	1
44	3	Pin, Pivot	C22256-A108-C039	1
45	3	Base, Clip Snap-In	V22748-Y101-A001	1
46	3	Spring, Extension	C22256-A108-C087	1
47	3	Screw, Hex Sock. HD	V22748-G422-B204	2
48	3	Screw, (6-32 x 5/16)	V22748-G122-A605	4
49	3	Screw, (6-32 x 5/8)	V22748-G322-A610	2
50	3	Screw, (6-32 x 7/8)	V22748-G322-A614	2
51	3	Screw, (10-32 x 3/8)	V22748-G121-A806	4
52	3	Washer, Flat #6	V22748-Q121-A106	2
53	3	Wire, Guide Clip	V22748-Y101-A002	5
54	3	Screw, (6-32 x 7/16)	V22748-G122-A607	3
55	3	Connector	V22747-X202-A024	1
56	3	Polarizing Plug	V22748-Y104-A001	1
57	3	Shim	C22256-A108-C103	A/R
58	3	Track 00 and W/P	C22256-A108-B171	1
59	4	Bracket, Write/Protect	C22256-A108-C024	1
60	4	Photosensor	V22747-A200-A003	1
61	4	Photosensor	V22747-A200-A004	1
62	4	Contact, Crimp	V22747-X300-A010	8
63	4	Shrink Tubing	V22747-Y105-A004	8
64	4	Wire (Brn/Wht)	V22747-W126-J119	1
65	4	Wire (Gry/Wht)	V22747-W126-J189	1
66	4	Wire (Grn/Wht)	V22747-W126-J159	1
67	4	Wire (Red/Wht)	V22747-W126-J129	1
68	4	Tie, Wrap	V22748-Y102-A001	1
69	3	Stepper Motor Assy	C22256-A108-B101	1
70	4	Stepper Motor	V22747-M100-A001	1
71	4	Connector (5 Pin)	V22747-X200-B105	1
72	4	Terminal, Crimp	V22747-X300-A010	4
73	4	Polarizing Key	V22748-Y104-A001	1
74	3	Button Assy	C22256-A108-B041	1
75	4	Contact, Crimp	V22747-X300-A010	2
76	4	Terminal, Crimp	V22747-X300-B002	2
77	4	Wire (Grn/Blk)	V22747-W126-J105	1
78	4	Loctite 404	V22747-A100-A001	A/R
79	4	Button	C22256-A108-C092	1
80	4	LED Indicator	V22747-V200-A001	1
81	3	Carrier Assy	C22256-A108-B131	1
82	4	Carrier, Painted	C22256-A108-C005	1
83	4	Cone Assy	C22256-A108-B141	1
84	5	Cone, Thrust	C22256-A108-C034	1
85	5	Follower, Cone	C22256-A108-C035	1
86	5	Shaft, Cone	C22256-A108-C047	1

ITEM	INDENT	DESCRIPTION	PART NO.	QTY	
					1
87	5	Spring, Compression	C22256-A108-C068	1	
88	5	Bearing, Flanged	V22748-B223-A118	1	
89	5	Washer, Shim	C22256-A108-C036	1	
90	5	Ring, Retaining	V22748-T104-A017	2	
91	4	Load Solenoid Assy	C22256-A108-B151	1	
92	5	Bail, Head Load	C22256-A108-B910	1	
93	5	Armature, Solenoid	C22256-A108-C066	1	
94	5	Bracket, Solenoid	C22256-A108-C065	1	
95	5	Field, Assy	C22256-A108-B904	1	
96	6	Field, Solenoid	C22256-A108-C067	1	
97	6	Post, Solenoid	C22256-A108-C048	1	
98	5	Coil, Assy	C22256-A108-B905	1	
99	6	Bobbin, Solenoid	C22256-A108-C026	1	
100	6	Wire, Magnet	V22747-W900-H901	A/R	
101	6	Tape Electric	V22748-Y110-A003	A/R	
102	6	Terminal	V22747-X103-A001	2	
103	5	Spring, Extension	C22256 A108-C108	1	
104	5	Pad, Foam	C22256-A108-C052	1	
105	5	Wire (Blk/Brn)	V22747-W126-J101	1	
106	5	Terminal, Crimp	V22747-X300-B002	2	
107	5	Contact, Crimp	V22747-X300-A010	2	
108	5	Connector (2 Pin)	V22747-X200-B102	1	
109	5	Retaining, Ring	V22748-T101-A069	1	
110	5	Screw (4-40 x 1/4)	V22746-G202-A404	4	
111	5	Residual, Insul	C22256-A108-C097	1	
112	5	Nut, Hex	V22748-N112-A004	1	
113	4	Ejector Trip Assy	C22256-A108-B907	1	
114	5	Ejector, Trip	C22256-A108-C025	1	
115	5	Roll-Pin	V22748-P211-A116	2	
116	4	Ring, Retaining	V22748-T104-A017	1	
117	4	Spring, Compression	C22256 A108-C069	1	
118	4	Washer, Nylon	C22256-A108-C037	1	
119	4	Clip, Detent	C22256-A108-C064	1	
120	4	Pin, Pivot	C22256-A108-C046	1	
121	4	Screw, (8-32 x 3/8)	V22748-G122-A706	1	
122	3	Bezel, Painted	C22256-A108-C008	1	
123	3	Diskette, Guide Assy	C22256-A108-B051	1	
124	4	Diskette Guide	C22256-A108-C003	1	
125	4	Clamp, Wire	C22256-A108-C115	2	
126	4	Clip, Door Closed	C22256-A108-C058	1	
127	4	Sensor, Door Closed	V22747-V200-A003	1	
128	4	Tie, Wrap	V22748-Y102-A001	1	
129	4	Terminal, Crimp	V22748-X300-A010	4	
130	4	Wire (Vio/Wht)	V22747-W126-J179	1	

ITEM	INDENT	DESCRIPTION						PART NO.	QTY
		1	2	3	4	5	6		
131	4							V22747-W126-J109	1
132	4							V22748-Y105-A004	4
133	4							V22748-T101-A003	1
134	4							C22256-A108-B181	1
135	5							C22256-A108-B903	1
136	6							C22256-A108-C033	1
137	6							V22747-X102-B003	2
138	5							V22747-V200-A002	1
139	5							V22747-W126-J169	1
140	5							V22747-X300-A010	2
141	3							C22256-A108-B191	1
142	4							C22256-A108-B912	1
143	5							C22256-A108-C023	1
144	5							V22747-X102-B002	2
145	4							V22747-V200-A005	1
146	4							V22747-X300-A010	2
147	4							V22747-W126-J139	1
148	3							C22256-A108-B111	1
149	4							C22256-A108-B909	1
150	4							C22256-A108-C027	1
151	4							C22256-A108-C042	1
152	4							C22256-A108-B906	1
153	5							C22256-A108-C028	1
154	5							C22256-A108-C054	1
155	4							C22256-A108-C104	1
156	4							C22256-A108-B916	1
157	4							V22748-A100-A001	A/R
158	4							V22748-A200-A003	A/R
159	4							V22747-X101-A001	1
160	4							V22747-X300-C010	4
161	4							V22747-E001-A001	1
162	4							V22747-W100-F001	A/R
163	4							C22256-A108-C076	1
164	4							V22748-G202-A402	1
165	2							S22741-D001-A001	1
165	2							S22741-D001-A002	1
165	2							S22741-D001-A004	1
166	3							V22747-M200-A001	1
167	3							V22747-C992-A001	1
168	3							V22748-Y109-A001	1
169	3							V22747-W118-J111	1
170	3							V22747-W118-J154	1
171	3							V22748-Y102-A001	1
172	3							V22748-A100-A007	A/R

<u>ITEM</u>	<u>INDENT</u>	<u>DESCRIPTION</u>	<u>PART NO.</u>	<u>QTY</u>
		1 2 3 4 5 6		
173	3	Screw, Set. Soc. Hd.	V22748-G842-B604	1
174	3	Terminal, Ring	V22747-X106-A005	1
175	3	Terminal, Quick Connect	V22747-X105-A001	3
176	3	Pulley/Impeller 50 Hz	C22256-A108-C018	1
177	3	Pulley/Impeller 60 Hz	C22256-A108-C016	1
178	3	Connector, Siemens	V22747-X101-B002	1
179	3	Terminal, Crimp	V22747-X400-A001	3
180	2	Label, Configuration	C22256-A108-C085	1
181	2	P. C. Board	S22741-L001-A001	1
182	2	P. C. Board (Optional)	S22741-L001-A004	1
183	2	Door Lock Assy (Optional)	C22256-A108-B201	1
184	3	Solenoid	V22747-K300-A001	1
185	3	Roll Pin (0.094 Dia)	V22748-P211-A306	1
186	3	Slide, Door Lock	C22256-A108-C057	1
187	3	Spring, Extension	C22256-A108-C074	1
188	3	Bracket, Spring Mt.	C22256-A108-C084	1
189	3	Bracket, Solenoid	C22256-A108-C056	1
190	3	Connector (2 Pin)	V22747-X200-B102	1
191	3	Contact, Crimp	V22747-X300-A010	1
192	3	Screw, (4-40 x 1/8)	V22748-G202-A402	2
193	3	Screw, (6-32 x 5/16)	V22748-G122-A605	1
194	3	Clamp, Cable	V22748-Y100-A012	2
195	3	Wire (Blu/Blk)	V22747-W126-J106	1
196	3	Tubing, Shrink (1/16 ID)	V22748-Y105-A002	2

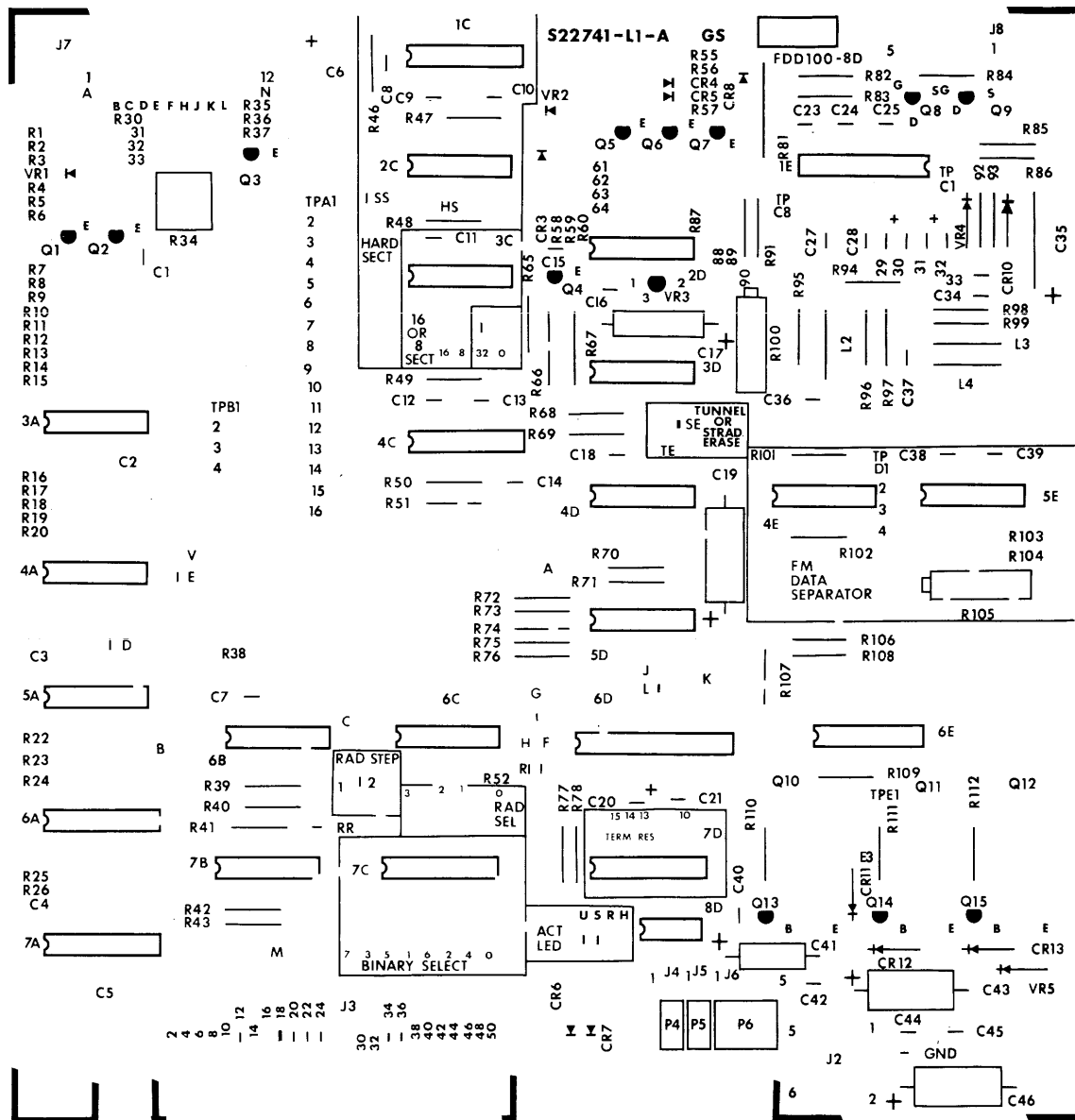


Figure 2-7. Read/Write and Control Logic, PCB Assy

<u>Ref Designator</u>	<u>Part Number</u>	<u>Description</u>	<u>Qty</u>
C1,24	V22747-C352-A271	Capacitor, Cer. , 270 pf $\pm 10\%$ 200V	2
C2,3,4,7,12, 15,18,21,25, 27,32,33,40, 42,44,45	V22747-C133-A473	Capacitor, Cer. , 0.047 μ f, $\pm 20\%$ 50V	16
C6,20,29,31	V22747-C513-A335	Capacitor, Tant. , 3.3 μ f $\pm 20\%$ 10V	4
C13,14,28,30	V22747-C332-B104	Capacitor, Cer. , 0.1 μ f $\pm 10\%$ 50V	4
C16	V22747-C523-A334	Capacitor, Tant, 0.33 μ f $\pm 20\%$ 35V	1
C17,19,43,46	V22747-C423-C226	Capacitor, Tant. , 22 μ f $\pm 20\%$ 35V	4
C23	V22747-C352-A121	Capacitor, Cer. , 120 pf $\pm 10\%$ 200V	1
C34	V22747-C352-A561	Capacitor, Cer. , 560 pf $\pm 10\%$ 200V	1
C35,41	V22747-C423-C685	Capacitor, Tant. , 6.8 μ f $\pm 20\%$ 35V	2
C36	V22747-C342-A182	Capacitor, Cer. , 1800 pf $\pm 10\%$ 100V	1
C37	V22747-C352-A820	Capacitor, Cer. , 82 pf $\pm 10\%$ 200V	1
CR3,4,5,8,10	V22747-V300-A001	Diode, 1N444	5
CR6,7,11,12, 13	V22747-V400-A001	Diode, 1N4001	5
L2	V22747-K400-A029	Choke, 22 μ h	1
L3,4	V22747-K400-A036	Choke, 82 μ h	2
Q1,2,3,13, 14,15	V22747-V800-A004	Transistor, 2N3904	6
Q4,5,6,7	V22747-V800-A003	Transistor, 2N3906	4
Q8,9	V22747-V800-A005	Transistor, 2N5460	2
Q10,11,12	V22747-V800-A002	Transistor, TIP31A	3
R1,6,87	V22747-R113-A222	Resistor, $\pm 5\%$, 1/4w, 2.2K	3
R2,8,37,55, 56	V22747-R113-A473	Resistor, $\pm 5\%$, 1/4w, 47K	5
R3	V22747-R101-D187	Resistor, $\pm 1\%$, 1/8w, 18.7K	1
R4,31	V22747-R113-A101	Resistor, $\pm 5\%$, 1/4w, 100 Ω	2
R5,22,41,68, 110-112	V22747-R113-A221	Resistor, $\pm 5\%$, 1/4w, 220 Ω	7
R7,36,58,70	V22747-R113-A103	Resistor, $\pm 5\%$, 1/4w, 10K	4
R9,10,14,16, 17	V22747-R101-D226	Resistor, $\pm 1\%$, 1/8w, 22.6K	5

<u>Ref Designator</u>	<u>Part Number</u>	<u>Description</u>	<u>Qty</u>
R11, 18	V22747-R113-A104	Resistor, ±5%, 1/4w, 100K	2
R12, 19, 20, 65, 90, 91	V22747-R113-A512	Resistor, ±5%, 1/4w, 5.1K	6
R13	V22747-R113-A203	Resistor, ±5%, 1/4w, 20K	1
R15	V22747-R101-C442	Resistor, ±1%, 1/8w, 4.42K	1
R23, 42, 69	V22747-R113-A331	Resistor, ±5%, 1/4w, 330Ω	3
R24, 40, 41 76, 77	V22747-R113-A302	Resistor, ±5%, 1/4w, 3K	5
R25, 26, 38, 39, 52, 72, 75, 78, 106-109	V22747-R113-A102	Resistor, ±5%, 1/4w, 1K	14
R30, 33	V22747-R113-A131	Resistor, ±5%, 1/4w, 130Ω	2
R32	V22747-R113-A750	Resistor, ±5%, 1/4w, 75Ω	1
R34	V22747-R524-A503	Resistor, Variable, 50K	1
R35, 89	V22747-R113-A271	Resistor, ±5%, 1/4w, 270Ω	2
R49	V22747-R101-C287	Resistor, ±1%, 1/8w, 2.87K	1
R50	V22747-R101-C750	Resistor, ±1%, 1/8w, 7.50K	1
R59	V22747-R101-C169	Resistor, ±1%, 1/8w, 1.69K	1
R60	V22747-R101-D105	Resistor, ±1%, 1/8w, 10.5K	1
R61, 63, 96, 97	V22747-R101-B274	Resistor, ±1%, 1/8w, 274Ω	4
R62, 64	V22747-R101-C140	Resistor, ±1%, 1/8w, 1.40K	2
R66, 67	V22747-R223-A101	Resistor, ±5%, 1/2w, 100Ω	2
R71	V22747-R113-A153	Resistor, ±5%, 1/4w, 15K	1
R81	V22747-R243-A560	Resistor, ±1%, 1w, 56	1
R82	V22747-R101-C249	Resistor, ±1%, 1/8w, 2.49K	1
R83	V22747-R101-C511	Resistor, ±1%, 1/8w, 5.11K	1
R84	V22747-R101-C487	Resistor, ±1%, 1/8w, 4.87K	1
R85, 86	V22747-R101-D100	Resistor, ±1%, 1/8w, 10.0K	2
R88	V22747-R113-A391	Resistor, ±5%, 1/4w, 390	1
R92, 93	V22747-R113-A122	Resistor, ±5%, 1/4w, 1.2K	2
R94	V22747-R101-B365	Resistor, ±1%, 1/8w, 365	1
R95	V22747-R101-A825	Resistor, ±1%, 1/8w, 82.5	1
R98, 99	V22747-R101-B402	Resistor, ±1%, 1/8w, 402	2

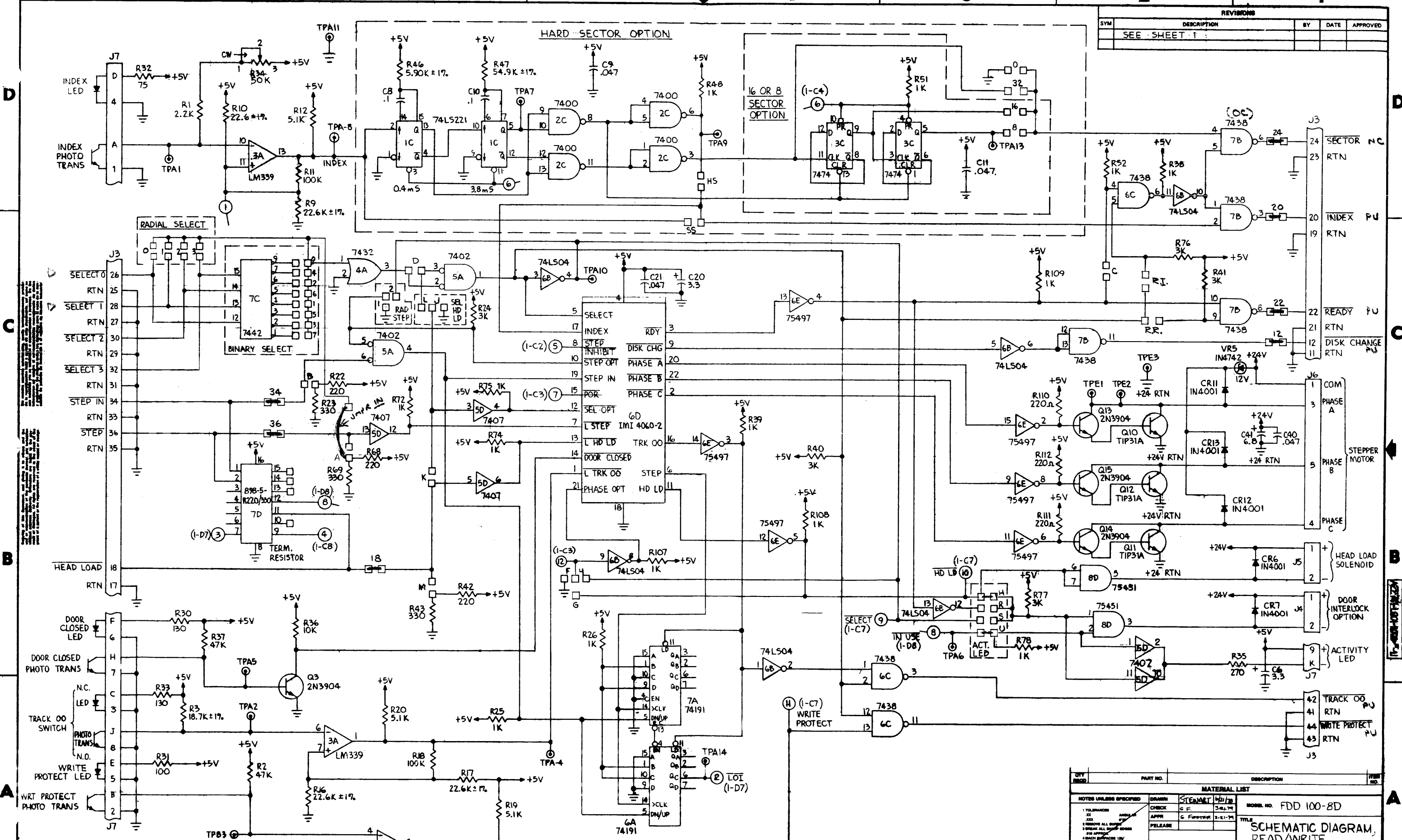
<u>Ref Designator</u>	<u>Part Number</u>	<u>Description</u>	<u>Qty</u>
R100	V22747-R534-A011	Resistor, Variable, 20K	1
VR1	V22747-V100-A001	Zener Diode, 1N746A	1
VR2	V22747-V100-A007	Zener Diode, 1N752A	1
VR3	V22747-E001-A002	Voltage Regulator 78L05ACP	1
VR4	V22747-V100-A014	Zener Diode, 1N759A	1
VR5	V22747-V100-A015	Zener Diode, 1N4742	1
1E	V22747-D800-A002	IC, Read Amplifier, MC3470	1
2D, 5D	V22747-D500-A006	IC, Hex Buffer/Driver 7407	2
3A	V22747-D200-A001	IC, Comparitor, LM339	1
3D	V22747-D500-A004	IC, D-Type, Flip/Flop 7474	1
4A	V22747-D500-A005	IC, OR Gate 7432	1
4C	V22747-D500-A011	IC, Monostable Multivibrator, 74LS221	1
4D, 5A	V22747-D500-A010	IC, NOR Gate 7402	2
6A, 7A	V22747-D500-A009	IC, Up/Down Binary Counter 74191	2
6B	V22747-D500-A016	IC, Inverter 74LS04	1
6C, 7B	V22747-D500-A007	IC, NAND Buffer 7438	2
6D	V22747-D800-A001	IC, LSI Logic Circuit	1
6E	V22747-D300-A002	IC, MOS Interface Circuit	1
7C	V22747-D500-A008	IC, Decoder 7442	1
7D	V22747-R953-A001	IC, Resistor Pack	1
8D	V22747-D300-A003	IC, Peripheral Driver 75451	1

FM Data Separator Option

C38	V22747-C133-A473	Capacitor, Cer., 0.047 μ f \pm 20%, 50V	1
C39	V22747-C352-A221	Capacitor, Cer., 220 pf \pm 10%, 200V	1
R101, 102, 103	V22747-R113-A102	Resistor, \pm 5%, 1/4w, 1K	3
R104	V22747-R101-D100	Resistor, \pm 1%, 1/8w, 10.0K	1
R105	V22747-R534-A011	Resistor, Variable, 20K	1
4E	V22747-D500-A007	IC, NAND Buffer 7438	1
5E	V22747-D500-A002	IC, Monostable Multivibrator 74121	1

<u>Ref Designator</u>	<u>Part Number</u>	<u>Description</u>	<u>Qty</u>
<u>Hard Sector Option</u>			
C8,10	V22747-C332-B104	Capacitor, Cer., 0.1 μ f \pm 10%, 50V	2
C9,11	V22747-C133-A473	Capacitor, Cer., 0.047 μ f \pm 20%, 50V	2
R46	V22747-R101-C590	Resistor, \pm 1%, 1/8w, 5.90K	1
R47	V22747-R101-D549	Resistor, \pm 1%, 1/8w, 54.9K	1
R48,51	V22747-R113-A102	Resistor, \pm 5%, 1/4w, 1K	2
1C	V22747-D500-A011	IC, Monostable Multivibrator 74LS221	1
2C	V22747-D500-A001	IC, NAND Gate 7400	1
3C	V22747-D500-A004	IC, D-Type Flip/Flop	1

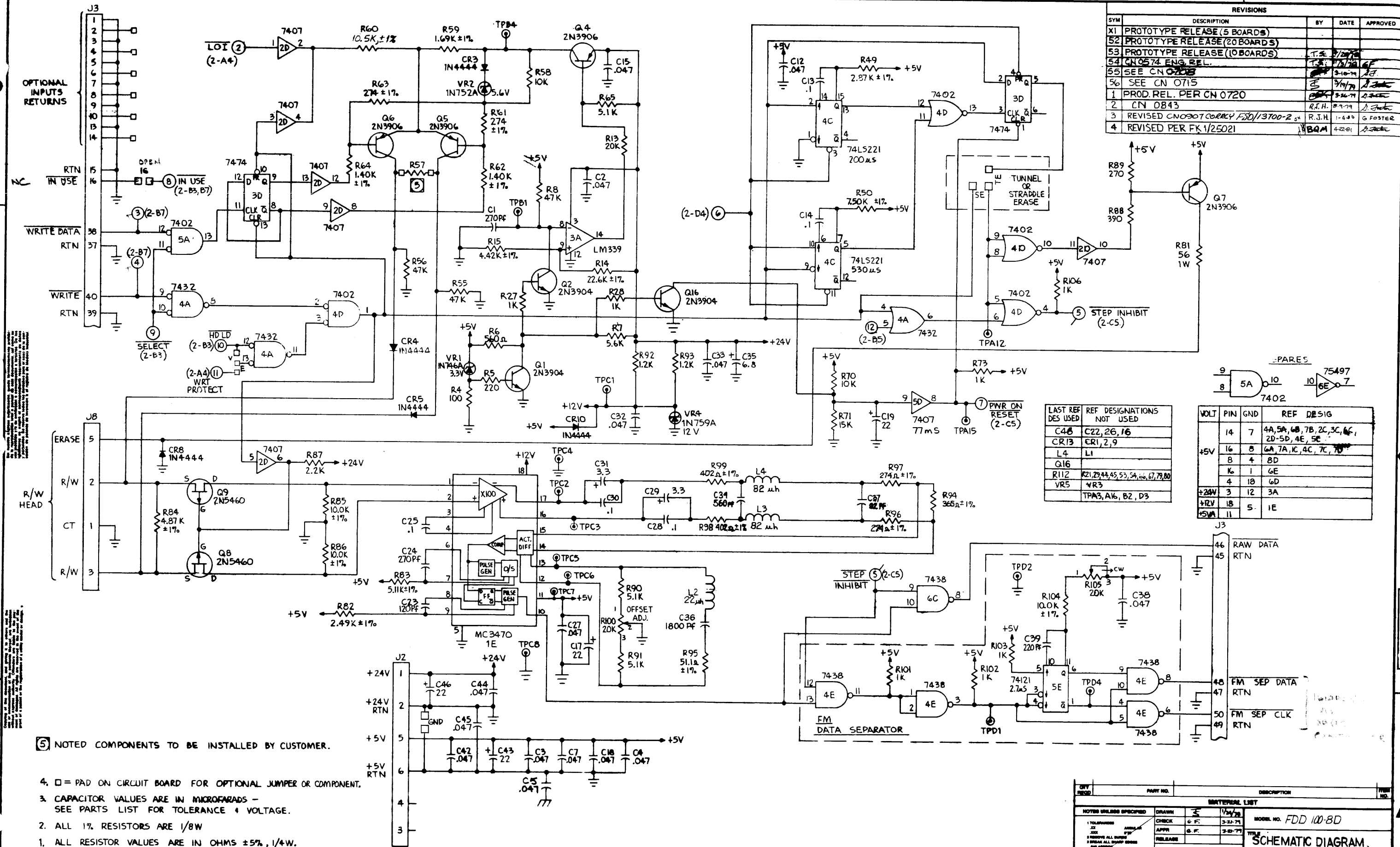
REVISIONS				
SYM	DESCRIPTION	BY	DATE	APPROVED
SEE SHEET 1				



NOTES: UNLESS OTHERWISE SPECIFIED
SEE SHEET 1

QTY	PART NO.	DESCRIPTION	REV. NO.
MATERIAL LIST			
NOTES UNLESS SPECIFIED		DRAWN: STEWART	DATE: 3-21-74
1. TOLERANCES UNLESS OTHERWISE SPECIFIED		CHECK: G.F.	DATE: 3-21-74
2. DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED		APPR: G. FORTNER	DATE: 3-21-74
3. ALL DIMENSIONS ARE TO CENTER UNLESS OTHERWISE SPECIFIED		RELEASE: G. FORTNER	DATE: 3-21-74
4. ALL DIMENSIONS ARE TO CENTER UNLESS OTHERWISE SPECIFIED		Siemens AG	
5. ALL DIMENSIONS ARE TO CENTER UNLESS OTHERWISE SPECIFIED		MODEL NO. FDD 100-8D	
6. ALL DIMENSIONS ARE TO CENTER UNLESS OTHERWISE SPECIFIED		TITLE: SCHEMATIC DIAGRAM, READ/WRITE AND CONTROL LOGIC	
7. ALL DIMENSIONS ARE TO CENTER UNLESS OTHERWISE SPECIFIED		MATERIAL: D A22741-L001-X000-#-11	
8. ALL DIMENSIONS ARE TO CENTER UNLESS OTHERWISE SPECIFIED		DATE: 3-21-74	
9. ALL DIMENSIONS ARE TO CENTER UNLESS OTHERWISE SPECIFIED		SCALE: DO NOT SCALE THIS DRAWING	
10. ALL DIMENSIONS ARE TO CENTER UNLESS OTHERWISE SPECIFIED		SHEET 2 OF 2	

REVISIONS				
SYM	DESCRIPTION	BY	DATE	APPROVED
X1	PROTOTYPE RELEASE (5 BOARDS)			
X2	PROTOTYPE RELEASE (20 BOARDS)			
X3	PROTOTYPE RELEASE (10 BOARDS)			
X4	CN 0574 ENG. REL.	T.S.	7/20/70	
X5	SEE CN 0708		3-10-71	
X6	SEE CN 0715		3/11/71	
1	PROD. REL. PER CN 0720			
2	CN 0843	R.J.H.	8-9-71	
3	REVISED CN 0907 CORRECT FSD/13700-2	R.J.H.	1-4-72	G. FOSTER
4	REVISED PER FK 1/25021	BQM	4-22-81	



LAST REF DES USED	REF DESIGNATIONS NOT USED
C46	C22, 26, 16
CR13	CR1, 2, 9
L4	L1
Q16	
R112	R21, 29, 44, 45, 53, 54, 55, 67, 79, 80
VR5	VR3
	TPA3, A16, B2, D3

-PARES-				
VOLT	PIN	GND	REF	DESIG
+5V	14	7	4A, 5A, 6B, 7B, 2C, 3C, 4C, 5C	
	16	8	6A, 7A, 1C, 4C, 7C, 7D	
	8	4	8D	
	4	1	6E	
+24V	4	18	6D	
	3	12	3A	
+12V	18	5	1E	
+5VA	11			

5 NOTED COMPONENTS TO BE INSTALLED BY CUSTOMER.

- 4. □ = PAD ON CIRCUIT BOARD FOR OPTIONAL JUMPER OR COMPONENT.
- 3. CAPACITOR VALUES ARE IN MICROFARADS - SEE PARTS LIST FOR TOLERANCE & VOLTAGE.
- 2. ALL 1% RESISTORS ARE 1/8W
- 1. ALL RESISTOR VALUES ARE IN OHMS ± 5%, 1/4W.

NOTES: UNLESS OTHERWISE SPECIFIED

QTY	PART NO.	DESCRIPTION	UNIT
MATERIAL LIST			
NOTES UNLESS SPECIFIED			
1. TOLERANCES	2. DIMENSIONS	3. FINISHES	4. MATERIALS
5. CHECK	6. APPROV	7. RELEASE	8. DATE
DRAWN: [Signature]		DATE: 1/24/72	
CHECKED: [Signature]		DATE: 3-21-71	
APPROV: [Signature]		DATE: 3-20-71	
RELEASE: [Signature]		DATE: 3-20-71	
MODEL NO. FDD 100-8D			
TITLE: SCHEMATIC DIAGRAM, READ/WRITE AND CONTROL LOGIC			
MATERIAL: [Blank]			
DATE: 1/24/72			
PART NO. D A22741-L001-X000-X11 4			

Issued by
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