RCSL No: 44-RT1991

Edition: May 1981

Author: -

Title:

THE TWO-SIDED FLOPPY DISK DRIVE YD-174
Maintenance Manual

RCSL 42-11592

A/S REGNECENTRALEN
af 1979

Keywords: RC700, RC702, RC762, Floppy Disk Drive, FDD711, FDD712.

Abstract: This manual is produced by Y-E DATA INC. JAPAN and it may be distributed according to an agreement between Y-E DATA and RC Computer.
RC Computer uses the technical numbers FDD711 and FDD712 for the floppy disk drive.

Printed by A/S Regnecentralen af 1979, Copenhagen

RCSL 42-11592

Y-E DATA

THE TWO-SIDED FLOPPY DISK DRIVE

YD-174

MAINTENANCE MANUAL

REVISION

REV.	DESCRIPTION	DATE	DRIVE S/N APPLIED
A	PRELIMINARY	10.31.77	
B	J2 AND J3 CONNECTOR PIN ASSIGNMENT CHANGES AND EDITORIAL CHANGES ALL PAGES	4.3.'78	-06-XXX
C	LOW CURRENT PIN ASSIGNMENT CHANGE FROM J1-24 TO J1-2 PAGE 29,34	5.6.'78	-07-XXX
D	TAP-TAP RELIABILITY IMPROVEMENT	11.27.78	-10-xxx
E	PAGE 33	12.14.'78	-10-xxx

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Y-E DATA

THE TWO-SIDED FLOPPY DISK DRIVE
YD-174
PRODUCT SPECIFICATION

DWG No.	REV.
FDB-527007	E

SHEET 1 OF 53

TABLE OF CONTENTS

1.0 GENERAL

This manual contains the instructions required to maintain the YD-174. The information is provided in the form of preventive maintenance, corrective maintenance and recommended spare part list.

2.0 MAINTENANCE TOOLS

The special tools required to maintain the YD-174 are listed below:

tool	Y-E DATA Part Number
1. Tool Kit	140263-01
Screw driver	140264-01
Tweezer	140265-01
Setscrew wrench, 1.5	140266-01
Setscrew wrench, 2.0	140266-02
Feeler guage, 0.500 mm	140267-01
Feeler guage, 0.530 mm	140267-02
Inspection mirror	140268-01
Cutter	140269-01
Needle-nose pliers	140364-01
2. CE disk	140272-01

3.0 MAINTENANCE LEVEL

The maintenance is devided into two categories; preventive maintenance and corrective maintenance.
The corrective maintenance on this manual is devided into two levels; level 1 and level 2.
The maintenance level 1 includes removal/replacement of printed wired board (PWB) and five photo sensor assemblies and also contains drive belt and steel belt wiper.
The maintenance level 2 includes removal/replacement of all mechanical assemblies including that of level 1.

4.0 PREVENTIVE MAINTENANCE

4.1 GENERAL

Under nomal circumstances preventive maintenance is not required on the YD-174. If severely dirty environments are encountered, an occasional cleaning of the drive may be performed to assure continued reliable performance.

4.2 VISUAL CHECK

Visual inspection is the first step in any maintenance operation.
Always look for corrosion, dirt, wear, binds, and loose connections.
Noticing these items may save downtime later.

4.3 CLEANING

Cleanliness cannot be overemphasized in maintenance of the YD-174.

CAUTION; The head/carriage assembly is a factory-adjusted and tested assembly. Do not try to adjust or repair this internal component. Do not, for any reason, clean the read/writeheads. To do so would cause severe damage to the head surfaces or head spring supports.

Parts	Observe	Procedure
1. Main Frame	Inspect for loose screws, connectors, switches, etc.	Clean main frame
2. Drive Belt	Frayed or weakend area	Change new belt

5.0 MAINTENANCE LEVEL 1

This section contains the detail maintenance procedure on the assemblies listed below.

5.1 PWB
5.2 INDEX LAMP ASSEMBLY
5.3 INDEX SENSOR ASSEMBLY
5.4 TRACK 00 SENSOR ASSEMBLY
5.5 WRITE PROTECT SENSOR ASSEMBLY
5.6 IN USE LED
5.7 WIPER
5.8 DRIVE BELT AND DRIVE PULLEY

5.1 PWB REMOVAL AND REPLACEMENT

CAUTION: Check the drive serial number on the main frame, to replace the PWB. (See Fig.1,page 25).

1. For the drive serial number from S/N 001-xxx to S/N 009-xxx with label [3] near AC connector, or from S/N 010-xxx , use only PWB PN 110018-02. Do not use PWB PN 110018-01.

2. For the drive serial number from S/N 001-xxx to S/N 009-xxx without label [3] near AC connector, use only PWB PN 110018-01.

NOTE; To modify the PWB PN 110018-02 into PN 110018-01, follow the procedure below.

1. Cut the three (3) components (49C, 50c, and 39D) on the PWB.
2. Change PWB PN from 110018-02 to 110018-01.

1. Disconnect four connectors (J1, J2, J3, J5) from PWB.
2. Remove two mounting screws near J1 connector and losen two screws.
3. Slide PWB away from stepper and remove it.
4. Reverse the procedure for replacement.

5.2 INDEX LAMP ASSEMBLY

5.2.1 SERVICE CHECK

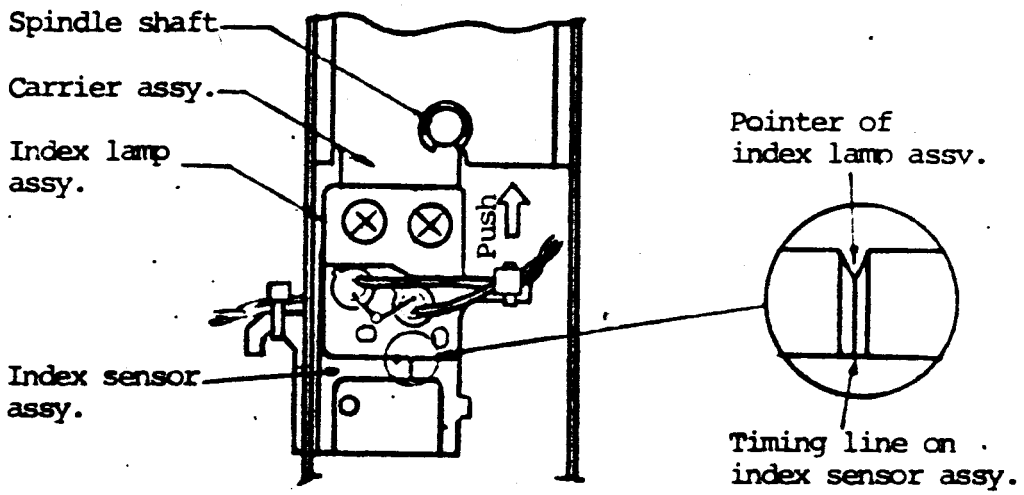
1. Turn on power.
2. Verify voltage of 2.0 to 3.4 V between "J2-16" and " GND " test points on PWB.

5.2.2 REMOVAL AND REPLACEMENT

1. Disconnect J2 connector from PWB.
2. Remove two lamp leads from J2 connector by pushing down on tabs with a tweezer, (BLACK to J2-A8, RED to J2-B8)
3. Remove cable clamp and lamp cable.
4. Remove two mounting screws and lamp assembly.
5. Reverse the procedure for replacement.

NOTE; When installing the assembly, align the pointer of lamp assembly with the timing line of index sensor assembly and tighten two mounting screws by pushing lamp assembly against carrier stop away from the front door.

CAUTION; Make sure the locking tabs on the terminals engage in the connector slot to prevent the leads from pushing out when plugged in.



5.3 INDEX SENSOR ASSEMBLY

5.3.1 SERVICE CHECK

1. Turn on power.

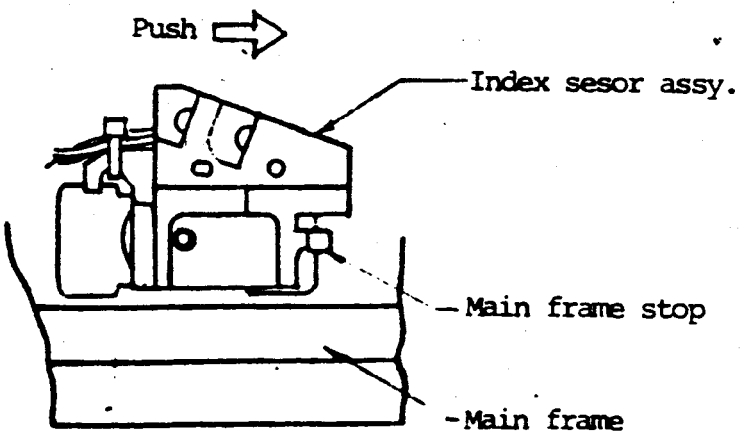
2. Verify the voltage of 4 to 5.25 V when door closed without a Diskette, 0 to 0.3 V when a Diskette inserted backward and door closed, between "J2-A7" and " GND " test points on PWB.
3. Repeat the same ptocedure between "J2-A6" and " GND " test points on PWB.
4. Remove the Diskette.

5.3.2 REMOVAL AND REPLACEMENT

1. Disconnect J2 connector from PWB.
2. Remove four SENSOR leads from J2 connector by pushing down on tabs with a tweezer.(BLACK to J2-A7 RED to J2-B7, BLUE to J2-A6, ORANGE to J2-B6)
3. Remove, screw, washer and assembly.
4. Reverse the procedure for replacement.

NOTE; When installing assembly, push it against the main frame stop away from its cable.

CAUTION; Make sure that the locking tabs on the terminals engage in the connector slot to prevent the leads from pushing out when plugged in.



5.4 TRACK 00 SENSOR ASSEMBLY

5.4.1 SERVICE CHECK

1. Position the head/carriage by hand to its limit away from spindle (the outer of TRACK 00).
2. Turn on power.

NOTE; This positions head/carriage to TRACK 00.

3. Verify voltage of 1.0 to 1.7 V between "J2-B12" and " GND " test points on PWB without a Diskette.
4. Verify voltage of 0 to 0.3 V between "J2-A11" and " GND " test points on PWB.
5. With power off, move the head/carriage by hand toward spindle, 4 stepper detent positions. (TRACK 04)
6. With power on, verify voltage of 4.0 to 5.25 V between the same test points in step 4

5.4.2 REMOVAL AND REPLACEMENT

1. Disconnect J2 connector from PWB.
2. Remove four leads from J2 connector by pushing down on tabs with a tweezer. (BLUE to J2-A12 ORANGE to J2-B12 BLACK to J2-A11 RED to J2-B11)
3. Remove a mounting screw and assembly.

NOTE; When installing assembly, inspect its two pins into main frame holes and tighten a screw.

CAUTION; Make sure that the locking tabs on the terminals engage in the connector slot to prevent the leads from pushing out when plugged in.

5.5 WRITE PROTECT SENSOR ASSEMBLY

5.5.1 SERVICE CHECK

1. Turn on power.
2. Verify voltage of 1.0 to 1.7 V between J2-B14 and " GND " test points on PWB without a Diskette.
3. Verify voltage of 4 to 5.25 V when door closed and 0 to 0.3 V when a Diskette without a write protect notch is inserted, and the door closed, between "J2-A13" and " GND " test points on PWB.
4. Remove the Diskette.

5.5.2 REMOVAL AND REPLACEMENT

1. Disconnect J2 connector from PWB.
2. Remove four leads from J2 connector by pushing down on tabs with a tweezer. (BLUE to J2-A14 ORANGE to J2-B14 BLACK to J2-A13 RED to J2-B13)
3. With door open, remove the bail mounting screw, washer and bail. (6.4)
4. Remove a screw and assembly.
5. Reverse the procedure for replacement.

NOTE; When installing assembly, insert its pin into the main frame hole and tighten a screw.

CAUTION; Make sure that the locking tabs on the terminals engage in the connector slot to prevent the leads from pushing out when plugged in.

5.6 IN USE LED REMOVAL AND REPLACEMENT

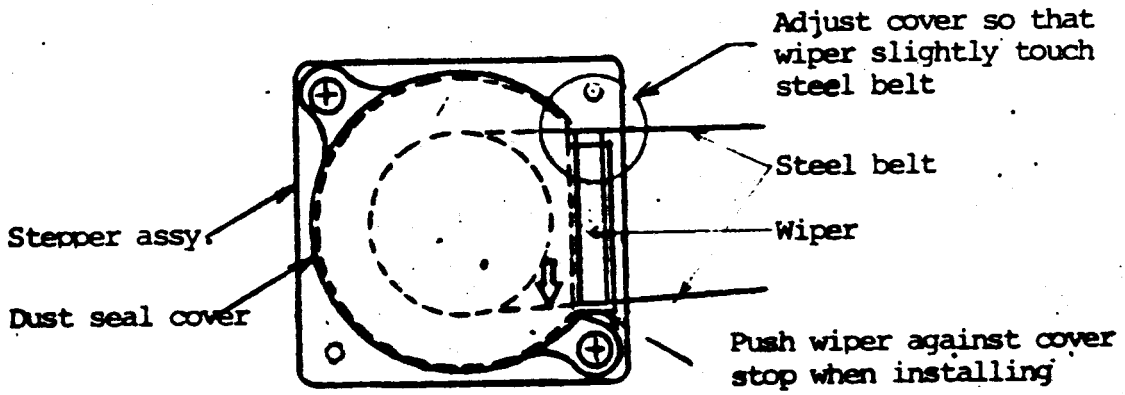
1. Disconnect J2 connector from PWB.
2. Remove two leads from J2 connector by pushing down on tabs with a tweezer. (BLACK to J2-A15 RED to J2-B15)
3. Remove LED holder and LED.
4. Reverse the procedure for replacement.

5.7 STEEL BELT WIPER REMOVAL AND REPLACEMENT

1. With door open, remove two screws and pop-up assembly.
2. Remove 2 screws and dustseal cover.
3. Remove wiper from dustseal cover.
4. Reverse the procedure for replacement.

NOTE; When installing a new wiper into dustseal cover, push it against the cover stop toward the arrow direction on cover.

CAUTION; When installing dustseal cover on stepper, align the dustseal cover so that wiper may slightly touch steel belt between head/carriage and pulley.



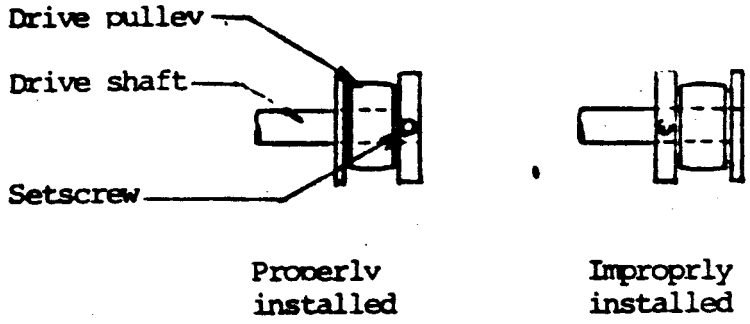
5.8 DRIVE BELT AND PULLEY, REMOVAL AND REPLACEMENT

1. Remove PWB. (5.1)
2. Remove belt.
3. Loosen a setscrew and remove pulley from motor shaft.

4. Reverse the procedure for replacement. Align the setscrew with the flat surface of motor shaft.

NOTE; Check that the surface of pulley is aligned with the end of motor shaft.

NOTE; Check that the belt is riding on center of spindle pulley and drive pulley, rotating spindle pulley counterclockwise by hand.



6.0 MAINTENANCE LEVEL 2

This section contains the detail maintenance procedure on the listed below.

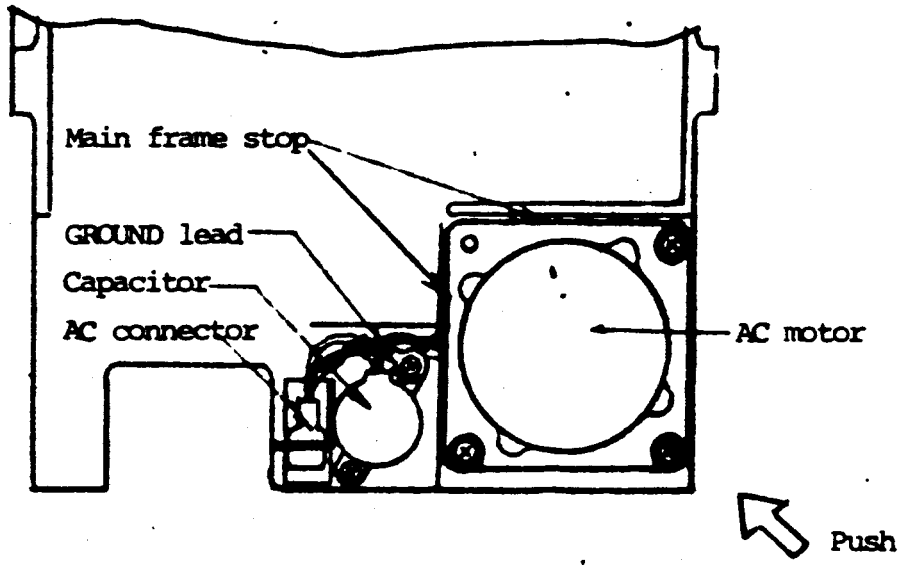
6.1 DRIVE MOTOR ASSEMBLY
6.2 CARRIER ASSEMBLY
6.3 POP-UP ASSEMBLY
6.4 BAIL ASSEMBLY
6.5 HEAD LOAD ASSEMBLY
6.6 FRONT BESEL ASSEMBLY
6.7 DOOR LOCK SOLENOID ASSEMBLY
6.8 HEAD/CARRIAGE ASSEMBLY
6.9 STEEL BELT
6.10 STEPPER ASSEMBLY
6.11 IDLER ASSEMBLY
6.12 SPINDLE BEARINGS

6.1 DRIVE MOTOR ASSEMBLY REPLACEMENT AND REPLACEMENT

1. Remove PWB (5.1) and belt.
2. Loosen a pulley setscrew and remove it from motor shaft.
3. Remove AC connector from connector clamp by pushing down on the latch.
4. Remove two screws holding capacitor clamp to main frame.
5. Remove three screws and drive motor assembly.
6. Reverse the procedure for installation.

NOTE; When installing motor, push it two main frame stops, toward front door and AC connector clamp.

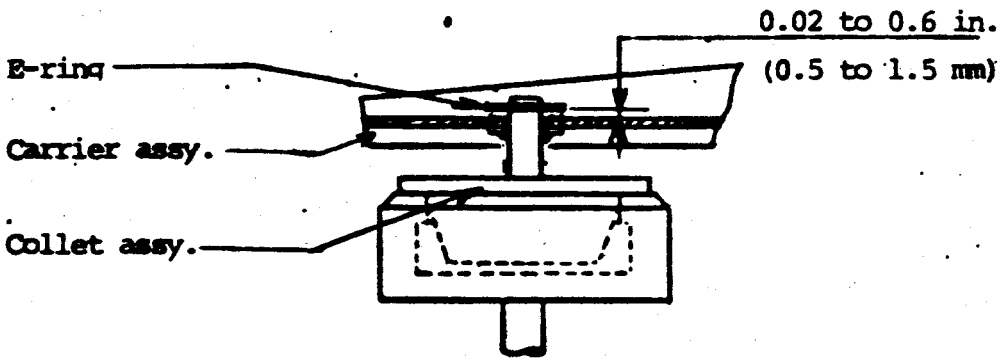
NOTE; Make sure ground lead is installed on capacitor clamp.



6.2 CARRIER ASSEMBLY

6.2.1 SERVICE CHECK

1. Close the door.
2. Verify gap of 0.02 to 0.06 in. (0.5 to 1.5 mm) between carrier and E-ring of collet assembly shaft.



6.2.2 CARRIER ACCESS

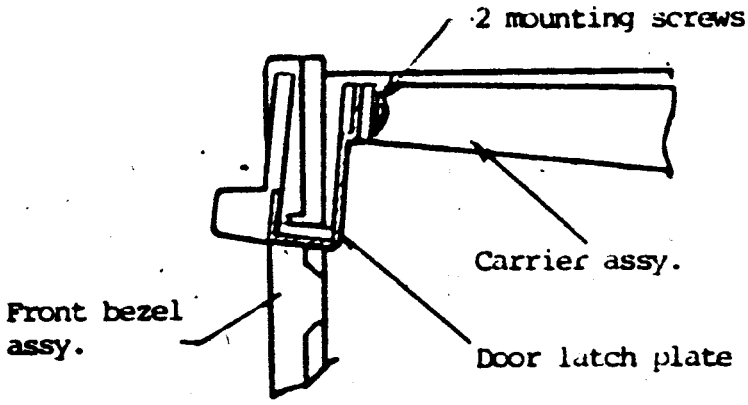
1. Remove two screws holding carrier to door latch plate.
2. Swing carrier up carefully.

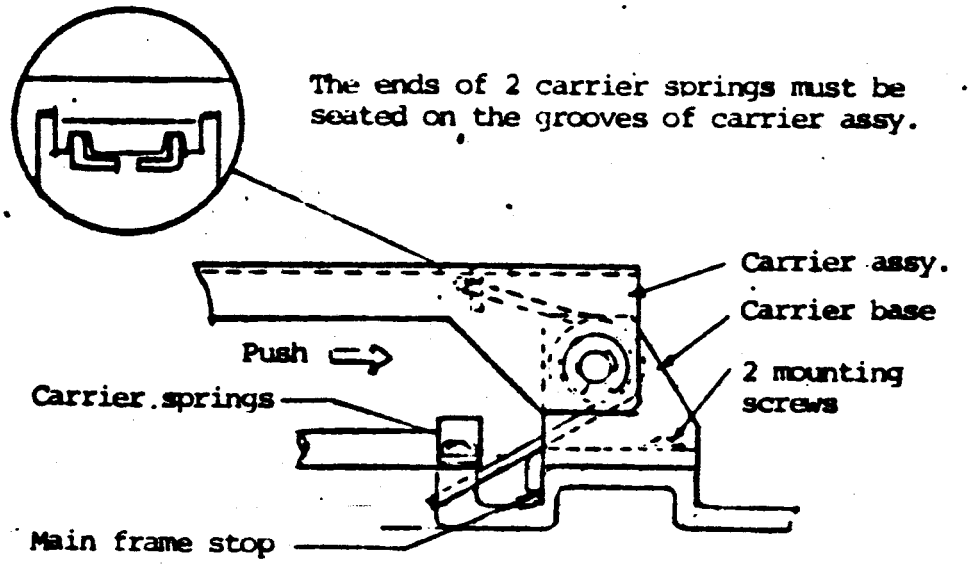
CAUTION; Carrier is spring loaded, take care when opening carrier.

3. Reverse the procedure to close carrier. Align the upper side of carrier with top edge of door latch plate at step 1.

NOTE; Ensure that two carrier springs are properly seated in the carrier grooves.

4. Do carrier service check. (6.2.1)





6.2.3 REMOVAL AND REPLACEMENT

1. Remove two screws and index lamp assembly. (5.2.2)
2. Remove cable clamp from carrier.
3. Remove two screws holding carrier to door latch plate.
4. Remove two screws holding carrier base to main frame.
5. Remove carrier.
6. Reverse the procedure for replacement.

NOTE; When installing assembly, push it against the main frame stop away from the front door and tighten two screws.

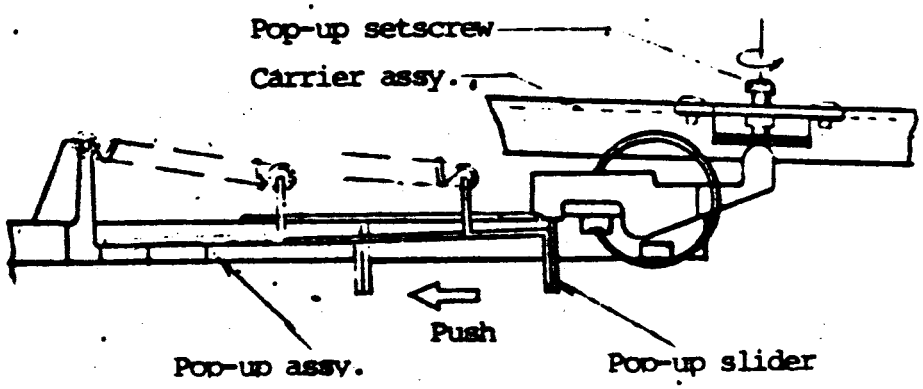
CAUTION; Check that the both ends of two carrier springs are properly seated in grooves.

7. Replace the index lamp assembly. (5.2.2)
8. Adjust the backstop screw. (6.5.2)
9. Adjust the pop-up setscrew. (6.3.2)

6.3 POP-UP ASSEMBLY

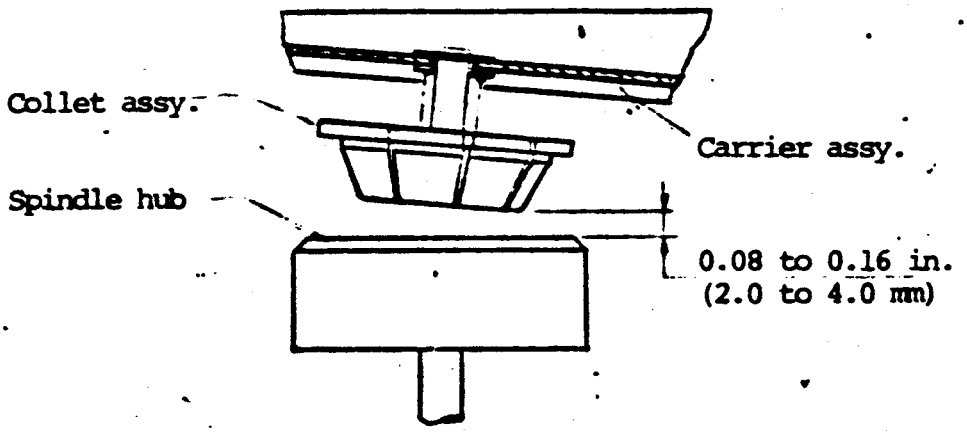
6.3.1 SERVICE CHECK

1. Insert a Diskette and close the door.
2. Push the button on front bezel, holding front door by hand.
3. Open the door slowly and hold it when a Diskette just ejected.
4. Verify gap of 0.08 to 0.16 in. (2 mm to 4 mm) between the surface of spindle hub and the end of collet assembly.



6.3.2 ADJUSTMENT

1. Rotate the pop-up setscrew on carrier assembly clockwise fulley.
2. With door close, latch the pop-up slider away from the front door.
3. Open the door slowly and hold the door looking for approximately 0.12 in.(3mm)gap between the surface of spindle hub and the end of collet assembly.
4. Rotate the screw clockwise spindle until pop-up slider is just unlatched.
5. Do service check. (6.3.1)



6.3.3 REMOVAL AND REPLACEMENT

1. Remove two screws holding assembly to frame.
2. To install, reverse the procedure.
3. Do service check. (6.3.1)

6.4 BAIL ASSEMBLY REMOVAL AND REPLACEMENT

CAUTION; The read/write heads must not be allowed to come together without a piece of clean paper inserted between the head surfaces.

1. Insert a piece of clean paper between the head surfaces.
2. Remove a mounting screw and washer.
3. Remove bail assembly, pulling away from solenoid.
4. Reverse the procedure for replacement.

NOTE; Check that the plunger must be moved when pushing its side.

CAUTION; When installing bail assy, make sure that it is under the carriage arm tab.

6.5 HEAD LOAD SOLENOID ASSEMBLY

CAUTION; The read/write heads must not be allowed to come together without a diskette or piece of clean paper inserted between the head surfaces.

CAUTION; Without removal of pop-up assembly, the head/carriage assembly would cause serve damage by diskette which may be ejected at the head load condition.

6.5.1 SERVICE CHECK

1. Remove pop-up assembly.
2. Insert a diskette and close the door.
3. With power on, energize the head load solenoid by installing a jumper between "HA" test points on PWB.
4. Verify gap of 0.02 to 0.04 in. (0.5 to 1.0 mm) between bail and carriage arm tab throughout carriage travel.
5. Remove jumper installed in step 3 and power off.
6. Remove a diskette and close the door.
7. Check the drive serial number on the frame.

NOTE; For the drive serial number from S/N 001-xxx to S/N 009-xxx without label 3 near AC connector, go to step 8
For the drive serial number from S/N 001-xxx to S/N 009-xxx with label 3 near AC connector or from S/N 010-xxx, go to step 10.

8. Look for gap of 0.06 to 0.1 in.(1.5 to 2.5 mm) between head surfaces.

NOTE; This gap cannot be measured and must be estimated using inspection mirror.

9. Go to step 14.
10. Move the head/carriage to approximately track 40.
11. Put the drive at horizontal position.(PWB at bottom side).
12. With power on, jumper the test points "HA" and then disconnect them by using extension wires.
13. Look for gap of 0.004 to 0.01 in.(0.1 to 0.25mm) between head surfaces.

NOTE; This gap cannot be measured and must be estimated using inspection mirror.

14. Replace the pop-up assembly.

6.5.2 ADJUSTMENT

1. Remove pop-up assembly.
2. Insert a diskette and close the door.

3. With power on, energize the head load solenoid by installing a jumper "HA" test points on PWB.
4. Loosen two solenoid setscrews slightly holding solenoid to its clamp.
5. Rotate a solenoid adjusting screw on solenoid clamp, for gap of 0.02 to 0.04 in.(0.5 to 1.0 mm) between bail and carriage arm tab.

NOTE; A clockwise rotation of screw decreases the gap.

6. Verify this gap throughout carriage travel.
7. Tighten two setscrews in step 4.
8. Remove jumper in step 3 and power off
9. Remove the diskette and close the door.
10. Check the drive serial number on the frame.

NOTE; For the drive serial number from S/N 001-xxx to S/N 009-xxx without [3] near AC connector, go to step 11. For the drive serial number from S/N 001-xxx to S/N 009-xxx with label [3] near AC connector or S/N 010-xxx, go to step 13.

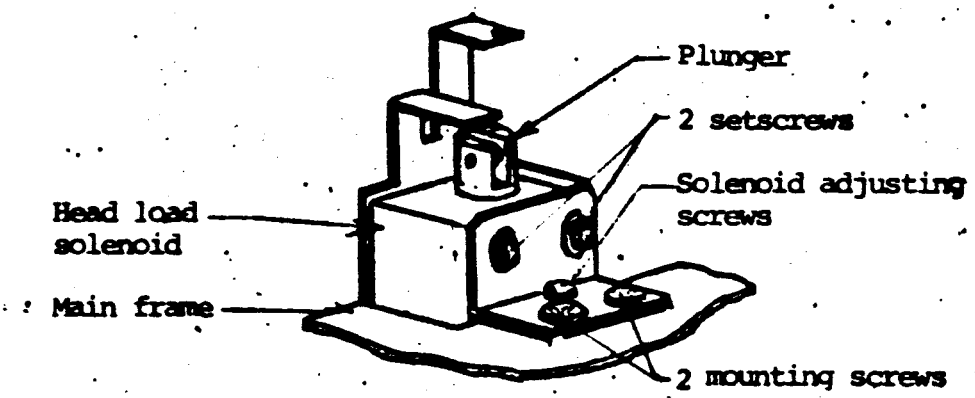
11. Look for gap of 0.06 to 0.1. (1.5 to 2.5mm) between head surfaces.

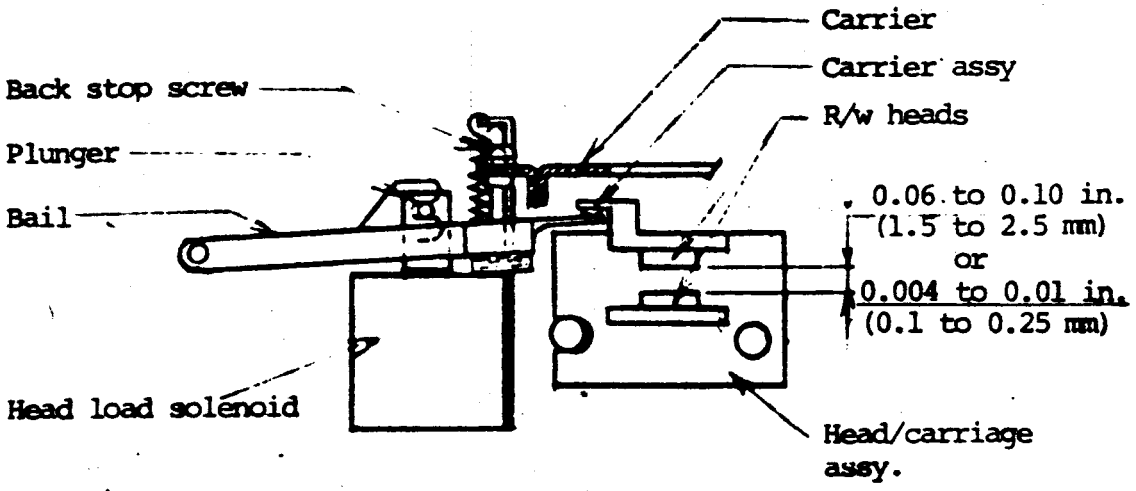
NOTE; This gap cannot be measured and must be estimated, using inspection mirror. To obtain this gap, turn back stop setscrew clockwise, until the heads just touch, then back open the heads by turning the screw one turn counterclockwise.

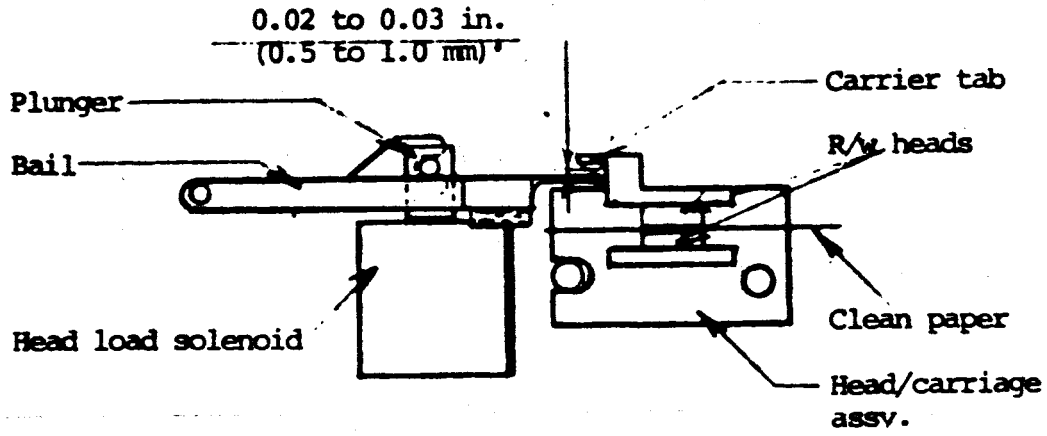
12. Go to step 15.
13. Move the head/carriage to approximately track 40.
14. Put the drive at horizontal position. (PWB at bottom side)
15. With power on, jumper the test points "HA" and then disconnect them by using extension wires.
16. Look for gap of 0.004 to 0.01 in.(0.1 to 0.25 mm) between head surfaces.

NOTE; This gap can not be measured and must be estimated using inspection mirror. A clockwise rotation of backstop setscrew decreases the gap.

17. Do service check. (6.5.1)


Plunger
2 setscrews
Solenoid adjusting screws
Head load solenoid
Main frame
2 mounting screws

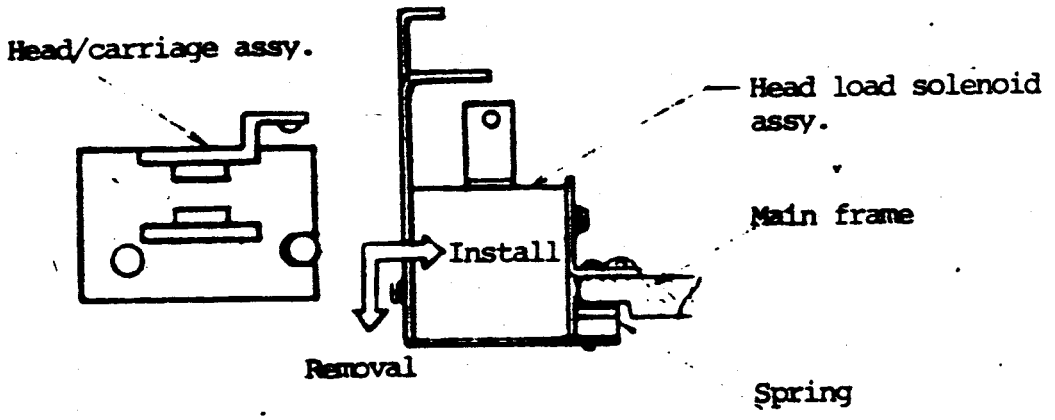

Carrier
Carrier assy
R/w heads
Back stop screw
Plunger
Bail
0.06 to 0.10 in.
(1.5 to 2.5 mm)
or
0.004 to 0.01 in.
(0.1 to 0.25 mm)
Head load solenoid
Head/carriage assy.


0.02 to 0.03 in.
(0.5 to 1.0 mm)
Carrier tab
Plunger
R/w heads
Bail
Clean paper
Head load solenoid
Head/carriage assy.

6.5.3 REMOVAL AND REPLACEMENT

1. Remove PWB. (5.1) and belt.
2. Remove 2 leads from J2 connector by pushing down on tabs with a tweezer. (BLACK to J2-A1, RED to J2-B1)
3. Swing up carrier.
4. Insert a pierce of clean paper between the head surfaces.
5. Remove bail assembly.
6. Remove bail return spring.
7. Remove two mounting screws holding clamp to frame and solenoid, moving it toward head/carriage and then downward.
8. Reverse the procedure for replacement.

CAUTION; Ensure that the bail is under tab of head/carriage arm.



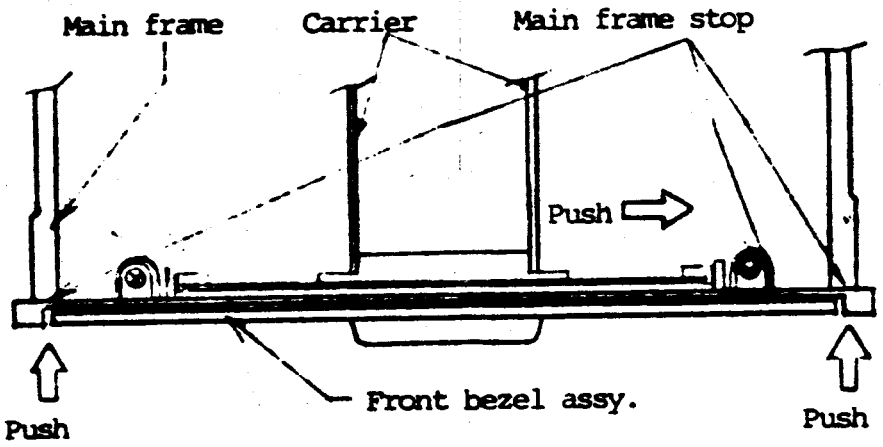
9. Do adjustment.(6.5.2)

6.6 FRONT DOOR ASSEMBLY REMOVAL AND REPLACEMENT

1. Remove J2 connector from PWB.
2. Remove two leads of door lock solenoid from connector by pushing down on tabs with a tweezer. (BLACK to J2-A2, RED to J2-B2)
3. Repeat same procedure to remove two leads of IN USE LED. (BLACK to J2-A15 RED to J2-B15)
4. Remove two screws holding carrier to door latch plate.
5. Remove two mounting screws and bezel assembly.
6. Reverse the procedure for replacement.

NOTE; When installing assembly, push it against two main frame stops, toward the spindle and pop-up assembly.

7. Do carrier service check. (6.2.1)



6.7 DOOR LOCK SOLENOID REMOVAL AND REPLACEMENT

1. Disconnect J2 connector.
2. Remove two leads from connector by pushing down on tabs with a tweezer. (BLACK to J2-A2, RED to J2-B2)
3. Remove two mounting screws and washers on front bezel.
4. Remove hook pin from hook and solenoid assembly.
5. Reverse the procedure for replacement.

6.8 HEAD/CARRIAGE ASSEMBLY

CAUTION; The head/carriage assembly is a factory-adjusted and tested assembly. Do not try adjust or repair this internal component. Do not, for any reason, clean the read/write heads. To do so would cause severe damage to the head surfaces or head spring supports.

CAUTION; The read/write head must not be allowed to come together without a piece of paper inserted between the head surfaces.

6.8.1 POSITION SERVICE CHECK

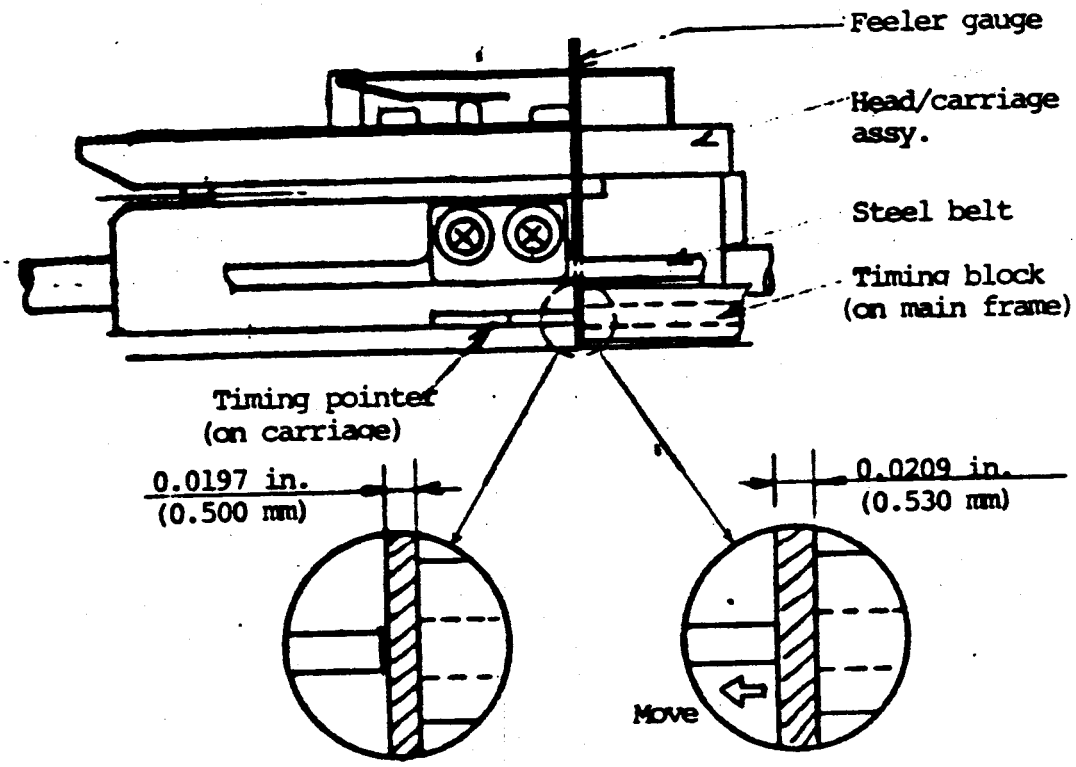
1. Remove pop-up assembly.
2. Insert a piece of clean paper between the head surfaces.
3. Position the head/carriage by hand for approximately 0.01 in.(0.25 mm) gap between timing pointer on carriage and timing block on frame.
4. With power on, electrically detent stepper to phase 0 by installing jumper "T40" test points on PWB.

NOTE; This moves the head/carriage assembly approximately 0.01 in.(0.25 mm) toward spindle and position it at track 40.

5. Verify that stepper pulley timing hole is aligned with the timing slot on stepper bracket.
6. Verify gap of 0.0197 to 0.0209 in. (0.500 to 0.530 mm) between timing pointer on carriage and timing block on frame by look for no motion of head carriage assembly when 0.0197 in. (0.500 mm) feeler gauge is inserted. Check for motion of head/carriage assembly when inserting a 0.0209 in.(0.530mm) feeler gauge.
7. If for some reason, verification in steps 5 to 6 is not positive, repeat steps 3 through 6.

NOTE; If still not positive, adjust assembly. (6.8.2)

8. Remove jumper installed in step 4.
9. Remove paper from between head surfaces.
10. Replace pop-up assembly.



6.8.2 ADJUSTMENT

1. Remove pop-up assembly.
2. Insert a piece of clean paper between the head surfaces.
3. Position head/carriage by hand to track 40.
4. Loosen two steel belt/carriage clamping screws on head/carriage assembly.
5. Align stepper pulley timing hole with timing slot on sttepper bracket.
6. With power on, install jumper between "T40" test points on PWB.
7. Verify that stepper pulley timing hole is aligned with the timing slot on stepper bracket.

NOTE; If this does not, replace stepper assembly.

8. Insert 0.0198 in.(0.500 mm) feeler gauge between timing pointer on carriage and timing block on frame.
9. With light pressure applied to top of carriage, tighten clamping screws.
11. Do position service check starting in step 6. (6.8.1)

6.8.3 REMOVAL AND REPLACEMENT

CAUTION; Before installing head/carriage assembly, insert a piece of clean paper between head surfaces.

CAUTION; When installing carriage assembly, make sure that bail assembly is under tab of the carriage arm with bail return spring properly installing.

1. Remove PWB.
2. Remove carriage cable clamp to flame.
3. Insert a piece of clean paper between head surfaces.
4. Swing the carrier.
5. Position carriage to approximately track 40.
6. Remove two steel belt/ carriage clamping screws and clamp.
7. Remove two guide bar clamping screws and clamp.
8. Carefully remove carriage assembly from drive.
9. Remove two guide bars from carriage.
10. Check the drive serial number on the frame.

NOTE; For the drive serial number from S/N 001-xxx to S/N 009-xxx without label [3] near AC connector, go to step 11
For the drive serial number from S/N 001-xxx to S/N 009-xxx with label [3] near AC connector or from S/N 010-xxx, go to step 15.

11. Check the carriage parts number just removed at at step 8

NOTE; For carriage PN 120028-01, use the same carriage parts number and go to step 12, or use carriage P/N 120028-02 and go to step 13.
For carriage PN 120028-02, use the same carriage parts number (P/N 120028-02) only. Do not use carriage 120028-01 and go to step 16.

12. Reverse the procedure for instllation and go to step 17
13. Reverse the procedure for replacement.
14. Remove the bail return spring
15. Install the bail return spring P/N 140222-02 and go to step
16. Reverse the procedure for instllation.
17. Do adjustment. (6.8.2)

6.9 STEEL BELT

6.9.1 REMOVAL

1. Remove pop-up assembly.
2. Position carriage to approximately track 40.
3. Remove two steel belt clamping screws and clamp on carriage.
4. Remove two mounting screws and dustseal cover.
5. Push idler slider against spring tension and remove steel belt from idler pulley.
6. Remove a steel belt clamping screw and clamp on stepper pulley.
7. Remove belt ends from stepper pulley pin and steel belt.

6.9.2 REPLACEMENT

1. Install belt ends on stepper pulley pin and replace clamp and screw, but do not tighten.
2. Replace belt around the idler pulley by pushing idler slider against spring tension.
3. Rotate stepper pulley and check that steel belt is centered in idler pulley throught travel several times.
4. Tighten stepper pulley clamping screw.
5. Replace dust seal cover. (5.7)
6. Replace two steel belt clamping screws and clamp on carriage.
7. Adjust carriage position. (6.8.2)

6.10 STEPPER ASSEMBLY REMOVAL AND REPLACEMENT

1. Disconnect J2 connector from PWB.
2. Remove five leads from connector and cable clamp (BLUE to J2-A5, RED to J2-A4, YELLOW to J2-B4, GREEN to J2-A3, WHITE to J2-B3)
3. Remove steel belt. (6.8)
4. Remove two mounting screws and stepper.
5. Reverse the procedure for installation.
6. Adjust head/carriage position. (6.8.1)

6.11 IDLER ASSEMBLY REMOVAL AND REPLACEMENT

1. Push idler slider against spring tension and remove the steel belt from idler.
2. Remove two mounting screws and idler.
3. Reverse the procedure for installation.

NOTE; When installing idler, push idler base toward stepper and tighten two mounting screws.

4. Check that steel belt is centered on idler pulley troughout travel.

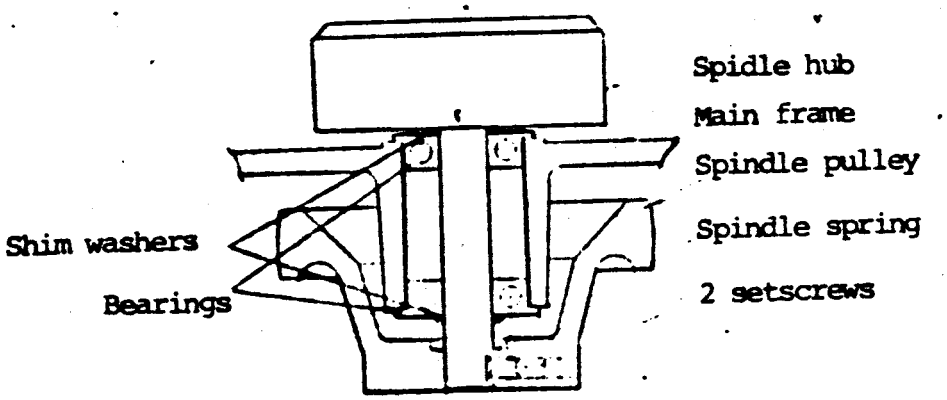
6.12 SPINDLE BEARINGS REMOVAL AND REPLACEMENT

1. Swing up carrier and turn drive to vertical position (side up, door forward).
2. Remove two setscrews holding spindle pulley.

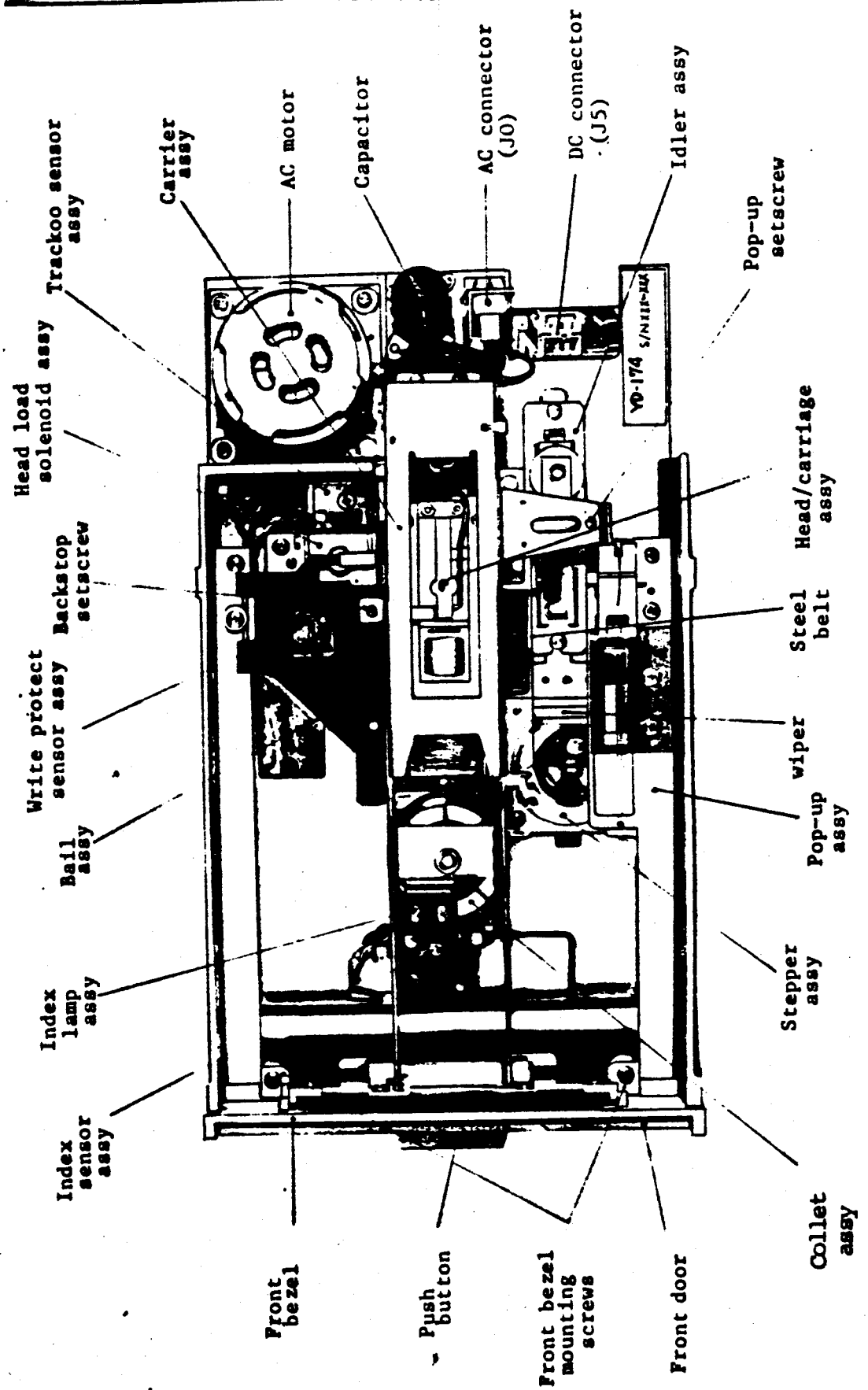
CAUTION; The spring-loaded pulley may fly out when the setscrews are removed.

3. Carefully withdraw spindle hub from opposite side of baseplate. Retain the shim washers which are on the spindle shaft.
4. Remove two spindle bearings from main frame.
5. Reverse the procedure for replacement.

NOTE; Use shim washers to obtain the same dimension as the old spindle. The distance from hub face, on which the Diskette sits, to the reference surface of baseplate should be identical to the unit previously removed.



1.0 PARTS/ASSEMBLIES LOCATIONS



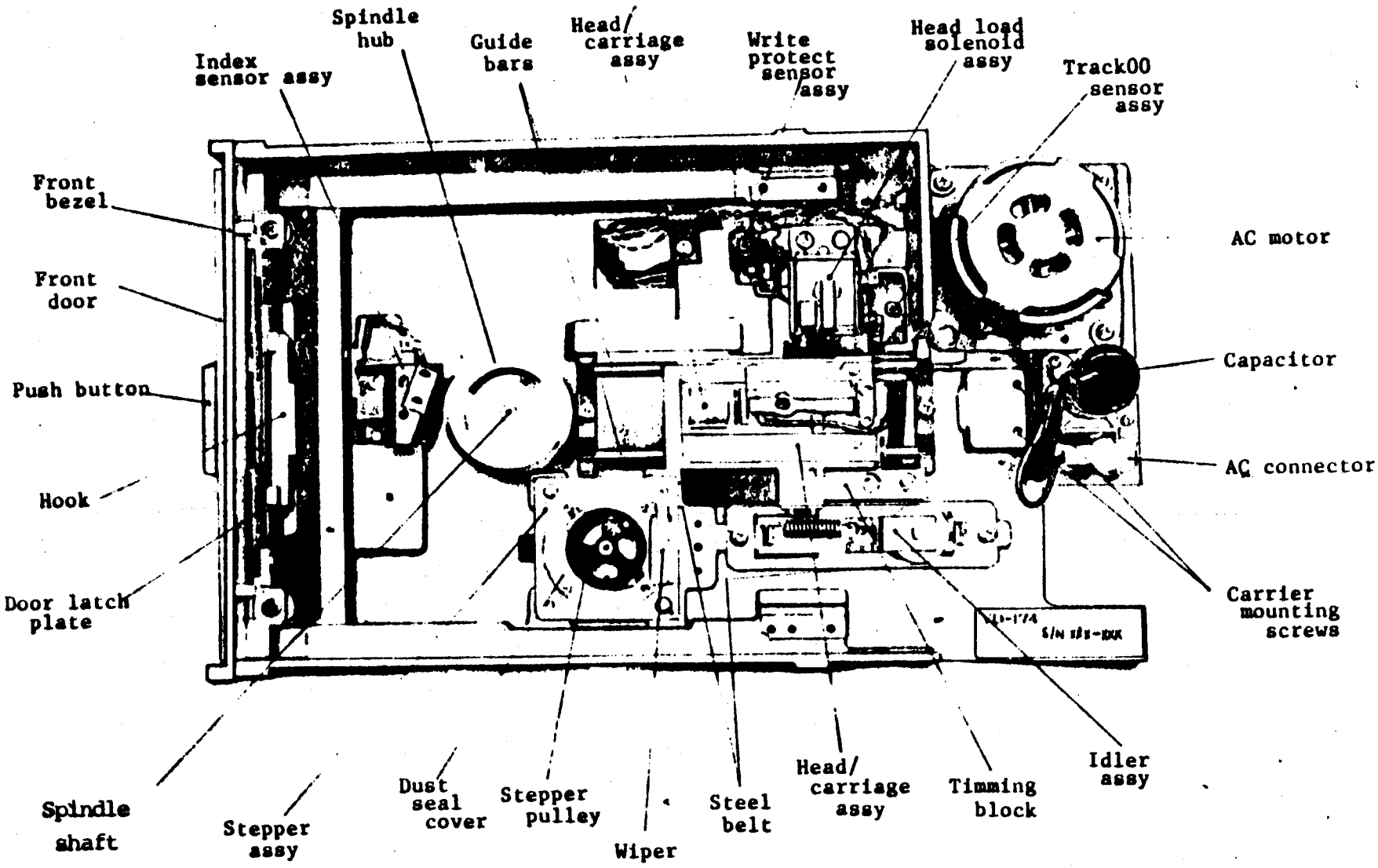


Fig.2 Top view of YD-174 with carrier,bail and pop-up assy removed

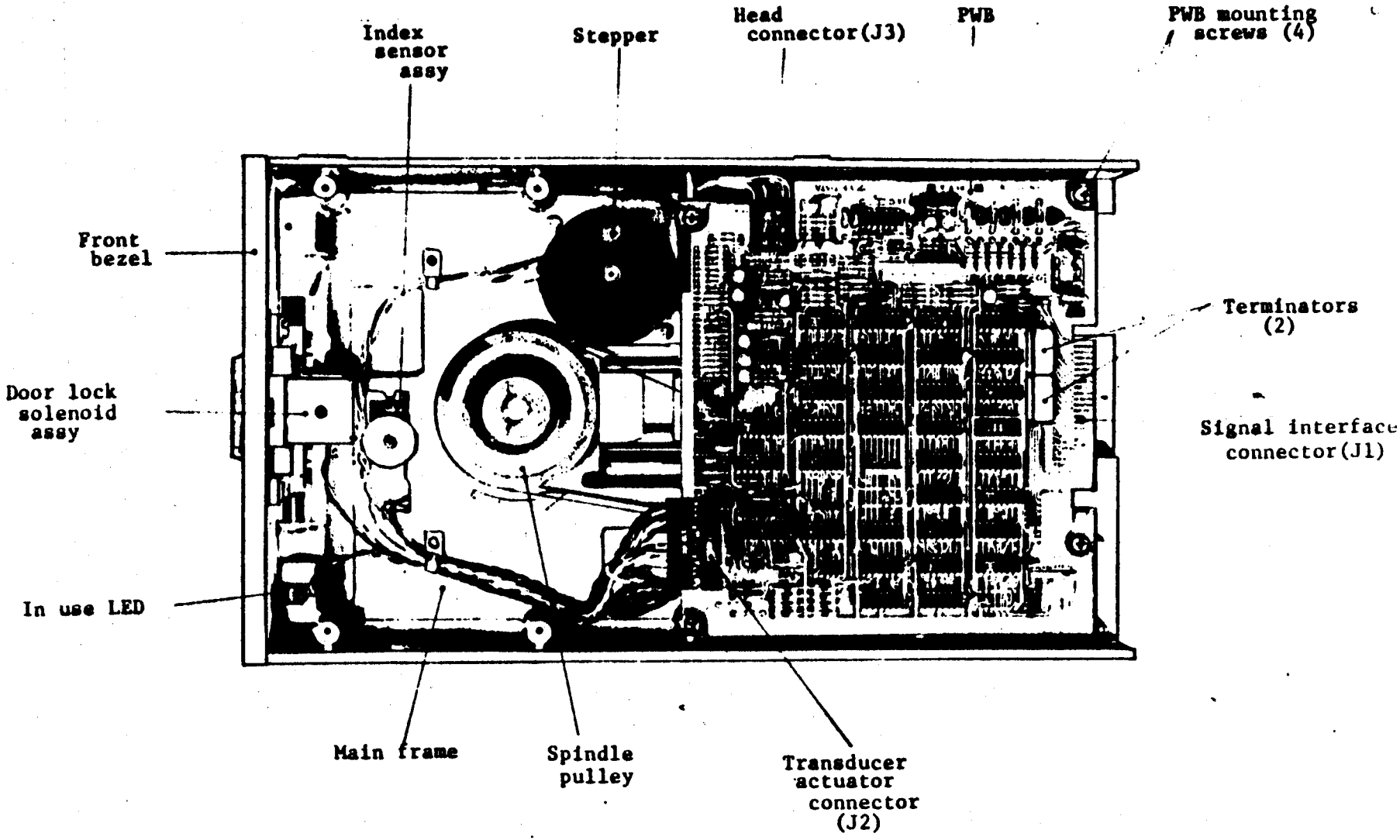


Fig.3 Rear view of YD-174

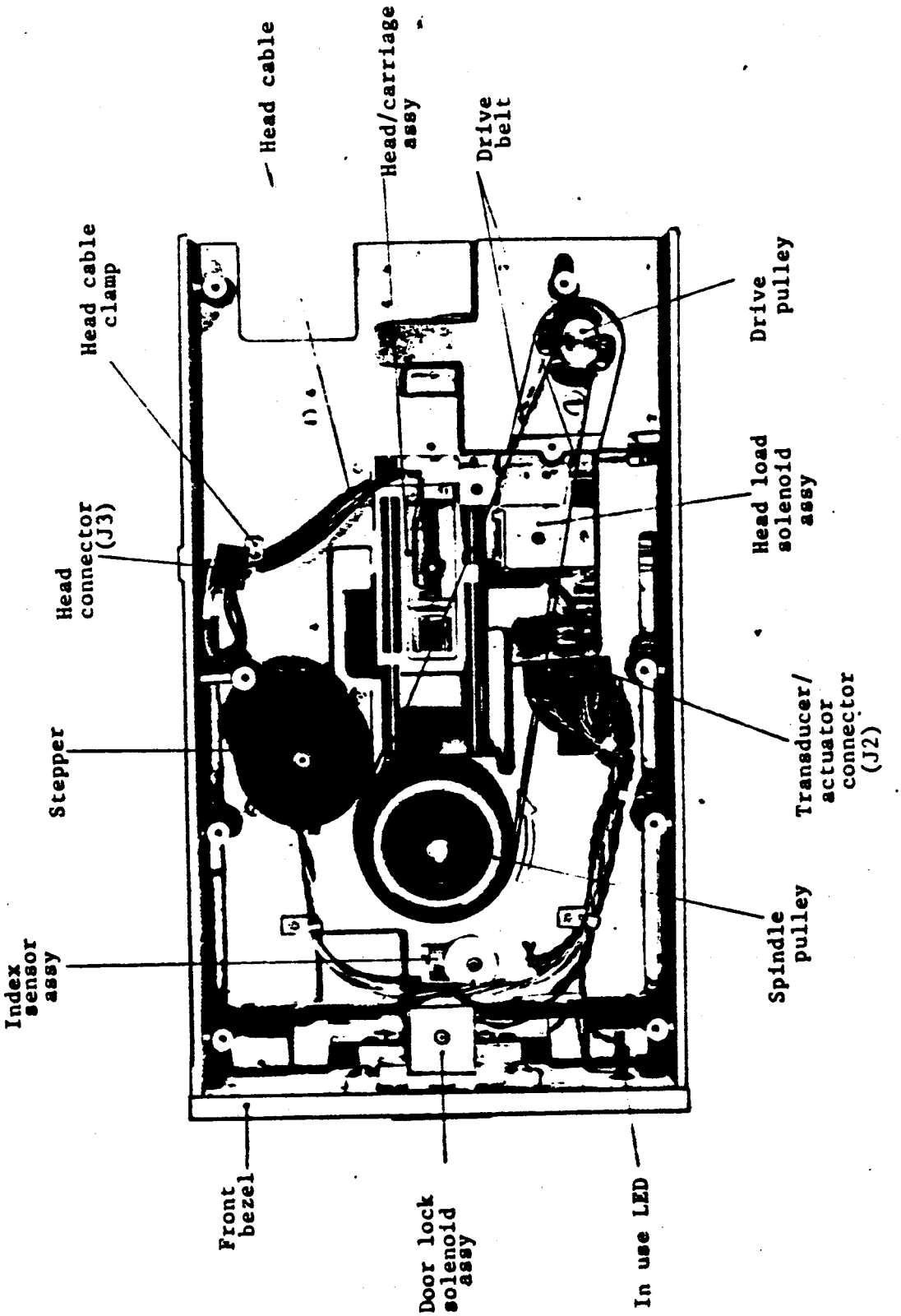


Fig.4 Rear view of YD-174 with PWB removed

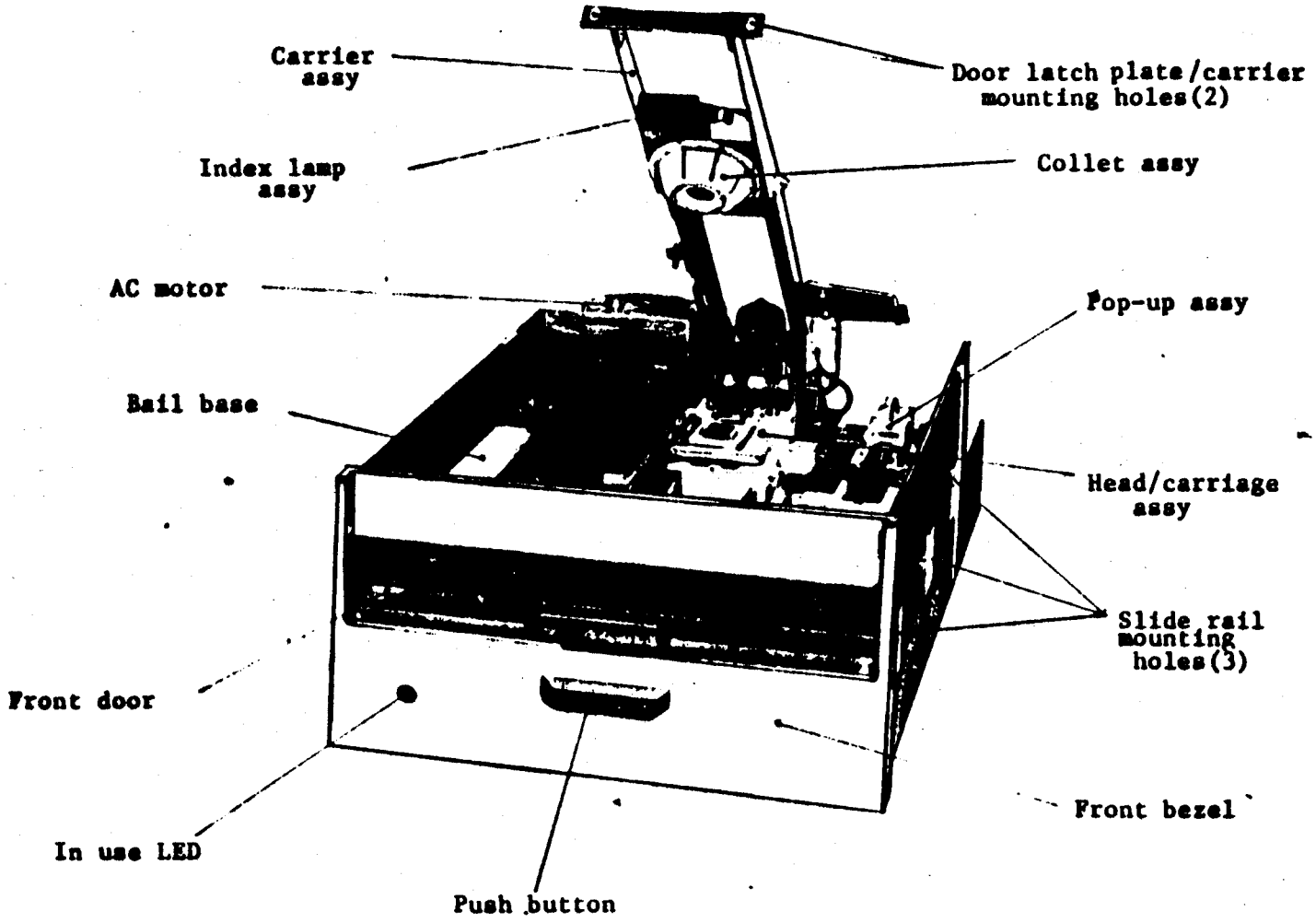


Fig 5 Front view of YD-174 with carrier open

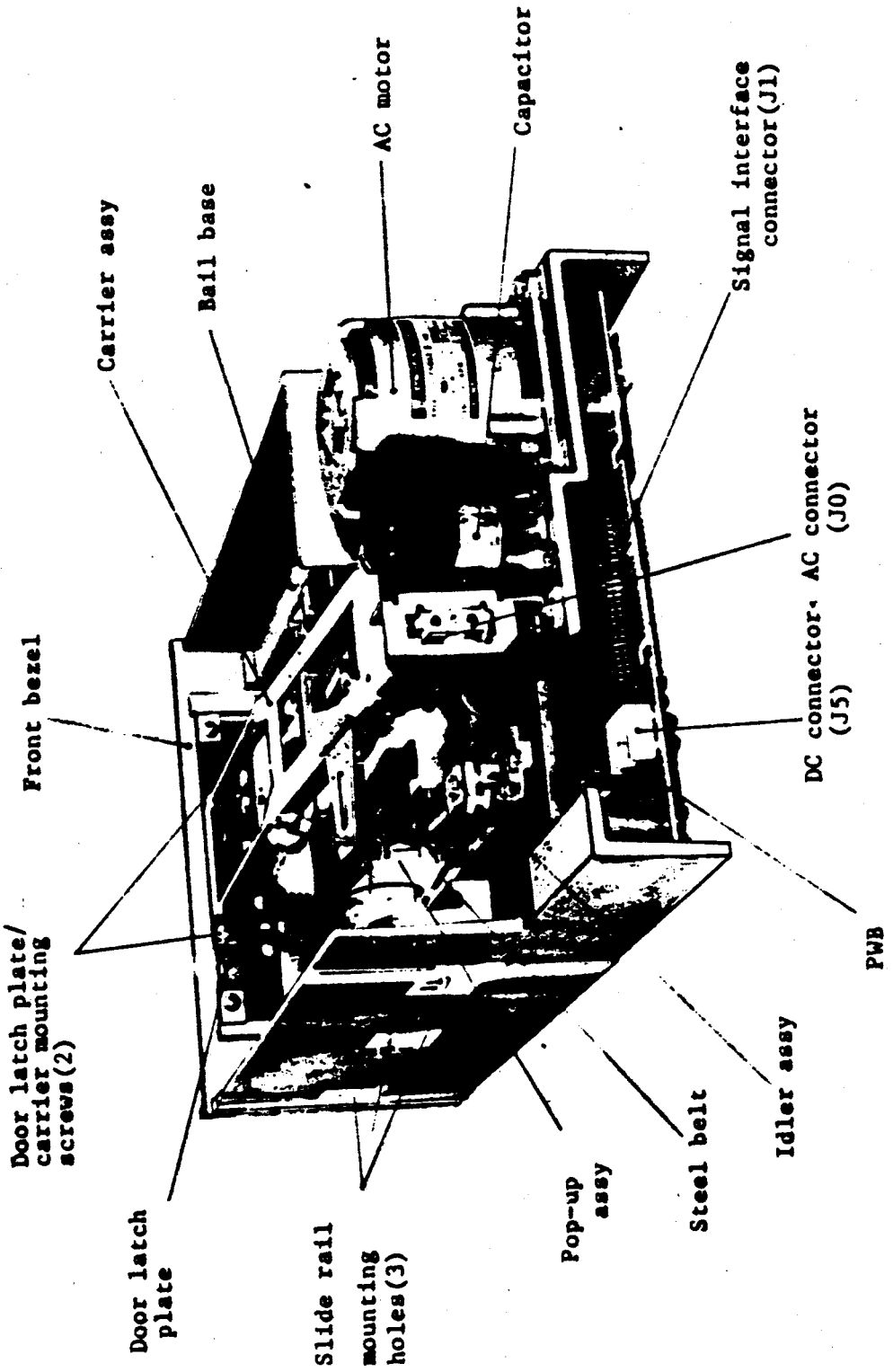


Fig.6 Rear view of YD-174

8.0 TEST POINTS/CONNECTOR PIN ASSIGNMENTS

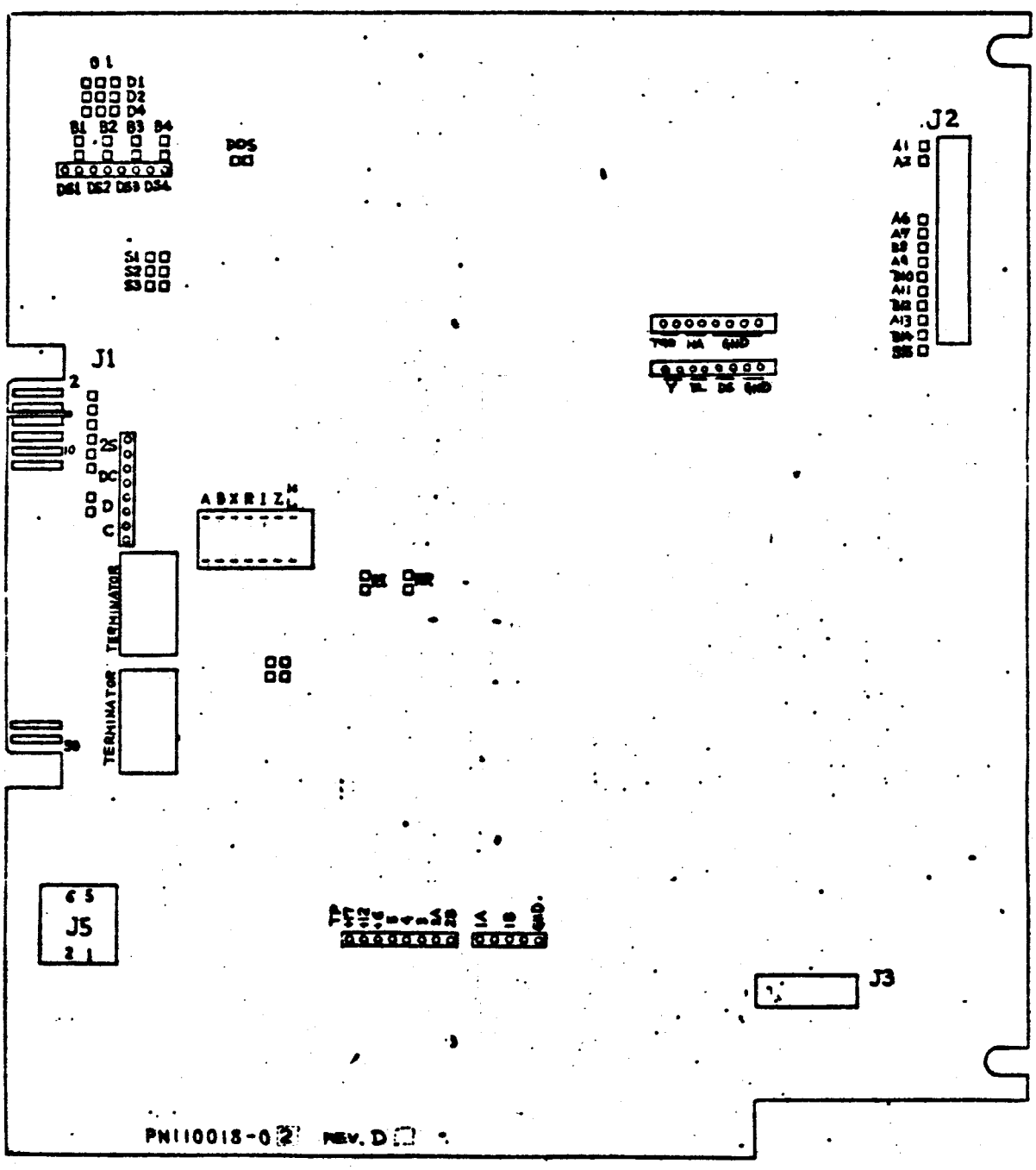


FIG.7 PWB TEST POINTS

INTERFACE - J1

PIN NO	SIGNAL NAME
1	RETURN
2	ALTERNATE 1/2
3	RETURN
4	ALTERNATE 1/2
5	RETURN
6	ALTERNATE 1/2
7	RETURN
8	ALTERNATE 1/2
9	RETURN
10	ALTERNATE 1/2
11	RETURN
12	ALTERNATE 1/2
13	RETURN
14	SIDE SELECT
15	RETURN
16	ALTERNATE 1/2
17	RETURN
18	ALTERNATE 1/2
19	RETURN
20	INDEX
21	RETURN
22	READY
23	RETURN
24	LOW CURRENT
25	RETURN
26	DRIVE SELECT 1
27	RETURN
28	DRIVE SELECT 2
29	RETURN
30	DRIVE SELECT 3
31	RETURN
32	DRIVE SELECT 4
33	RETURN
34	DIRECTION
35	RETURN
36	STEP
37	RETURN
38	WRITE DATA
39	RETURN
40	WRITE GATE
41	RETURN
42	TRACK 00
43	RETURN
44	WRITE PROTECT
45	RETURN
46	READ DATA
47	RETURN
48	RESERVED
49	RETURN
50	RESERVED

TRANSDUCERS - J2

PIN NO	SIGNAL NAME	COLOR
A15	IN USE LED RETURN	BLACK
B15	+IN USE LED	RED
A14	WP LED RETURN	BLUE
B14	+WP LED	ORANGE
A13	WP PTX RETURN	BLACK
B13	+WP PTX	RED
A12	TRK 00 LED RETURN	BLUE
B12	+TRK 00 LED	ORANGE
A11	TRK 00 PTX RETURN	BLACK
B11	+TRK 00 PTX	RED
A10		
B10		
A9		
B9		
A8	INDEX LED RETURN	BLACK
B8	+INDEX LED	RED
A7	INDEX PTX RETURN (DISK 1)	BLACK
B7	+INDEX PTX (DISK 1)	RED
A6	INDEX PTX RETURN (DISK 2)	BLUE
B6	+INDEX PTX (DISK 2)	ORANGE
A5	STEPPER ϕ_1	BLUE
B5	KEY	
A4	STEPPER ϕ_3	RED
B4	STEPPER ϕ_2	YELLOW
A3	STEPPER ϕ_4	GREEN
B3	STEPPER ϕ_C	WHITE
A2	-DOOR LOCK	BLACK
B2	DOOR LOCK +24VDC	RED
A1	-HEAD LOAD	BLACK
B1	HEAD LOAD +24VDC	RED

HEAD - J3

PIN NO.	SIGNAL NAME	COLOR
A7	W/R (HEAD 1)	WHITE
B7	W/R (HEAD 1)	WHITE
A6	W/R RETURN (HEAD 0)	BLUE
B6	W/R RETURN (HEAD 1)	BLUE
A5	W/R (HEAD 0)	BLACK
B5	W/R (HEAD 1)	BLACK
A4	ERASE RETURN (HEAD 0)	RED
B4	ERASE RETURN (HEAD 1)	RED
A3	ERASE (HEAD 0)	YELLOW
B3	ERASE (HEAD 1)	YELLOW
A2		
B2	KEY	
A1	SHIELD (HEAD 0)	
B1	SHIELD (HEAD 1)	

TEST POINTS

PIN NO	SIGNAL NAME
GND	GND
1B	PREAMP 1B
1A	PREAMP 1A
2B	PREAMP 2B
2A	PREAMP 2A
3	INDEX
4	ERASE
5	READ DATA
+6	+6V DC
+12	+12V DC
+17	+17V DC

DC - J5

PIN NO	SIGNAL NAME
1	+24 V DC
2	+24V RETURN
3	RESERVED
4	RESERVED
5	+5V DC
6	+5V GND

FIG.8 PWB INTERFACE

9.0 RECOMMENDED SPARE PARTS LIST

MAINTENANCE LEVEL 1

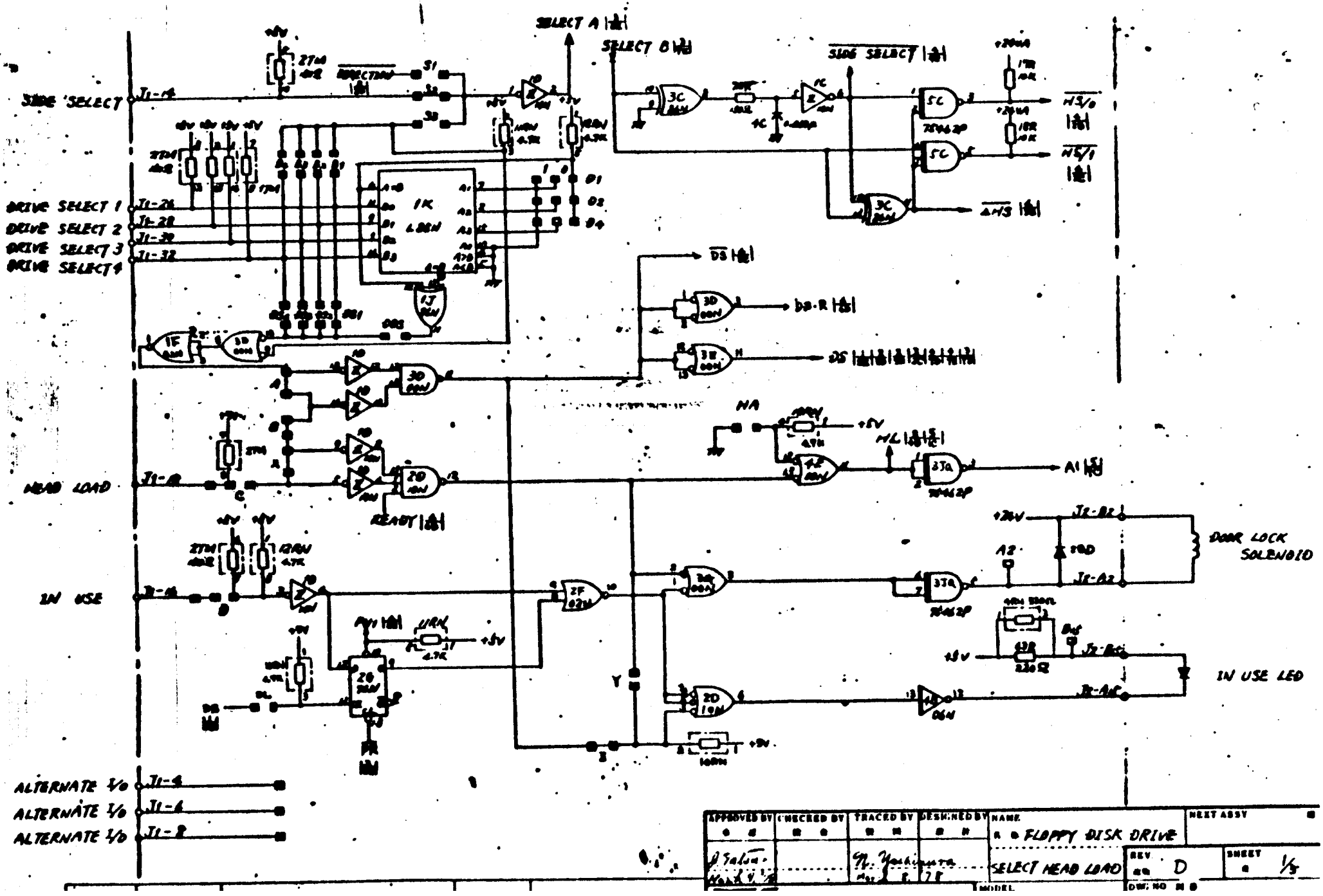
PART NUMBER	PART DESCRIPTION
110018-02	PWB
140099-01	Index Lamp Assy.
130052-01	Index Sensor Assy.
130044-01	Track 00 Sensor Assy.
130045-01	Write Protect Sensor Assy.
140025-01	In Use LED
140072-01	Drive Belt
140036-01	Drive Pulley (50 Hz)
140036-02	Drive Pulley (60 Hz)
140060-01	Wiper

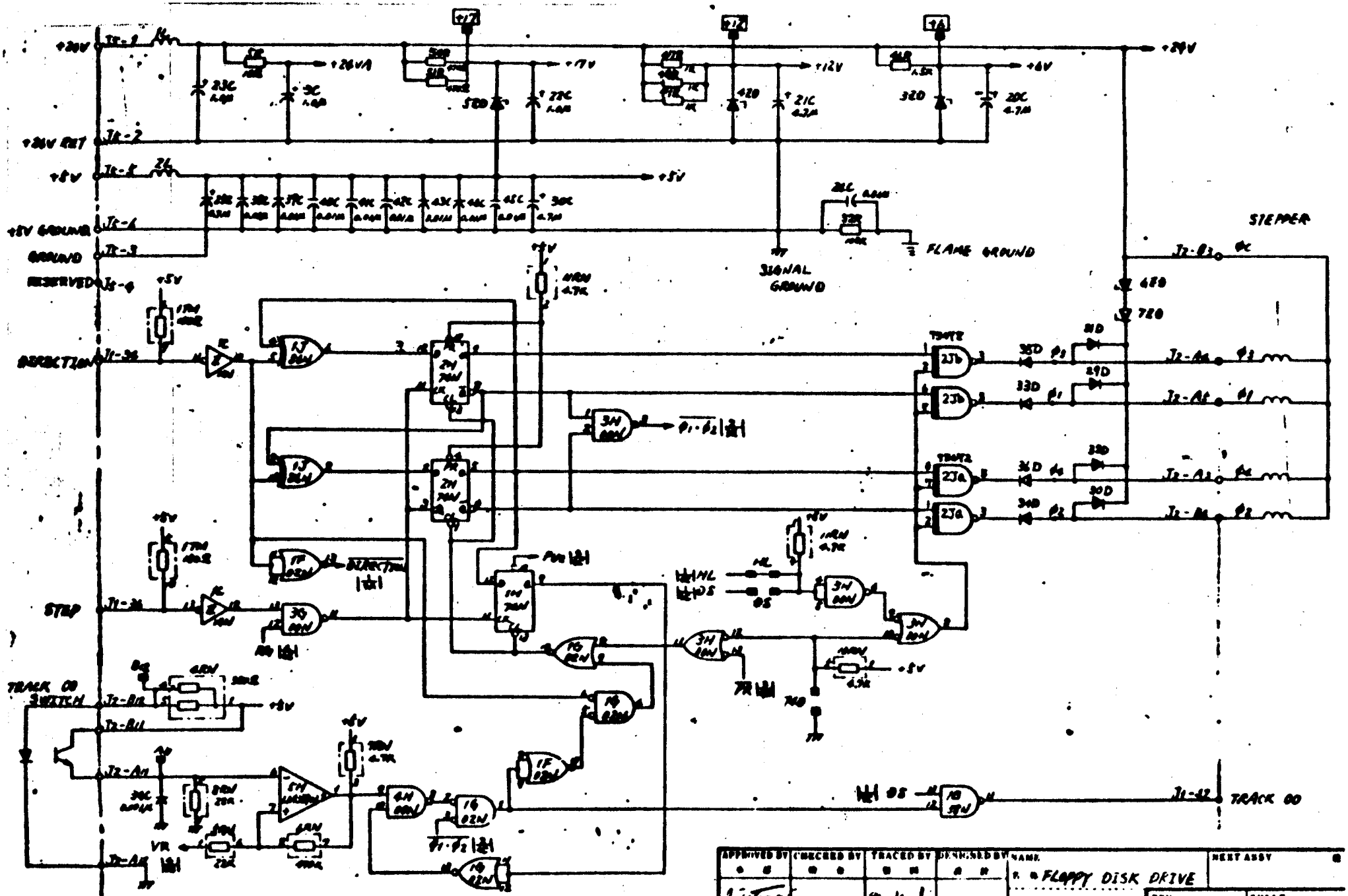
MAINTENANCE LEVEL 2

PART NUMBER	PART DESCRIPTION
140144-01	Drive Motor (115 V)
140144-03	Drive Motor (230 V)
120049-03	Carrier
130096-01	Pop-up Assy.
140045-04	Head Load Solenoid Assy.
120027-03	Bail Assy.
140223-01	Door Lock Solenoid Assy.
120057-02	Head/Carriage Assy.
140250-01	Steel Belt
130053-01	Dust Seal Cover
130023-01	Idler Assy.
120155-01	Front Bezel (Cosmetic,YD174-1213,IVO
120155-02	Front Bezel (Oversize,YD174-1212,IVO
120155-03	Front Bezel (Functional,YD174-1214,I
028238-22	Spindle Bearing
140222-02	Bail return spring

10.0 TYPICAL SCHEMATIC DIAGRAMS

This section contains detailed schematic diagrams which describe the performance of the YD-174.
Since there may be detailed differences between the logic appearing in this manual and that actually implemented in a given machine, these diagrams shoud not be used for faultfinding purposes. Aset of diagrams for this purpose are shipped with each machine.

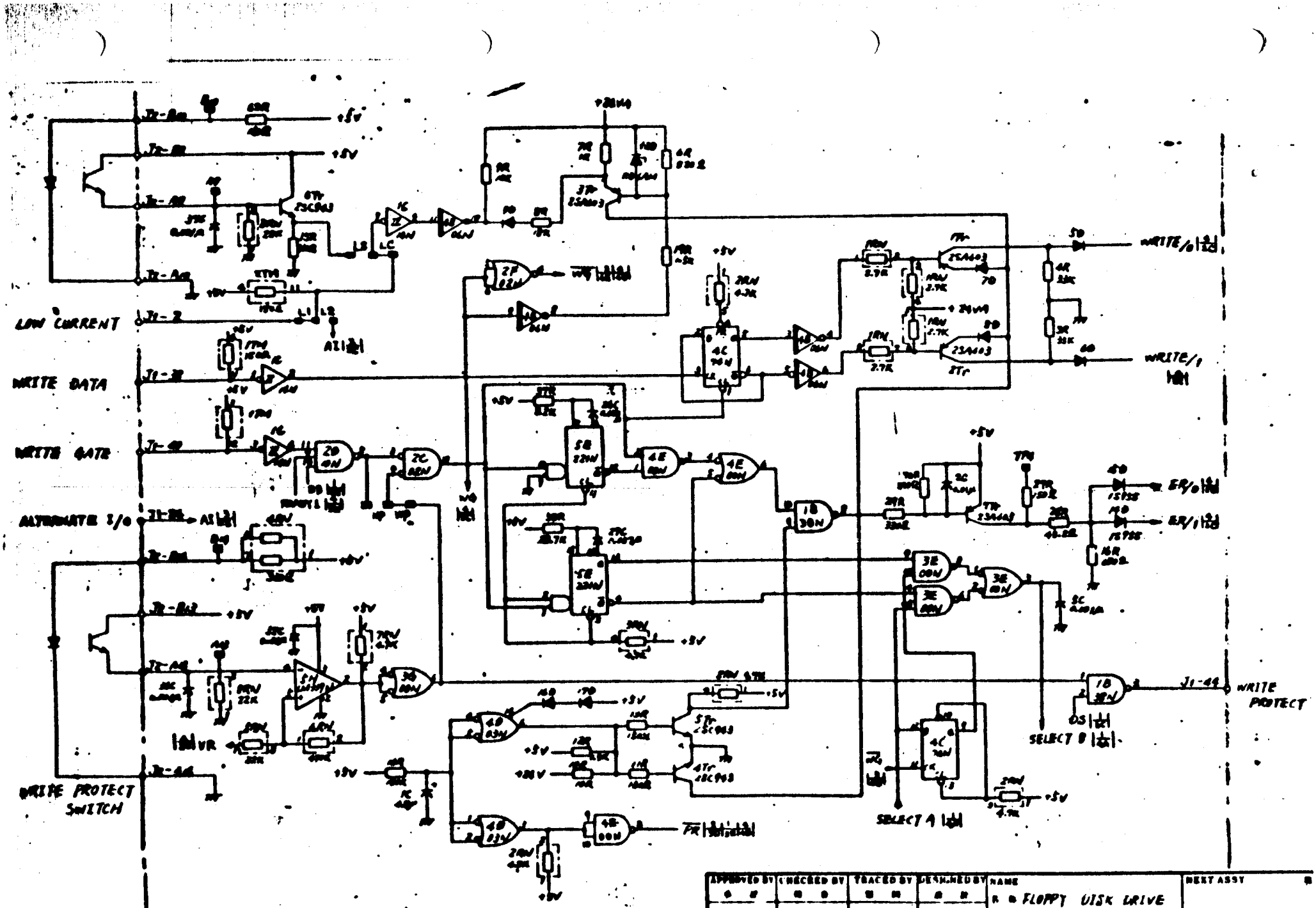

SELECT A
SELECT B
SIDE SELECT
SIDE SELECT
DRIVE SELECT 1
DRIVE SELECT 2
DRIVE SELECT 3
DRIVE SELECT 4
HEAD LOAD
IN USE
READY
HA
HL
A1
A2
DOOR LOCK SOLENOID
IN USE LED
ALTERNATE I/O
ALTERNATE I/O
ALTERNATE I/O
FLOPPY DISK DRIVE
SELECT HEAD LOAD
D
1/3



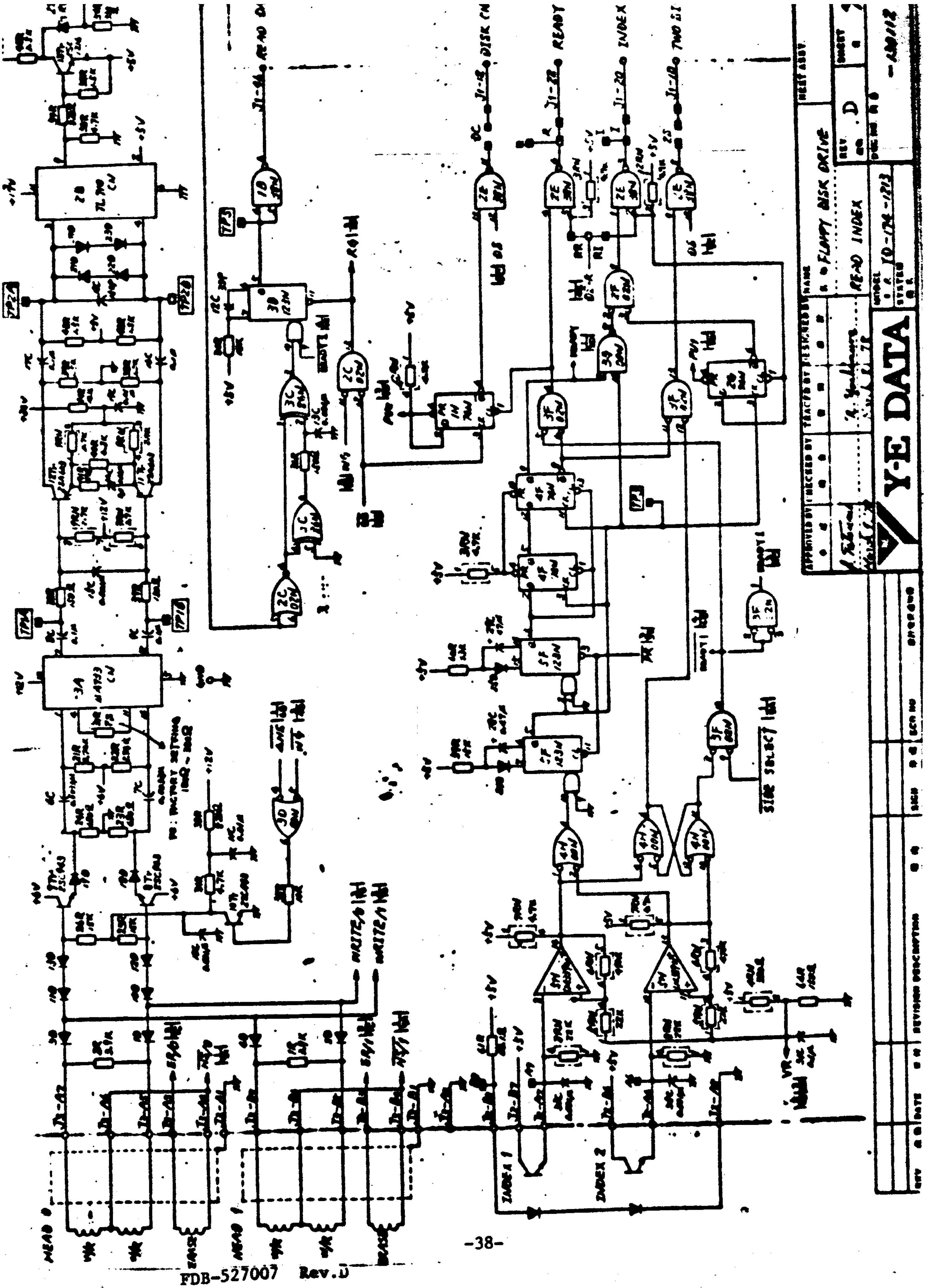
APPROVED BY	CHECKED BY	TRACED BY	DESIGNED BY	NAME	NEXT ASSY
		R. Yoshimura		FLOPPY DISK DRIVE	
				DC POWER STEPPER	REV D
				MODEL TD-174 1213	SHEET 3/5
				SYSTEM	DWG NO - 130112 -

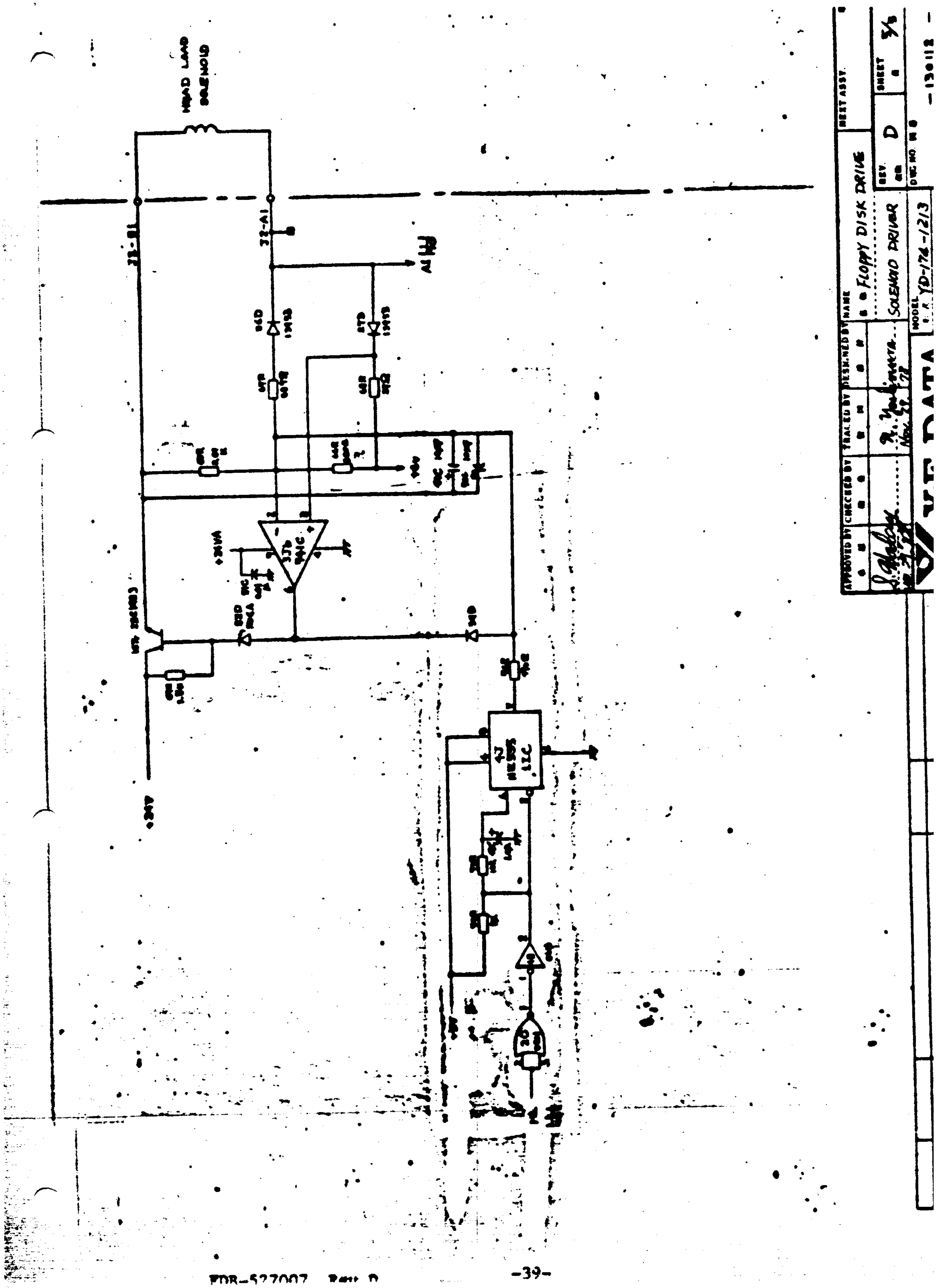
Y-E DATA

REV	DATE	REVISION DESCRIPTION	BY	ECO NO



APPROVED BY	CHECKED BY	TRACED BY	DESIGNED BY	NAME	NEXT ASSY
				FLOPPY DISK DRIVE	
		N. Yoshimura		WRITE	REV D
		March 8 '78			SHEET 3/5


Y-E DATA
FLOPPY DISK DRIVE
READ INDEX
READY
INDEX


HEAD LOAD SOLENOID
FLOPPY DISK DRIVE
SOLENOID DRIVER
YD-174-1213
D

11.0 Trouble shooting procedure

The trouble shooting procedures about the following error made are described in this section.

(1) NOT READY

(2) SEEK error

(3) READ error

(4) WRITE error

11.1 NOT READY

001

Check that the diskette is not visibly damaged or bound and is correctly inserted. Check that DRIVE SELECT pin (DS1 to DS4) and terminators on PWB are correctly inserted.

Is the spindle hub turning?

Y N

002

Is the drive motor turning?

Y N

003

. Measure AC line voltage at the motor connector.

Is measured voltage within limits?

Y N

004

Check the controller

005

. Check the motor connector and cables

. Remove drive belt

Does the motor start?

Y N

006

Remove binds if any.

If no binds, install a new drive motor (6.1)

007

Close the door

Is there a bind in the hub assembly?

Y N

008

. Install a new belt

. If trouble still exists, install a new drive motor (6.1)

009

Open the door

Is there still a bind in the hub assembly?

Y N

010

Replace carrier assembly (6.2) or collect assembly

011

Remove bind or replace the spindle assembly

015 012

001 002

012

Are any pulleys loose?

Y N

013

Go to NOT READY Step 003

014

Tighten loose pulleys (5.8)

015

Measure DRIVE SELECT 1 to 4 input on PWB.

NOTE: SIDE SELECT input should be inactive when Diskette 1 is inserted otherwise READY output is inactive.

Is proper DRIVE SELECT input in active?

Y N

016

Check the controller

017

Measure the following DC power voltages at the connector on PWB

+5v : 4.75 to 5.25v, +24v: 22.6 to 26.4v

Are the voltages within limits?

Y N

018

Check the controller

019

Perform Index sensor assembly service check (5.3.1)

Are the output voltages within limits?

Y N

020

Replace the Index sensor assembly.

021

Perform Index lamp assembly service check (5.2.1)

Are the output voltages within limits?

Y N

022

Replace the Index lamp assembly

023

021

023

If an oscilloscope is available check the diskette speed. Look for index pulses every 166.7 ± 3.3 ms at the following two test points on PWB

Test point J2-A7 with Diskette 1 inserted.

Test point J2-A6 with Diskette 2 or Diskette 2D inserted.

Is the Diskette rotational speed within limits?

Y N

024

Check carrier, door and bail assembly for defects that are visibly observed.

Do these parts appear to be correct?

Y N

025

Replace as required: carrier (6.2.3), door (6.6), bail (6.4)

026

Go to NOT READY Step 012

027

Replace PWB

1.2 SEEK ERROR

001

Check that the diskette is not visibly damaged or bound and is correctly inserted.

Check that DRIVE SELECT pin (DS1 to DS4) and Terminators on PWB are correctly installed.

Check the carriage guide bars and the steel belt for damage or dirt.

Check that the guide bar clamps and the steel belt is not loose.

Turn off power and manually move head carriage to approximately track 76.

Turn on power and issue "seek to track 00" command.

Does the head carriage go to track 00?

Y N

002

Measure DRIVE SELECT 1 to 4 input on PWB (J1-26 to J1-32)

NOTE: SIDE SELECT input should be inactive when Diskette 1 is inserted. Otherwise READY output is inactive.

Is proper DRIVE SELECT input in active?

Y N

003

Check the controller

004

Measure the following DC power voltages at the connector on PWB

+5V(J5-5); 4.75 to 5.25V; +24V(J5-1); 22.6 to 26.4V

Are the voltage within limits?

Y N

005

Check the controller

006

Is READY input active?

Y N

007

Go to NOT READY Step 001

017 008

001 006

008

Perform track 00 sensor assembly service check (5.4.1)

Is track 00 sensor assembly good?

Y N

009

Replace track 00 sensor assembly (5.4.2.)

010

Is direction input (J1-34) inactive (high)?

Y N

011

Check the controller

012

Is the period of STEP input (J1-36) larger than 3 ms?

Y N

013

Check the controller

014

Replace the PWB

Is start up good?

Y N

015

Return original PWB

GO TO SEEK ERROR Step 029

017 016

Verify fix

001

017

Issue the "seek to track 76" command

Does the head carriage go to track 76?

Y N

018

Is Direction input (J1-34) active (low)?

Y N

019

Check the controller

020

Replace PWB

Is start up good?

Y N

021

Return original PWB

GO TO SEEK ERROR Step 029

022

Verify fix

023

Do head carriage position service check (6.8.2)

Is the adjustment correct?

Y N

024

Readjust the carriage positioning (6.8.2)

025

Perform the random seek test

Are there seek error?

Y N

026

Verify fix

027

Replace PWB

Are there still seek error?

Y N

028

Verify fix

029

027

029

Return original PWB.

Remove the steel belt clamping screws on the carriage,manually move the head carriage.

Are there any binds in head carriage and guide bars?

Y N

030

Remove steel belt

Is there any bind in idler assembly?

Y N

031

Replace the stepper assembly (6.10)

032

Replace the idler assembly (6.11)

033

Replace the head carriage assembly (6.8.3)

..3 READ ERROR

001

Check that the diskette is not visibly damaged or bound and is correctly inserted.

Check that the DRIVE SELECT pin (DS1 to 4) and terminators on PWB are correctly installed.

Issue the Read command.

Measure DRIVE SELECT 1 to 4 input (J1-26-J1-32) on PWB.

Is proper DRIVE SELECT input in active?

Y N

002

Check the controller

003

Measure the following DC power voltages at the connector on PWB

+5v (J5-5); 4.75 to 5.25v, +24v (J5-1): 22.6 to 26.4v

Are the voltage within limits?

Y N

004

Check the controller

005

Is the head loaded?

Y N

006

Is Ready output active?

Y N

007

GO TO NOT READY Step 001

008

Replace PWB (5.1)

Is the head loaded?

Y N

009

Return original PWB

Replace head load solenoid assembly (6.5.2)

011 010

Verify fix

005

011

Does Read Error occur at the same sector of the same track?

N Y

012

Remove the diskette and insert another known-to-be-good diskette.

Verify fix

013

Measure the head preamplifer differential output voltage at the test points between Tp 1A and Tp 1B on PWB

Is the measured voltage greater than 50 mVpp?

Y N

014

Replace PWB (5.1)

Is the measured voltage greater than 50 mVpp?

Y N

015

Return original PWB (5.1)

Replace head carriage assembly (6.8.3)

016

GO TO READ ERROR Step 017

017

Measure the Index positioning timing by using CE disk.

Is the Index timing within limits?

Y N

018

Perform Index sensor assembly service check (5.3.1)

Are the output voltages within limits?

Y N

019

Replace the Index sensor assembly (5.3.2)

025 020

017 018

020

Perform Index lamp assembly service check (5.2.1.)

Are the output voltages within limits?

Y N

021

Replace the Index lamp assembly. (5.2.2)

022

Perform the read test

Are there read error?

Y N

023

Verify fix

024

Replace the head carriage assembly (6.8.3)

025

Measure the track positioning by using CE disk.

Is the track positioning within limits?

Y N

026

Adjust the track positioning (6.8.2)

027

If an osillo-scope (or counter) is available, check the diskette speed. Look for index pulses every 166.7 $\pm$ 3.3 ms at the following two test points on PWB.

Test point J1 - A7 with Diskette 1 inserted
Test point J1 - A6 with Diskette 2 or Diskette 2D inserted

Is the Diskette rotational speed within limits?

Y N

031 028

027 027

028

Is power frequency of drive motor correct?

Y N

029

Correct power frequency of drive motor

030

GO TO NOT READY Step 024

031

. Replace PWB (5.1)

Are there still read error?

Y N

032

Verify fix

033

Return original PWB

Replace the head carriage assembly (6.8.3)

1.4 WRITE ERROR

001

Check that the diskette is not visibly damaged or bound and is correctly inserted.

Check that the DRIVE SELECT pin (DS1 to 4) and terminators on PWB are correctly installed.

Issue the Write command.

Measure DRIVE SELECT 1 to 4 input (J1-26 - J1-32) on PWB.

Is proper DRIVE SELECT input in active?

Y N

| 002

| Check the controller

003

Measure the following DC power voltages at the connector on PWB

+5v (J5-5) 4.75 to 5.25v

=24v (J5-1) 22.6 to 26.4v

Are the voltage within limits?

Y N

| 004

| Check the controller

005

Check the diskette

Does there write protect notch exist on diskette?

N Y

| 006

| Change diskette to another one without write protect notch and

| GO TO WRITE ERROR Step 007

007

Is the head loaded?

Y N

| 008

| GO TO READ ERROR Step 006

009

Check the WRITE PROTECT SENSOR ASSEMBLY (5.5.1)

Y N

| 010

| Replace the WRITE PROTECT SENSOR ASSEMBLY

011

009

011

Does Write Error occur at the same sector of the same track?

N Y

012

Remove the diskette and insert another known to be a good diskette.

Verify fix

013

Perform the Read Only test with diskette written another good drive

Are there Read error?

Y N

031

Verify fix

032

Replace PWB (5.1)

Are there still Write error?

Y N

032

Verify fix

033

Return original PWB.

Replace head carriage. (6.8.3)

RETURN LETTER

Title: THE TWO-SIDED FLOPPY DISK DRIVE YD-174 Maintenance Manual RCSL No.: 44-RT1991

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