

AMIGA EXTERNAL DRIVE MODEL 1010

ASSEMBLY LEVEL REPAIR PN 314039-01

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INTRODUCTION

The AMIGA 1010 Assembly Level Repair module is divided into 3 sections:

- Section 1: Set-up & Test**
- Section 2: External Drive Disassembly**
- Section 3: External Drive Assembly**

Section 1 is intended to instruct the technician in proper set-up and diagnosis of problems to the ASSEMBLY LEVEL. Assembly level may be defined as those portions of the unit that may be easily disassembled and replaced without involvement with chip/component repair.

Section 2 is a step-by-step illustration of how to remove the various assemblies from the unit. An overview of the assemblies is given on page 2-1.

Section 3 is a guide to re-assembling the drive after a repair is completed.

WARRANTY REPAIR is to be accomplished at the ASSEMBLY LEVEL. That is, as it is described within these 3 sections. Out-of-warranty repair at the component (chip) level will be introduced to the AQS center in a timely manner.

SECTION 1. SET-UP & TESTING

1.1 OVERVIEW

There are 2 main assemblies that could fail in the 1010 external drive. They are the drive mechanism and the interface PCB with cable. The 1010 is powered by the AMIGA; therefore, it does NOT contain a power supply.

The first step in troubleshooting a 1010 is to duplicate the customer complaint to verify that the problem is in fact the external drive and not the computer or the software.

The test procedures that follow are based upon using a "Known Good" AMIGA computer and diskettes.

NOTE

Before proceeding **VERIFY** that connector J7 on the AMIGA COMPUTER mother board has ALL pins. A few units have been discovered with pin 23, + 12V, missing. At this time, we believe this problem has been corrected but feel that you should be aware of the situation.

When a 1010 external drive is connected to the AMIGA, the internal drive is configured as DF0 and the 1010 drive becomes DF1.

1.2 PRELIMINARY NOTES

Required Equipment:

- Kickstart Disk *
- Workbench Disk *
- Blank Disk or Disk for Testing
- Monitor
- Amiga Computer
- Known Good Drive Mechanism

OPTIONAL: Service Diagnostic Aide

*Version 1.0 or 1.1 may be used.

If a SOFTWARE PROBLEM is suspected, verify that the software package operates CORRECTLY ON A "Known Good" system before beginning test on the "Suspected Bad" system.

1.2.1 ALWAYS turn the computer OFF when installing or removing a peripheral device, for example the 1010, 1020 or 1050.

1.2.2 When the system is POWERED-DOWN, it should be left OFF for at least 5 seconds before it is powered up again.

IF THIS IS NOT DONE, THE AC POWER SWITCH MAY FAIL.

Whenever possible, RESET the system by depressing the "CNTRL" key and both "A" keys, simultaneously.

1.2.3 It may be necessary to insert a diskette MORE THAN ONCE before it is seated correctly in the drive. Continued difficulty in correctly seating the disk indicates a defective or incompatible disk or a drive mechanical problem.

1.2.4 NEVER remove a disk when the DISK ACCESS LED is ON. Damage to the disk may result. If the system LOCKS-UP, RESET it by depressing the "CNTRL" key and both "A" keys, simultaneously.

1.2.5 If an assembly is replaced, ALL case and shield screws must be re-installed.

IF SCREWS ARE MISSING, EXCESSIVE RF NOISE MAY RESULT.

1.3 SYSTEM POWER UP

1.3.1 Connect AC power, the keyboard, a mouse (if not available, see below), the monitor and the 3.5" external drive to the AMIGA computer. DO NOT connect any other devices to the computer at this time.

Mouseless Operation of the Amiga

On the AMIGA, anything you can do with the mouse you can also do from the keyboard:

- Pressing, at the same time, an AMIGA key and one of the cursor keys (the keys with arrows on top that are to the right of and slightly below the RETURN key) moves the Pointer in the direction of the arrow.
- Pressing, at the same time, an AMIGA key, the SHIFT key, and one of the cursor keys also moves the Pointer, but faster.
- Pressing, at the same time, the left AMIGA key and the left ALT key (the key just to the left of the left AMIGA key) is like pressing the Selection button, the left button on the mouse.
- Pressing, at the same time, the right AMIGA key and the right ALT key (the key just to the right of the right AMIGA key) is like pressing the Menu button, the right button on the mouse.

1.3.2 Turn the POWER SWITCH, located on the left side of the computer toward the front, to the ON position. The 3.5 external drive does not have its own power supply and is powered by the computer.

1.3.3 The RED Power LED, located at the left front corner of the computer, should BLINK on system power-up, then display solid red. The LED of the external drive should remain off until a disk is inserted. If a disk is already in the external drive (not recommended), the AMIGA will not access it until the WORKBENCH is loaded.

1.3.4 In approximately 20 seconds, the screen should turn white and, approximately 5 seconds later, a hand should be displayed holding a diskette labeled KICKSTART.

The system is requesting the Boot-Up diskette, called KICKSTART, to be inserted.

1.3.5 Insert the diskette labeled KICKSTART into the INTERNAL drive.

At this time, the screen should turn white as the system loads the disk. The drive activity light will flash briefly and the drive access sounds should be heard. After approximately 30 seconds and some screen changes, the system should display a hand holding a diskette labeled WORKBENCH.

- If the hand holding the diskette labeled KICKSTART REAPPEARS, re-seat the diskette and RETRY. If after 3 or 4 retries, the system still does not accept the KICKSTART diskette, try a DIFFERENT COPY of the disk.
- If the disk still WILL NOT LOAD, refer to the AMIGA 1000 ASSEMBLY LEVEL REPAIR, 1.7 DRIVE ASSEMBLY CHECK.

1.3.6 Remove the KICKSTART disk.**1.3.7** Insert the diskette labeled WORKBENCH into the INTERNAL drive.

At this time, the screen will turn white for approximately 2 seconds and then display the boot-up message while continuing to load from the disk.

- If the hand holding the diskette labeled WORKBENCH REAPPEARS, re-seat the diskette and RETRY. If after 3 or 4 retries, the system still does not accept the WORKBENCH diskette, try a DIFFERENT copy of the disk.
- If the disk STILL WILL NOT LOAD, refer to the AMIGA 1000 ASSEMBLY LEVEL REPAIR, 1.7 DRIVE ASSEMBLY CHECK.

When loading is complete, the screen will be blue with the WORKBENCH DISK ICON in the upper right hand corner. The TITLE BAR message will be:

Amiga Workbench Version 1.0 167840 free memory
or
Workbench release 1.1: 141496 free memory

1.4 EXTERNAL DRIVE TEST

NOTE: WRITE-PROTECT ALL VOLUME DISKS BEFORE BEGINNING!

- Slide the write-protect tab up toward the edge of the disk to expose the small hole in the disk case.

1.4.1 Remove the WORKBENCH DISK from DF0 (internal drive) and insert it into DF1 (external drive).

When the disk is inserted, the external drive LED will flash. The WORKBENCH ICON will remain on the screen.

1.4.2 Select the WORKBENCH DISK with the mouse.

With the pointer on the WORKBENCH DISK ICON, double-click the left mouse button. The WORKBENCH WINDOW will be displayed.

The LED will flash as the WORKBENCH window is being loaded from DF1.

- If the WORKBENCH window will not load from the 1010, refer to 1.5 DRIVE ASSEMBLY CHECK and 1.6 EXTERNAL DRIVE INTERFACE PCB.

1.4.3 Select INFO from the TITLE BAR MENU.

Press and hold the right mouse button while sliding the pointer to the upper left corner of the title bar. When the pointer is over the word Workbench, the word will highlight and the menu selection will be displayed.

Continue to depress the right mouse button and slide the pointer down to the word INFO and, when INFO is highlighted, release the right mouse button.

The INFO WINDOW will be displayed.

The STATUS window should indicate READ ONLY.

- If the status is READ/WRITE, the WRITE-PROTECT SENSOR is not operating properly and a drive replacement is necessary. Refer to SECTION 2 DRIVE DISASSEMBLY.

1.4.4 Record the SIZE information for the disk to use as a comparison when your DISKCOPY is complete.

1.4.5 Select QUIT in the lower right-hand corner of the window.

With the mouse, move the pointer onto QUIT and click the left button once.

1.4.6 Remove the VOLUME WORKBENCH disk from DF1 and return it to DF0.

1.4.7 Insert a TEST or BLANK DISK that is NOT write-protected into DF1.

An additional ICON will appear on the screen.

1.4.8 COPY the VOLUME WORKBENCH DISK onto the TEST DISK.

With the mouse, move the pointer to the WORKBENCH ICON. Press and HOLD the LEFT MOUSE button. When the red ⊕ symbol appears, slide it onto the DF1 ICON and release.

The DISKCOPY window will appear.

1.4.9 Select CONTINUE from the DISKCOPY window.

Once you are certain that your "FROM" and "TO" disks are correctly inserted, move the pointer to CONTINUE and click the left mouse button once.

DF0 AND DF1 BUSY will be displayed during the copy process.

WHEN THE DISKCOPY is completed the window will clear and an ICON for the copy of WORKBENCH will be displayed.

- During the DISKCOPY the drive is writing, reading and verifying data. If the copy is completed without a problem continue to 1.4.10.
- If a problem is encountered, try a DIFFERENT DESTINATION DISK or a DIFFERENT SOURCE DISK.
- If the problem continues, refer to 1.5 DRIVE ASSEMBLY CHECK.

1.4.10 Remove both DISKS from their respective drives.

1.4.11 Insert the COPY OF WORKBENCH into DF0, the internal drive.

1.4.12 RE-BOOT the system.

The system will now load the WORKBENCH from the copy disk.

- If a problem is encountered, a write or compatibility problem exists with the external drive. Refer to 1.5 DRIVE ASSEMBLY CHECK.

1.4.13 Select the COPY OF WORKBENCH ICON with the mouse.

With the pointer on the DISK ICON, double-click the left mouse button. The WORKBENCH WINDOW will be displayed.

1.4.14 Select the UTILITIES DRAWER with the mouse.

With the pointer on the UTILITIES DRAWER, double-click the left mouse button. The UTILITIES WINDOW will appear.

1.4.15 Select the NOTEPAD ICON.

With the pointer on the NOTEPAD ICON, double-click the left mouse button.

1.4.16 Select the SAPPHIRE 19 FONT.

When the NOTEPAD WINDOW appears, move the pointer to the TITLE BAR. Depress the right mouse button and slide the pointer to FONT. Still holding the right mouse button, slide the pointer down to SAPPHIRE and then across and down to 19. When SAPPHIRE and 19 are both highlighted, release the mouse button.

- If the NOTEPAD and FONT loaded without difficulty, DF0 has been able to read TRACK 79 of the disk that was just written in DF1. Alignment and drive speed problems are usually detected above TRACK 75. Therefore, the COPY can be considered "good".
- If the NOTEPAD and FONT will NOT load, DF0 cannot read what was written by DF1. Refer to 1.5 DRIVE ASSEMBLY CHECK.

1.5 DRIVE ASSEMBLY CHECK

1.5.1 Follow the DISASSEMBLY sequence in SECTION 2 to obtain access to the drive.

1.5.2 To check the DRIVE ASSEMBLY in an external unit, disconnect the power and ribbon cables from the back of the drive. Place a "known good" drive assembly on top of the bottom RFI shield and connect the cables to it.

1.5.3 Power-up the system and begin testing from the start.

- If the system now PASSES all tests, EXCHANGE the DRIVE ASSEMBLY in the external unit.
- If the system still FAILS, the INTERFACE PCB may be at fault.

Refer to 1.6, EXTERNAL DRIVE INTERFACE PCB.

1.6 EXTERNAL DRIVE INTERFACE PCB

1.6.1 DISK INTERFACE SIGNALS

The signals involved with interfacing the AMIGA computer and an external drive are as follows:

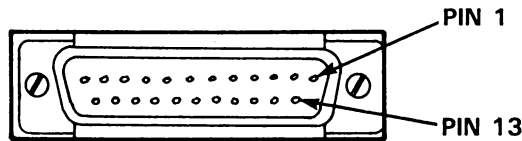


Fig. 1-1. J7 Female AMIGA Connector

1	$\overline{\text{RDY}}$	Disk Ready — Active LOW
2	$\overline{\text{DKRD}}$	Disk READ DATA — Active LOW
3-7	GND	Ground
8	$\overline{\text{MTRXD}}$	Disk MOTOR control — Active LOW
9	$\overline{\text{SEL2B}}$	SELECT drive 2 — Buffered, Active LOW
10	$\overline{\text{DRESB}}$	Disk RESET — Buffered, Active LOW
11	$\overline{\text{CHNG}}$	Disk CHANGE sense. When disk has been removed from drive, latched high until heads are stepped — Active LOW
12	+5V	
13	$\overline{\text{SIDE B}}$	Select a specific HEAD — Buffered, LOW = UPPER head, HIGH = LOWER head
14	$\overline{\text{WPRO}}$	Disk is WRITE PROTECTED — Active LOW
15	$\overline{\text{TK0}}$	Disk heads currently positioned at TRACK 0 / — Active LOW
16	$\overline{\text{DKWEB}}$	Disk WRITE ENABLE — Buffered, Active LOW
17	$\overline{\text{DKWDB}}$	Disk WRITE DATA — Buffered, Active LOW
18	$\overline{\text{STEPB}}$	STEP the heads of the disk — Buffered, Active LOW
19	DIRB	Disk head seek DIRECTION — Buffered, LOW = Toward Center Spindle, HIGH = Toward TRK 0 (Outer Edge of Dsk)
20	$\overline{\text{SEL3B}}$	SELECT drive 3 — Buffered, Active LOW
21	$\overline{\text{SEL1B}}$	SELECT drive 1 — Buffered, Active LOW
22	$\overline{\text{INDEX}}$	Disk INDEX pulse — Active LOW
23	+12V	

1.6.2 Follow the DISASSEMBLY sequence in SECTION 2 to obtain access to the interface PCB.

1.6.3 Assuming that you are using a "Known Good" AMIGA to test the 1010, proceed to 1.6.4, interface PCB layout and schematic and trace the signals listed in 1.6.1 through the interface circuitry.

1.6.4 INTERFACE PCB ASSY. #327204

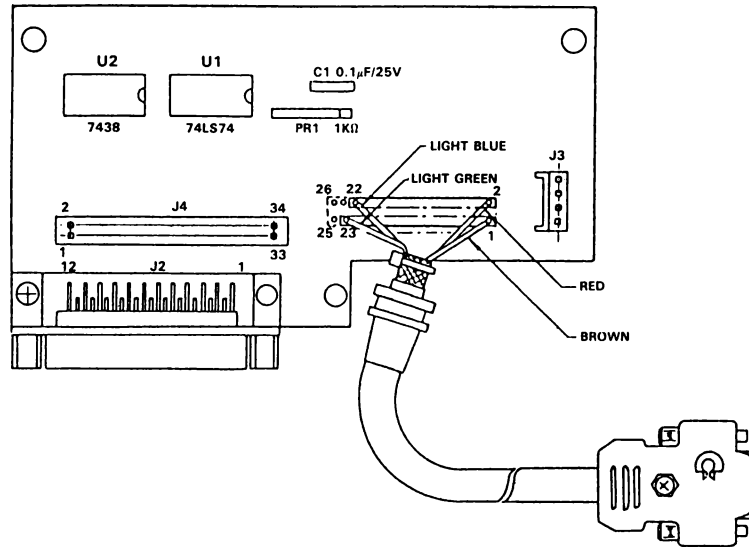


Fig. 1-2. Board Layout

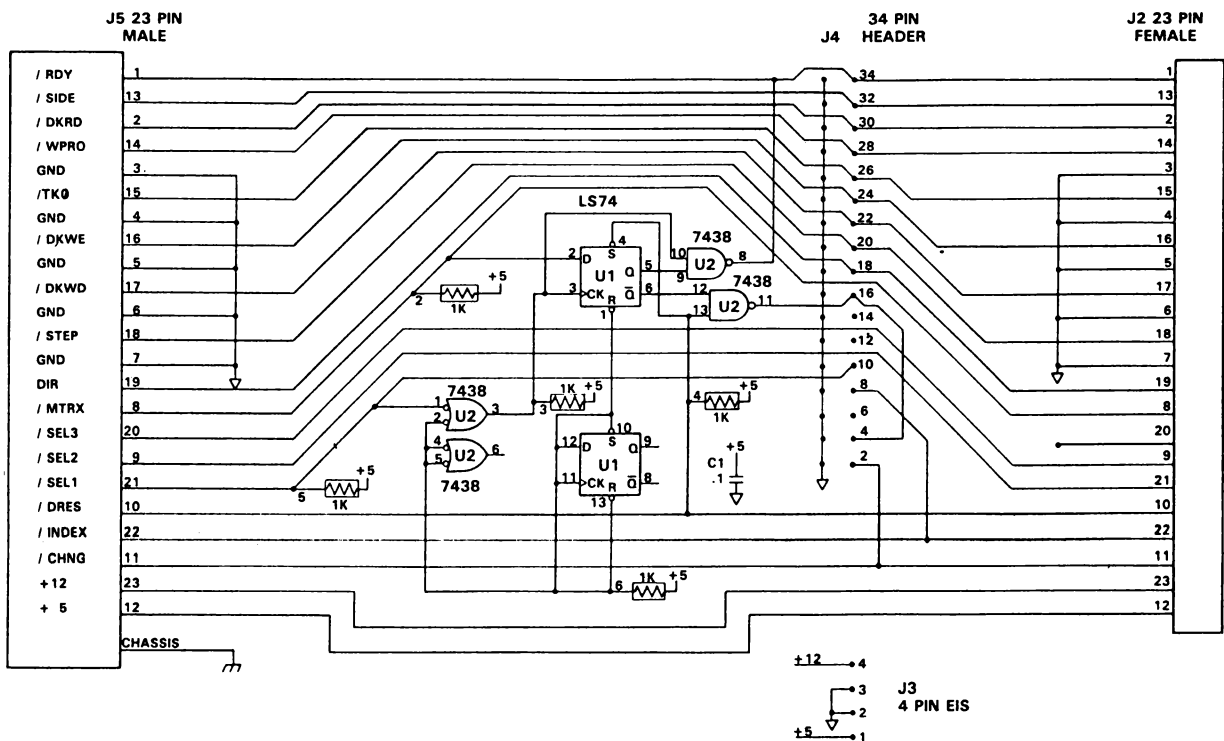
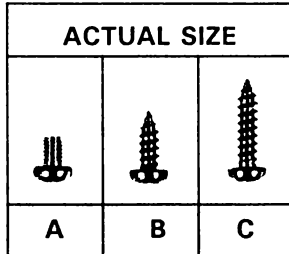


Fig. 1-3. Interface Schematic

SECTION 2. 3.5" EXTERNAL DRIVE DISASSEMBLY

2.1 ASSEMBLY OVERVIEW



POS.	DESCRIPTION	PART NO.
1	TOP CASE	327011-01
2	RFI TOP SHIELD	327116-01
3	DRIVE MTG. BRACKET-NEC DRIVE MTG. BRACKET-PANA	327143-01 327144-01
4	3.5" DRIVE ASSY-NEC 3.5" DRIVE ASSY-PANA	327141-01 327142-01
5	DISK EJECT BUTTON-NEC DISK EJECT BUTTON-PANA	327006-01 328117-01
6	INTERFACE PCB ASSY	327204-01
7	INTERFACE CABLE ASSY	327164-01
8	CABLE CLAMP ASSY	327208-01
9	RFI BOTTOM SHIELD	327117-01
10	BOTTOM CASE	327010-01
11	LED ASSY-NEC LED ASSY-PANA	327175-01 327175-02
12	RUBBER FOOT	327053-01
13	FRONT BEZEL	327012-01
14	NAMEPLATE-AMIGA LOGO	327113-01
PARTS NOT ILLUSTRATED: RIBBON CABLE ASSY-DATA 327206-01 CABLE ASSY-POWER 327207-01 USERS INSTRUCTION SHEET 327202-01		

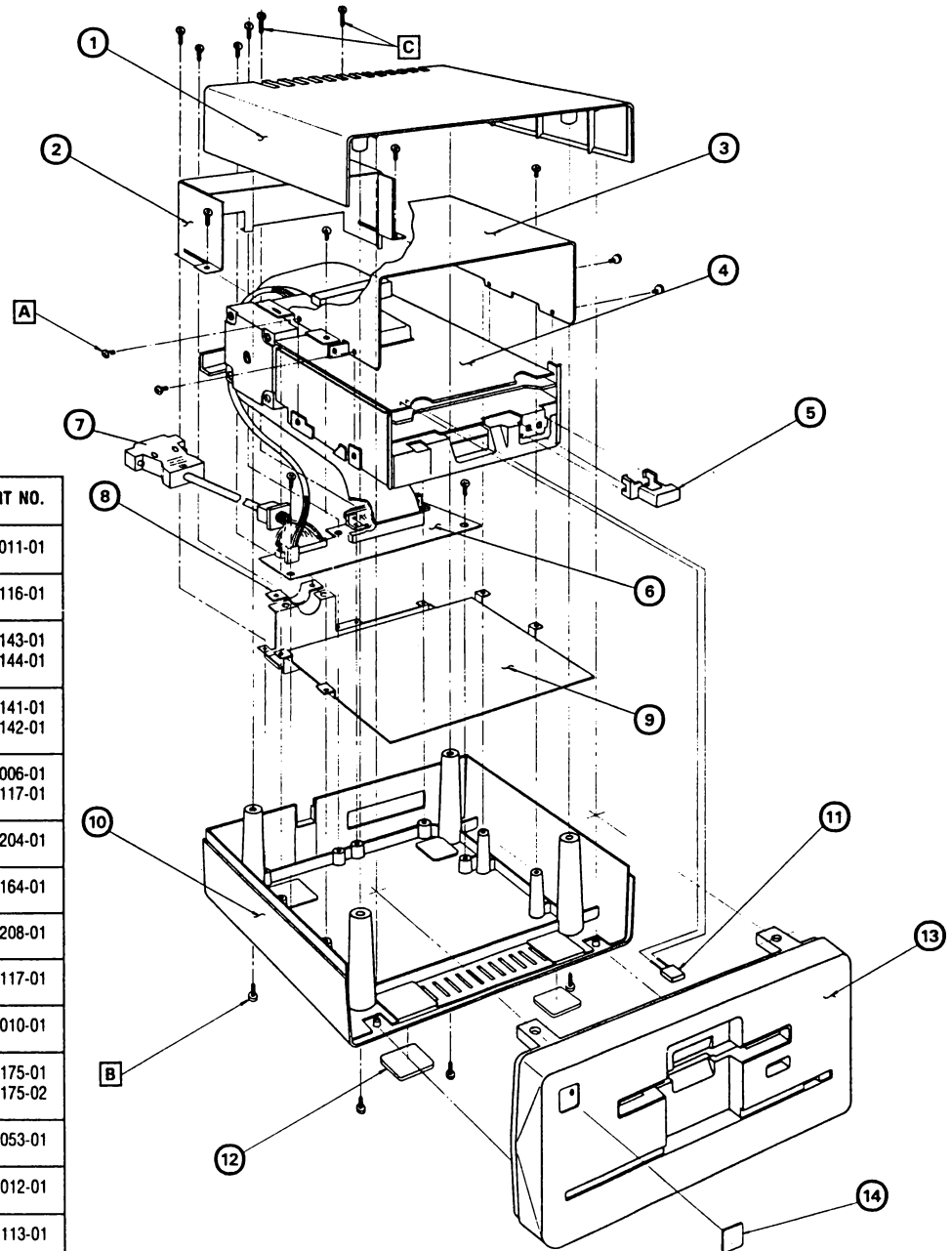


Fig. 2-1. Assembly Overview

THE MAJOR ASSEMBLIES IDENTIFIED

2.2 REAR CONNECTORS

2.2.1 Set the power switch of the AMIGA computer to the OFF position.

2.2.2 Disconnect the 3.5" external drive cable from the rear of the computer. See Fig. 2-2.

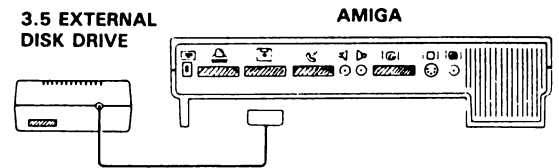


Fig. 2-2. Rear Connectors

2.3 OPENING THE CASE

2.3.1 Turn the external drive up-side down and remove the 4 screws from the hollows of the bottom housings. See Fig. 2-3.

2.3.2 Holding the case together, turn the drive right-side up with the front facing you.

2.3.3 Lift the top housing from the bottom housing.

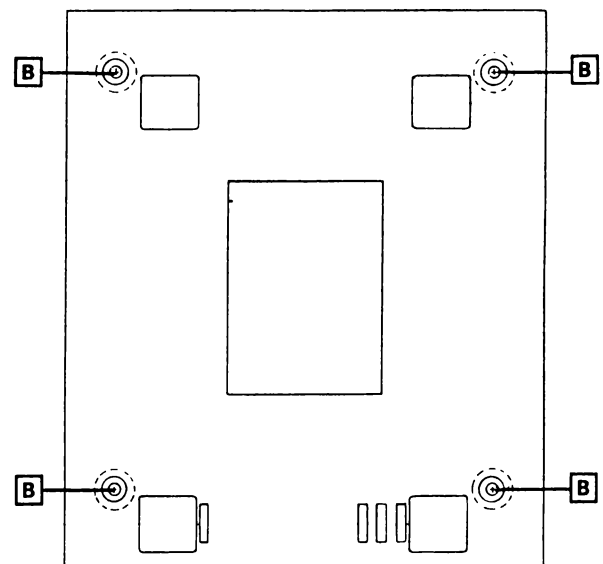


Fig. 2-3. Bottom View

NOTE: In the following step there is an LED wire connected to the front bezel. Care should be taken not to pull it tight when removing the panel.

2.3.4 With the top cover already off, the front BEZEL can be removed by gently working it forward, away from the bottom case. Lay the bezel in front of the drive, temporarily.

2.3.5 Disconnect the LED from the front bezel by gently releasing the LED clip. See Fig. 2-4.

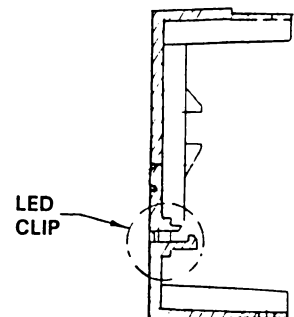


Fig. 2-4 Front Bezel Cutaway View

2.4 REMOVING THE TOP RFI SHIELD AND DRIVE BRACKET

2.4.1 As shown in Fig. 2-5, remove the following screws from the TOP SHIELD:

QTY	LOCATION
2	EACH SIDE OF SHIELD
6	ALONG REAR CONNECTORS

2.4.2 DO NOT ATTEMPT TO REMOVE THE SHIELD at this time. The sides of the shield are slotted (see Fig. 2-6.) and the drive bracket is engaged within them.

2.4.3 Remove the 4 screws from the sides of the drive bracket. See Fig. 2-7.

2.4.4 Lift the RFI shield and drive bracket (drive mechanism is still attached) from the base.

2.4.5 Slide the RFI shield toward the rear of the unit to disengage the bracket slots.

2.4.6 Remove the ribbon and power cables from the rear of the drive.

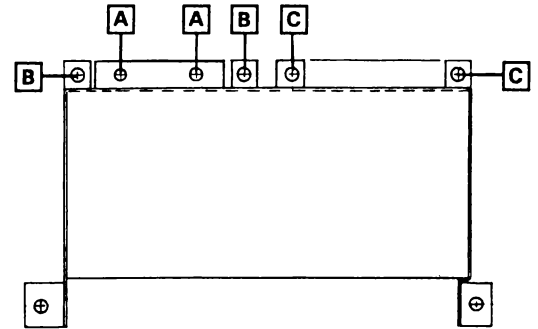
2.4.7 Lift the bracket, with the drive mechanism attached, from the bottom RFI shield and case.

FOR WARRANTY DRIVE ASSEMBLY EXCHANGE,
PLEASE RETURN THE ENTIRE ASSEMBLY INTACT.

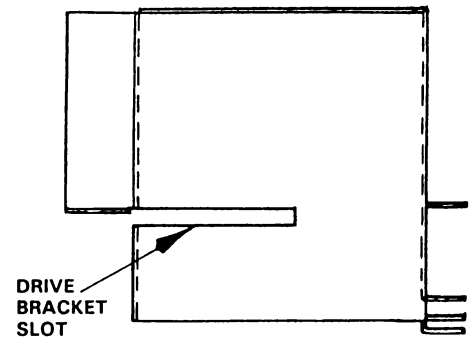
DRIVE ASSEMBLY: 327156-01 NEC
327156-02 PANASONIC

ASSEMBLY INCLUDES: Bracket
Drive Mechanism
Disk Eject Button
LED Assembly

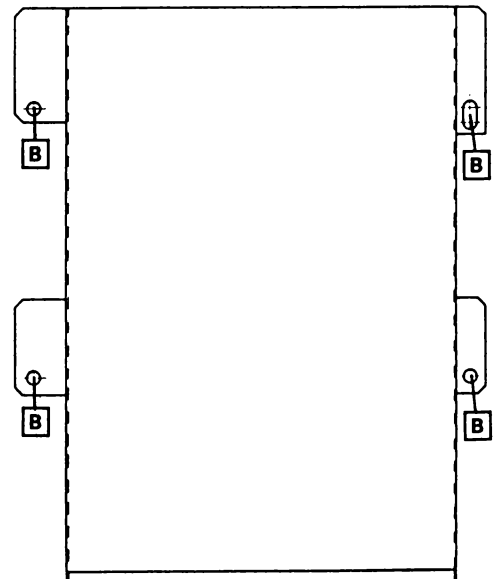
Please RETAIN the ribbon and power CABLES.



**Fig. 2-5. Top RFI Shield
Top View**



**Fig. 2-6. Top RFI Shield
Side View**



**Fig. 2-7. Drive Bracket
Top View**

2.4.8 If it is necessary to remove the drive mechanism from the drive bracket, remove the 4 screws from the sides of the bracket. See Fig. 2-8.

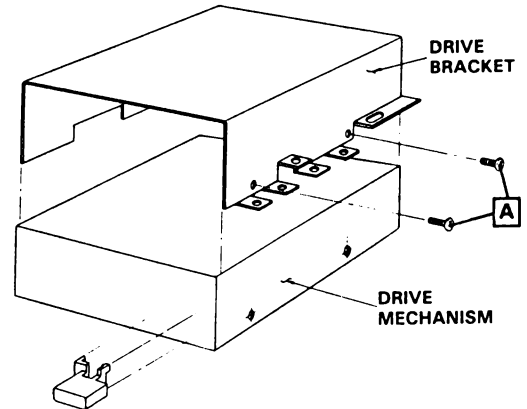


Fig. 2-8. Drive Assembly

2.5 REMOVING THE PCB ASSEMBLY

2.5.1 Remove the 2 screws from the PCB at the locations illustrated in Fig. 2-9.

2.5.2 Lift the PCB from the bottom RFI shield and case on an angle, to clear the rear case connector cutout.

WARRANTY EXCHANGE IS FOR THE PCB ASSEMBLY WITH THE INTERFACE CABLE ATTACHED.

Please RETAIN the ribbon and power CABLES.

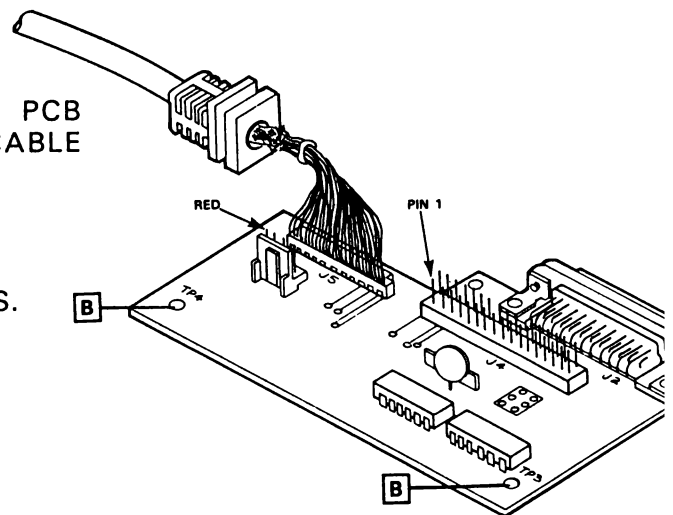


Fig. 2-9. PCB Assembly

SECTION 3. 3.5" EXTERNAL DRIVE ASSEMBLY

3.1 INSTALLING THE BOTTOM RFI SHIELD AND PCB ASSEMBLY

3.1.1 Place the BOTTOM RFI SHIELD in the bottom case, carefully aligning the holes with the corresponding holes in the casework.

3.1.2 Install the PCB and replace the 2 screws as shown in Fig. 3-1.

3.1.3 Place the CABLE CLAMP on the bracket of the bottom RFI shield as shown in Fig. 3-2. Slide the INTERFACE CABLE into the rear case slot.

3.1.4 Connect one end of the power cable to the PCB connector at J3. The cable is reversible but be sure to match the keyed connector properly.

3.1.5 Replace the ribbon cable on the PCB at connector J4, being careful to match the PIN 1 indicator of the cable to PIN 1 of the PCB connector. See Fig. 3-1.

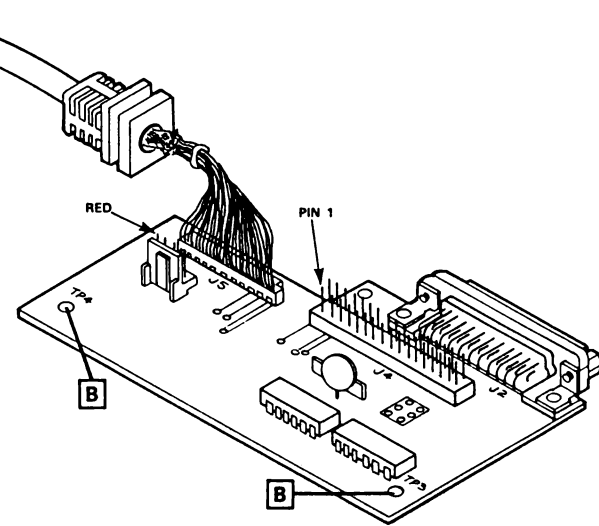


Fig. 3-1. PCB Assembly

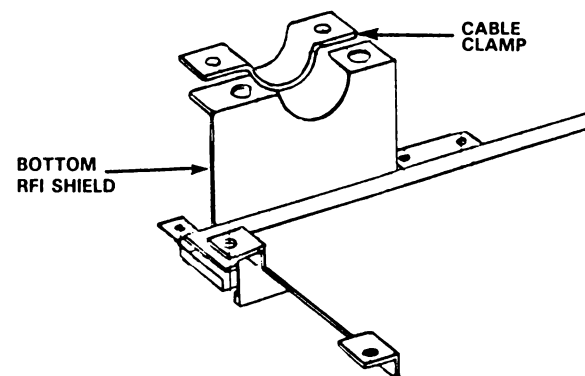


Fig. 3-2. Cable Clamp

3.2 DRIVE AND TOP SHIELD INSTALLATION

3.2.1 Ensure that the DRIVE ASSEMBLY is properly installed in the drive BRACKET with the 4 side screws. See Fig. 3-3. Check that the DISK EJECT BUTTON and LED ASSEMBLY are properly installed.

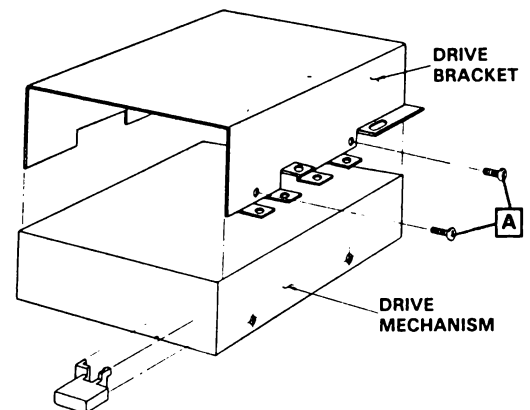


Fig. 3-3. Drive Assembly

3.2.2 Place the DRIVE ASSEMBLY over the bottom case and align the bracket holes with the bottom casework. DO NOT REPLACE BRACKET SCREWS AT THIS TIME.

3.2.3 Connect the ribbon and power CABLES to the drive mechanism.

NOTE: Care must be taken when installing the ribbon cable. The PIN 1 indicator must be connected properly for either the NEC or PANASONIC drive. See Fig. 3-4 and 3-5.

3.2.4 Lift the drive bracket enough to allow the slots in the TOP RFI SHIELD to slide onto the bracket. See Fig. 3-6.

3.2.5 Position the top shield so that the screw holes are in line with the bottom shield and case.

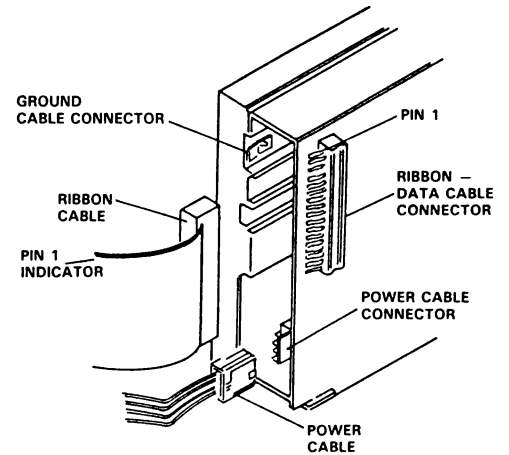


Fig. 3-4. NEC Drive

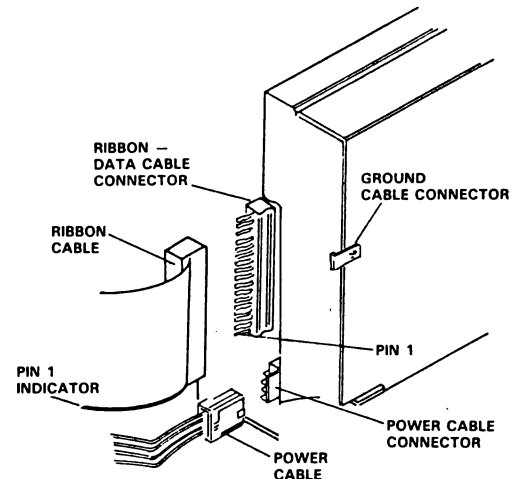


Fig. 3-5. PANASONIC Drive

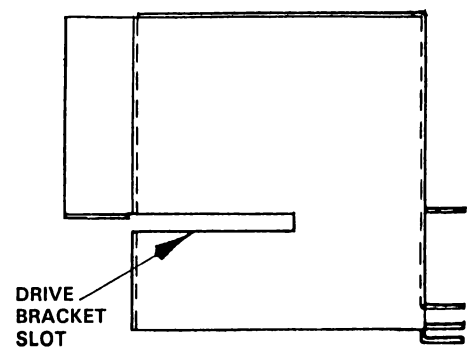


Fig. 3-6. Top RFI Shield Side View

3.2.6 Check that the cable clamp is still in position and install the 2 screws. See Fig. 3-7.

3.2.7 Install the remaining shield screws and the 4 drive bracket screws. See Fig. 3-7 and 3-8.

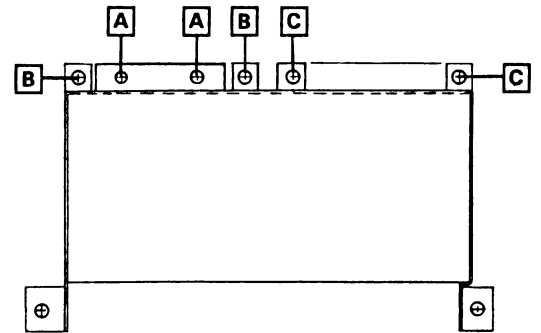


Fig. 3-7. Top RFI Shield Top View

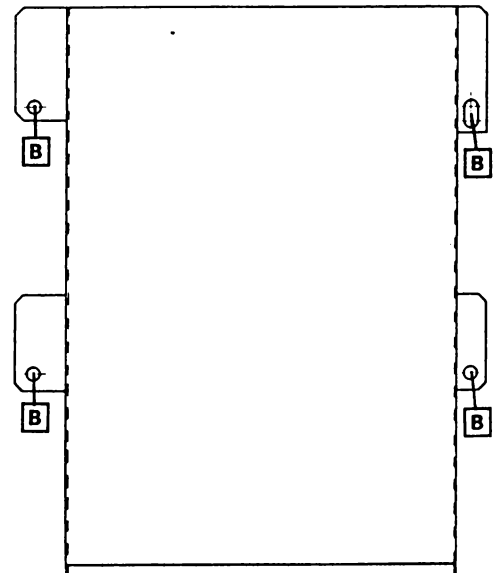


Fig. 3-8. Drive Bracket Top View

3.3 INSTALLING THE LED AND FRONT BEZEL

3.3.1 Lay the bezel in front of the drive. Insert the LED into the LED CLIP inside the bezel. See Fig. 3-9.

3.3.2 Match the bezel tabs with the bottom case posts, being sure to clear the disk eject button.

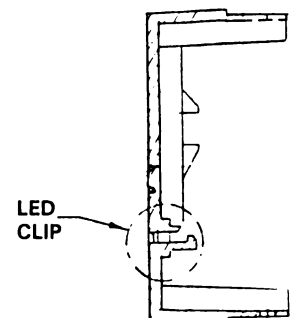


Fig. 3-9. Front Bezel Cutaway View

3.4 INSTALLING THE TOP CASE

3.4.1 Position the top case to align the posts with the bezel tabs.

3.4.2 Hold the top and bottom case parts together and invert the unit to the up-side-down position.

3.4.3 Replace the 4 case screws. See Fig. 3-10.

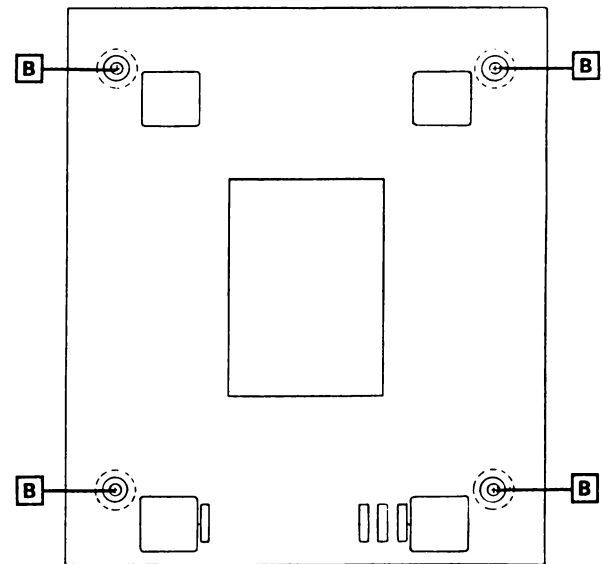


Fig. 3-10. Bottom View



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