

APPLE SCRIBE PRINTER TECHNICAL PROCEDURES

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Scribe Printer Technical Procedures

Section 1

Basics

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WHAT'S IN THIS SECTION

This section, Basics, gives you information about paper requirements, DIP switch settings, self-tests, and connector functions that can help you in troubleshooting and general use of the Apple® Scribe® Printer.

CONFIGURATION REQUIREMENTS

The Scribe printer uses the same interface cable as the Apple ImageWriter Printer.

In general, software drivers and filters for the ImageWriter will work for the Scribe, but certain features (such as boldface) will not be supported. Some software programs, such as AppleWorks™, require a customized driver program for the Scribe printer. (For more information, refer to the "Printers and Printing" chapter in the AppleWorks manual.) Customized print drivers for the Scribe will also offer optimized ribbon use in certain applications.

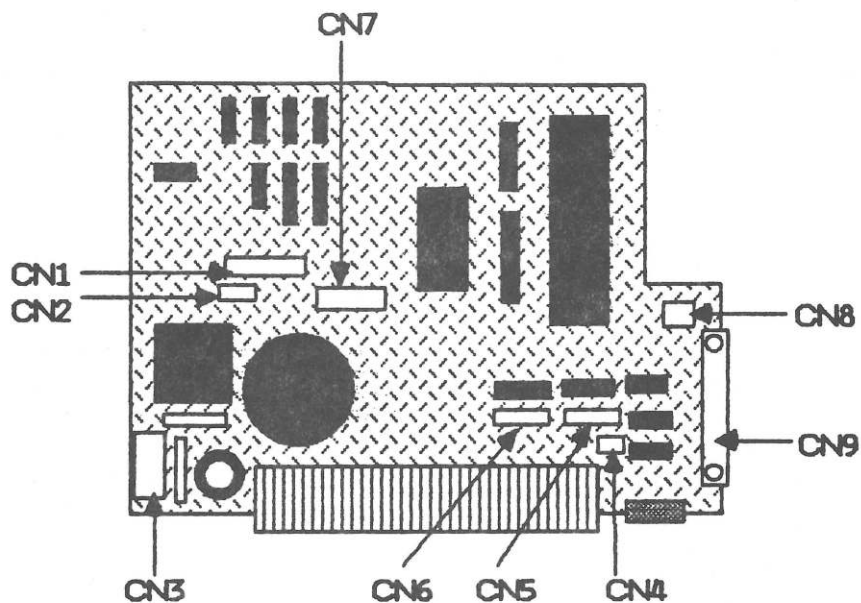
DIP SWITCH SETTINGS

The DIP switches are located on the back side of the printer, near the serial interface connector, concealed under a removable cover. The switch cover can be pried off with a small flatblade screwdriver, and the eight numbered switches can be pushed up or down by hand or with a small screwdriver. On the Self Test or Loopback Test, the DIP switch settings are printed out as 1's or 0's in reverse order (87654321), as shown here:

DIPSW(00*00000), '1=ON, 0=OFF'

A 0 indicates that the switch is in UP position (= OFF), a 1 indicates DOWN position (= ON). Switch 6 is always shown as an asterisk (*) rather than a 1 or 0, because it is an electrical switch rather than a firmware control. This does not mean that switch 6 is not functional: together with switch 5, it controls print intensity (see **Paper Requirements**, below).

A complete table of DIP switch functions and settings is found in the Scribe User's Manual, Part II: Reference, Appendix B.



Main Logic Board

Connector Functions

- CN1 - Out-of-Ribbon Sensor,
Print Head Solenoid
- CN2 - Out-of-Paper Sensor
- CN3 - Connects to transformer, power supply.
- CN4 - Carriage Motor resistor
- CN5 - Paper Feed Motor
- CN6 - Carriage Motor
- CN7 - Control Panel Lights and Switches,
Cover Interlock Switch
- CN8 - Left Margin (Home Position) Switch
- CN9 - Connector to Host Computer (I/O)

PAPER REQUIREMENTS

The Scribe printer is a **thermal transfer printer**: a heated print head, applied to a special ribbon, transfers the ink from the ribbon onto ordinary (non-thermal) paper. Alternatively, the Scribe can be used with thermal paper, with or without a ribbon. Using a ribbon along with thermal paper results in a very sharp black image.

The Scribe works best with smooth paper, 16- to 24-pound weight, such as that used for copying machines. Ordinary pin-feed paper is satisfactory, but coarser grades may cause light and uneven print quality. Print intensity can be adjusted using DIP switches 5 and 6 as follows.

	Switch	Position
For normal density:	5	Up
	6	Up
For low density:	5	Up
	6	Down

The Scribe can also be used effectively with transparencies. When printing on transparencies, use the following settings:

	Switch	Position
For normal density:	5	Down
	6	Up
For low density:	5	Down
	6	Down

In general, the Scribe works best with smooth bond paper. If a customer complains of print quality problems, the paper being used should be examined first. Always use the optimum bond paper when running tests.

MAIN LOGIC BOARD CONNECTOR FUNCTIONS

The diagram on the opposite page shows the functions controlled through the different cables connected to the Main Logic Board.

PRINTER SELF-TEST AND LOOPBACK TEST

As a general check of the Scribe printer, a level 1 technician should run the Loopback Test in preference to the Printer Self-test, because it includes a check of the data-sending and -receiving lines and circuits.

Printer Self-Test

The Printer Self-test allows the user to verify that the printer is operational. It prints out the ROM revision and DIP switch settings, and produces a print sample that can be used for print quality checks.

To run the Printer Self-test:

1. Make sure paper, ribbon, and top cover are installed.
2. Hold down the **line/form feed** button while turning the power on with the **power** button.

Loopback Test

The loopback test is identical to the self-test except that it also checks ROM, RAM, and data-sending and -receiving functions. Whenever you check a printer, run the loopback test to check operation and communications ability. (**NOTE:** The Loopback Test does not test the "handshaking" ability or setting (DTR or XON/XOFF) of the Scribe; the printer could pass the loopback test and still have faulty handshake circuits.)

To run the loopback test:

1. Make sure paper, ribbon, and top cover are installed.
2. Connect a loopback connector (a standard DB-25 connector with pins 2 and 3 jumpered) to the serial port on the printer.
3. Hold down the **letter** button while turning the power on with the **power** button.

If the printer passes the test, the words "LOOPBACK TEST" will be printed, followed by the ROM revision number, DIP switch settings, and character set printout.

If the printer fails the test, no printing will occur; the **select** lamp will flash either a RAM check or Loopback error pattern (see **Section 4, Troubleshooting**, for error lamp display patterns). This will also happen if you try to run the test without a loopback connector installed.

Disabling the Cover Interlock Switch

Like most printers, the Scribe contains a **cover interlock switch** that prevents it from functioning when the cover is removed. When you remove the printer cover (see **Section 2, Take Apart**), you will see the switch to the left of the **select** and **letter** switches. To run the Self-test or Loopback Test with the cover off, you can defeat the switch by wedging a piece of rolled-up paper or a similar non-metallic object in the switch opening.

Scribe Printer Technical Procedures

Section 2

Take-Apart

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IMPORTANT: There are two existing control panels for Scribe:

1. On the **original one-piece control panel**, the logic board cable is soldered to the panel, shielded with copper to pass RFI tests, and threaded through guides along the inside perimeter of the cover.
2. On the **newer two-piece control panel** there are two separate parts:
 - a. The control panel itself (connected to the cover), which has a short cable and connector soldered to it.
 - b. The logic board cable, which is mounted to the front of the mechanism assembly and runs underneath it to the logic board. When you exchange a mechanism assembly, this cable must be returned with the mechanism assembly module.

The take-apart procedures which follow are based on the original one-piece control panel configuration. For additional procedures specific to the newer two-piece control panel, see **Control Panel Upgrade** in this section.

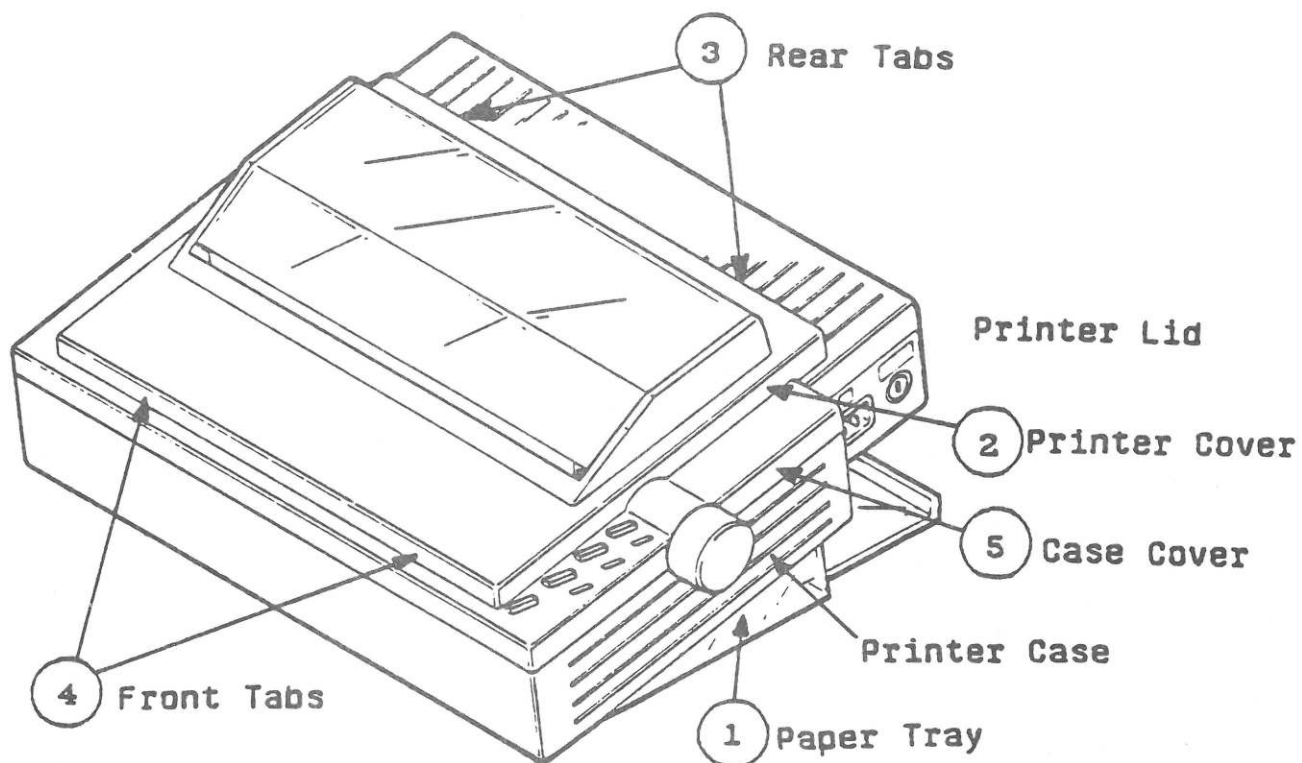


Figure 1

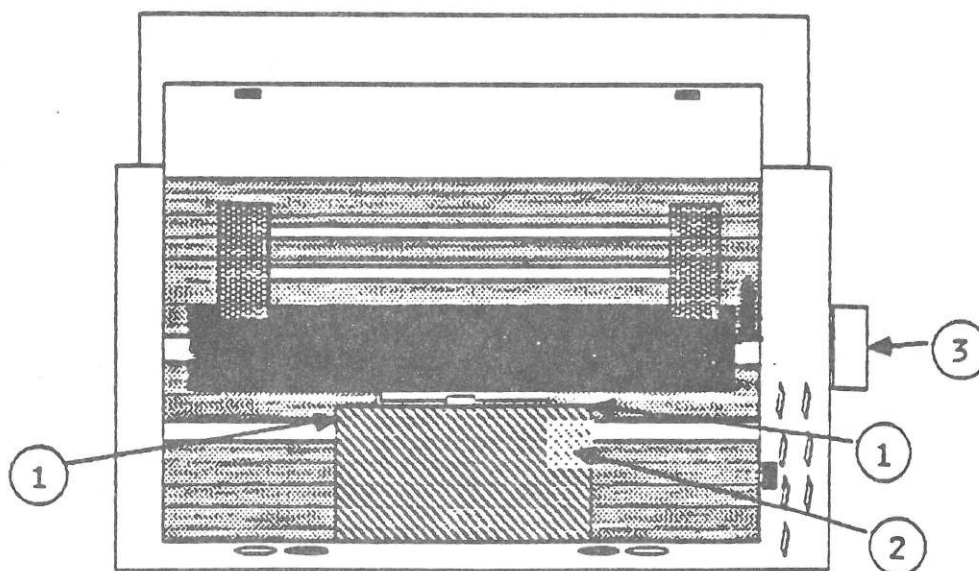


Figure 2

REMOVING THE PRINTER ASSEMBLY FROM THE CASE

Required Tools: medium Phillips screwdriver (magnetized)
small flatblade screwdriver
needlenose pliers
magnetic pick-up device or tweezers
foam workpad or equivalent
IC extractor (Apple P/N 918-0017)

Before you can perform any repairs or adjustments on the Scribe Printer, remove the printer assembly from the case according to the following instructions. **NOTE:** In all instructions that refer to "left" and "right," we assume that you are facing the front of the printer, where the Apple logo appears.

1. Turn off the power switch and remove the AC power cord from the printer.
2. Remove any paper from the printer, and lift the printer off the paper tray (Figure 1, #1) (if present).
3. Remove the translucent printer cover (Figure 1, #2) as follows:
 - a) Press forward on the back panel of the printer cover and lift it to free the two tabs in back (see Figure 1, #3).
 - b) Pull the cover slightly toward the back and up (to free the tabs in front - see Figure 1, #4).
4. Remove the ribbon cassette as follows:
 - a) Place your index fingers under the ribbon cassette, with one finger on each side, close to the platen (see Figure 2, #1).

CAUTION: The ribbon sensor is hidden under the cassette (see Figure 2, #2). Be sure that the finger on the right is under the **cassette** and not under the **ribbon sensor**.

- b) Lift up with your fingers until the cassette pops out. Then remove it from the printer.
5. Pull the platen knob (Figure 2, #3) off the platen shaft.
6. Remove the case cover (Figure 1, #5) as follows:

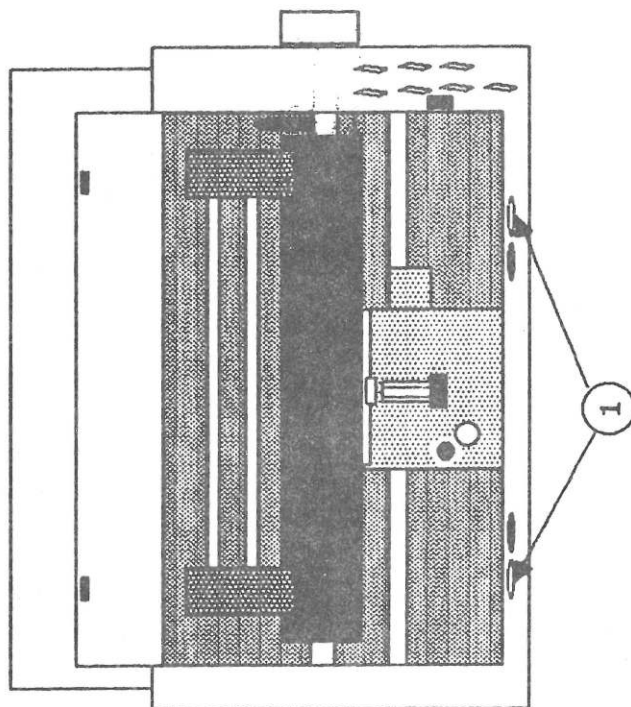


Figure 3

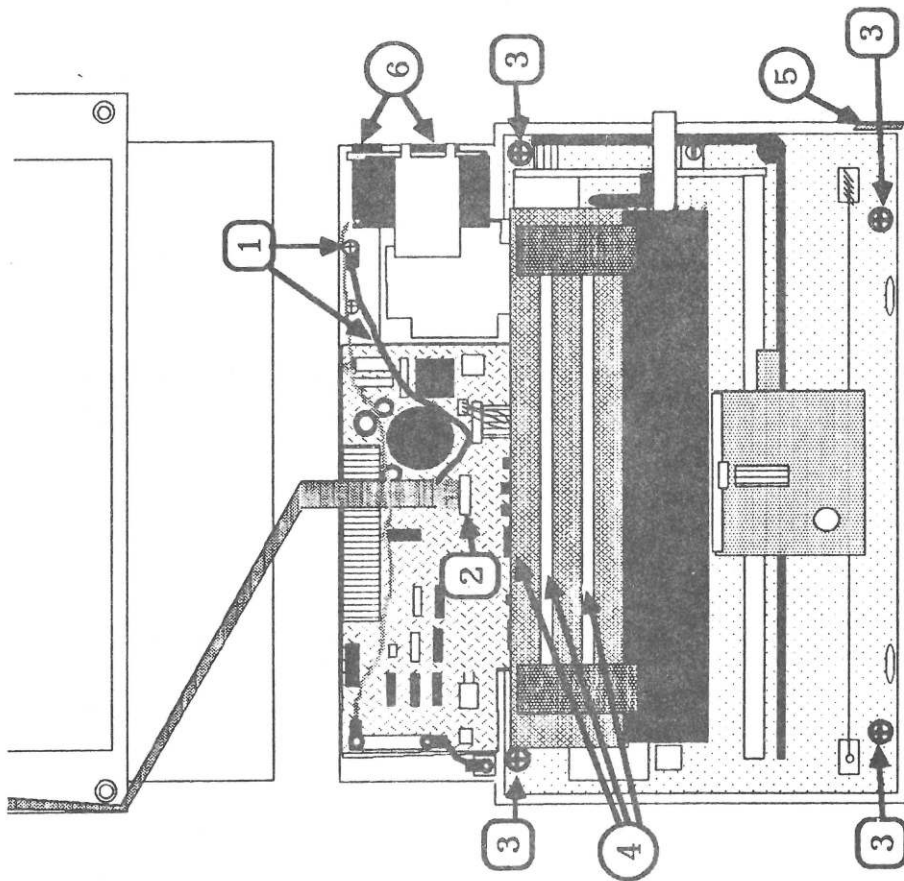


Figure 4

- a) Turn the printer over onto the workpad and remove the two screws on the bottom of the case.
 - b) Hold the case together and turn it right side up.
 - c) Free the ground wire from the right front corner of the baseplate by pushing on its connector with a screwdriver or needlenose pliers.
 - d) Locate the two tabs inside the front of the case (see Figure 3, #1). Notice the slots above the tabs on the inside of the front cover. To free the cover, push forward through the left slot with a small screwdriver while lifting up on the left corner of the printer cover. Repeat for the right tab.
 - e) Lift the front of the case cover up, pull the cover off its rear tabs, and lay it upside down behind the case; **DON'T STRAIN THE RIBBON CABLE** that connects the cover to the case.
 - f) Locate the ground wire that connects the ribbon cable to the rear of the chassis (Figure 4, #1). Free it from the chassis by removing the screw. **IMPORTANT:** Keep this screw with the ground wire. It is longer than the other chassis screws.
 - g) Disconnect the ribbon cable from the logic board **by pulling on the connector, not on the cable.** (See Figure 4, #2.)
 - h) Set the case cover aside.
7. Remove the four baseplate screws (Figure 4, #3).
8. Remove the printer assembly from the case as follows:
- a) Push the little grey cable-clamp out of the way (Figure 4, #5).
 - b) Grasp the assembly by the two metal rods and the back plate (Figure 4, #4) and lift it up, right side first, out of the case. (You may have to free the AC fuse holder and the power cord socket (Figure 4, #6) by prying outward on the case with a screwdriver or fingers as you begin lifting.)
 - c) Place the printer assembly on a stable work surface and set the case aside.

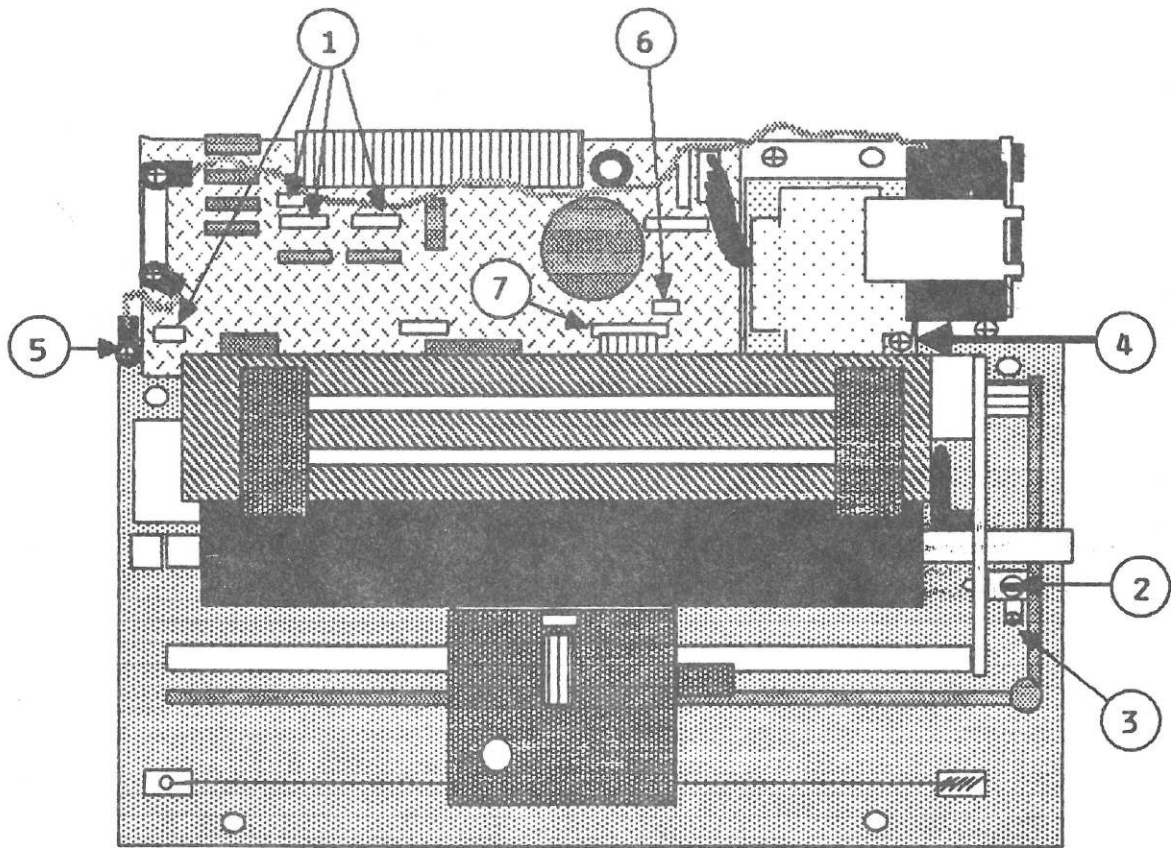


Figure 5

SEPARATING THE MECHANISM ASSEMBLY FROM THE LOGIC BOARD ASSEMBLY

1. Disconnect the cables from the four leftmost sockets on the logic board (Figure 5, #1). Remember to pull on the cable connectors, not on the wires.
2. Remove the power switch (Figure 5, #2) from the right side of the mechanism assembly as follows:
 - a) Remove the screw at the base of the power switch (Figure 5, #3).
 - b) If you push the switch to the right, you will notice that it is held to the mechanism by a twisted metal tab. Use needlenose pliers to straighten the tab, and then push the switch free.
 - c) Carefully disengage the switch wires from their three plastic clamps and rest the switch near the logic board. DO NOT STRAIN THE SWITCH WIRES.
3. Remove the screw just to the right of the transformer (Figure 5, #4).
4. Remove the small screw at the far left that connects the mechanism assembly to the electrical assembly (Figure 5, #5).
5. Separate the two assemblies slightly by sliding the logic board away from the mechanism assembly, about one inch. Don't strain the cables that still connect the two assemblies.
6. Disconnect the cable next to the flat mylar cable (Figure 5, #6).
7. Disconnect the flat mylar print head cable (Figure 5, #7) from the logic board as follows:
 - a) Using the IC extractor, pull up the ceramic cable-holder about 1/8 inch (Figure 5, #7) to release the cable. DO NOT FORCE IT; DO NOT PULL THE CONNECTOR OFF. Be careful not to damage the mylar cable.
 - b) Pull the mylar cable out of the cable-holder. IT SHOULD SLIDE OUT EASILY: if it resists, pull the cable-holder up further. DO NOT FORCE THE CABLE.
8. Slide the assemblies apart.

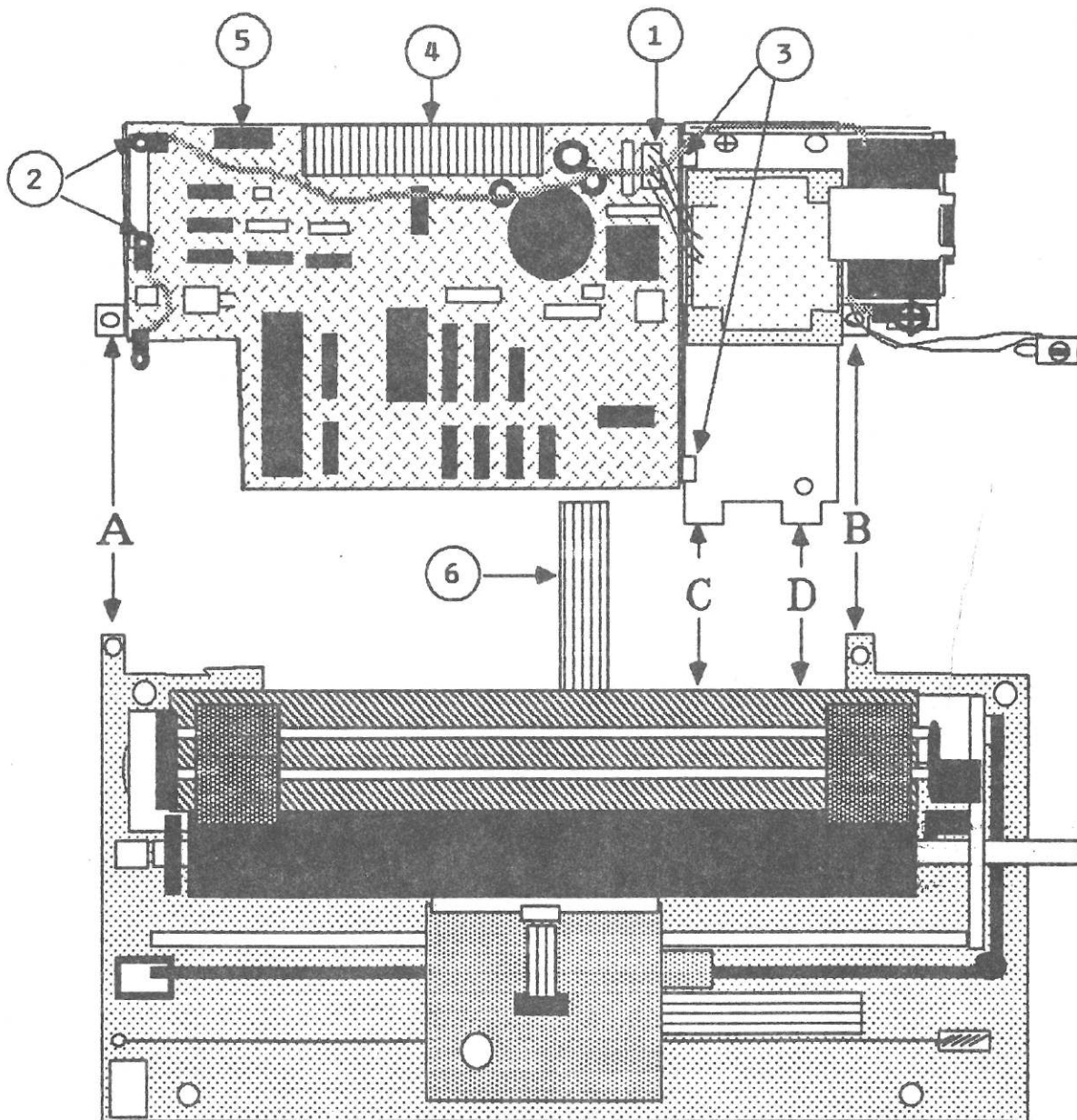


Figure 6

REMOVING AND REPLACING THE LOGIC BOARD

Remove

1. Disconnect the four-wire transformer plug from the logic board (Figure 6, #1).
2. Remove the two screws from the DB25 connector (Figure 6, #2) and set the ground wires aside.
3. Slide the logic board out from the small plastic clamps that hold it (Figure 6, #3), and set it aside.

Replace

1. Slide the new logic board into the plastic clamps.
2. Line up the holes at the sides of the DB-25 connector with the screw holes in the baseplate.
3. Insert and fasten the DB-25 connector's screws with the ground wires under them, as follows:
 - a) The long ground wire from the right goes to the rear of the DB-25; route it in front of the heat sink (Figure 6, #4) and the DIP switches (Figure 6, #5).
 - b) The short ground wire (which you removed) goes to the front of the DB-25.
4. Connect the four-wire transformer plug to its socket (Figure 6, #1).

CONNECTING THE LOGIC BOARD ASSEMBLY TO THE MECHANISM ASSEMBLY

1. Lay the Logic Board Assembly behind the Mechanical Assembly on a flat surface. (See Figure 6.)
2. Move all cables out of the way, so that none will be pinched or hidden when you push the assemblies together.
3. Make sure the mylar cable (Figure 6, #6) is lying on top of the logic board.
4. Slide the two assemblies together, making sure that Tabs A and B of the logic board lie under Tabs A and B of the mechanism assembly (see Figure 6).

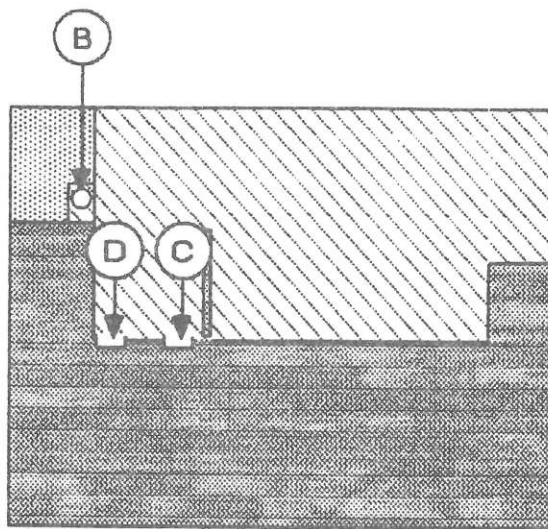


Figure 7

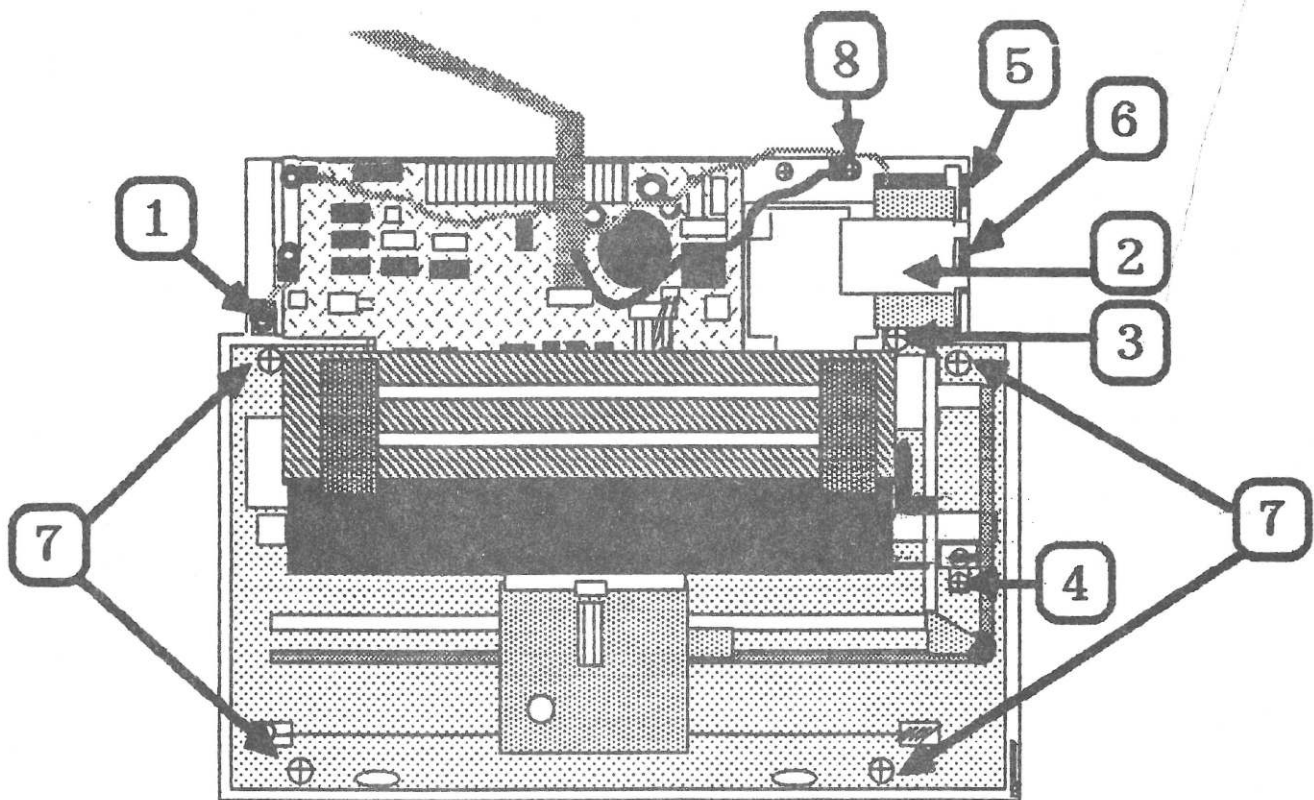


Figure 8

5. **IMPORTANT:** Lift up the two assemblies to make sure that tabs C and D on the logic assembly baseplate fit fully into slots C and D on the mechanism assembly baseplate (see Figure 7), and that tab B is correctly seated over its threaded hole. If the tabs are not correctly seated, repeat step 4.
6. Insert and tighten the small screw at the far left, with the short ground wire under it (Figure 8, #1).
7. Insert and tighten the screw next to the transformer (Figure 8, #3). You may have to move the noise filter and wires out of the way (Figure 8, #2 -- nothing is holding them down except friction).
8. Reconnect the mylar cable as follows:
 - a) Lift the ceramic cable-holder to full upward position (use fingers or IC extractor).
 - b) Hold the mylar cable as close to its end as possible, and insert it as far as it will go into the ceramic cable-holder.
 - c) Push down the ceramic cable-holder to lock the cable in position.
 - d) Gently tug on the mylar cable to test that it is held firm. If it moves, repeat steps a through c and test again.
9. Reconnect the five other cables (all except the ribbon cable) to the logic board. They are keyed by size and color so that you can see where they go.
10. Put the power switch back into place, reroute its wires under their three clamps, insert its tab into the proper slot, and refasten its screw (a small one) (see Figure 8, #4).
11. Retwist the tab on the power switch just enough to hold it.
12. Holding the printer assembly by the metal bars, lower it into the case, left side first, so that the DB25 connector slides into its slot first. (You may have to bend the front tabs out of the way to do this).
13. Make sure the AC fuse holder and the AC power cord socket (Figure 8, #5 and #6) fit into their slots in the case. If they don't, push them gently into place.

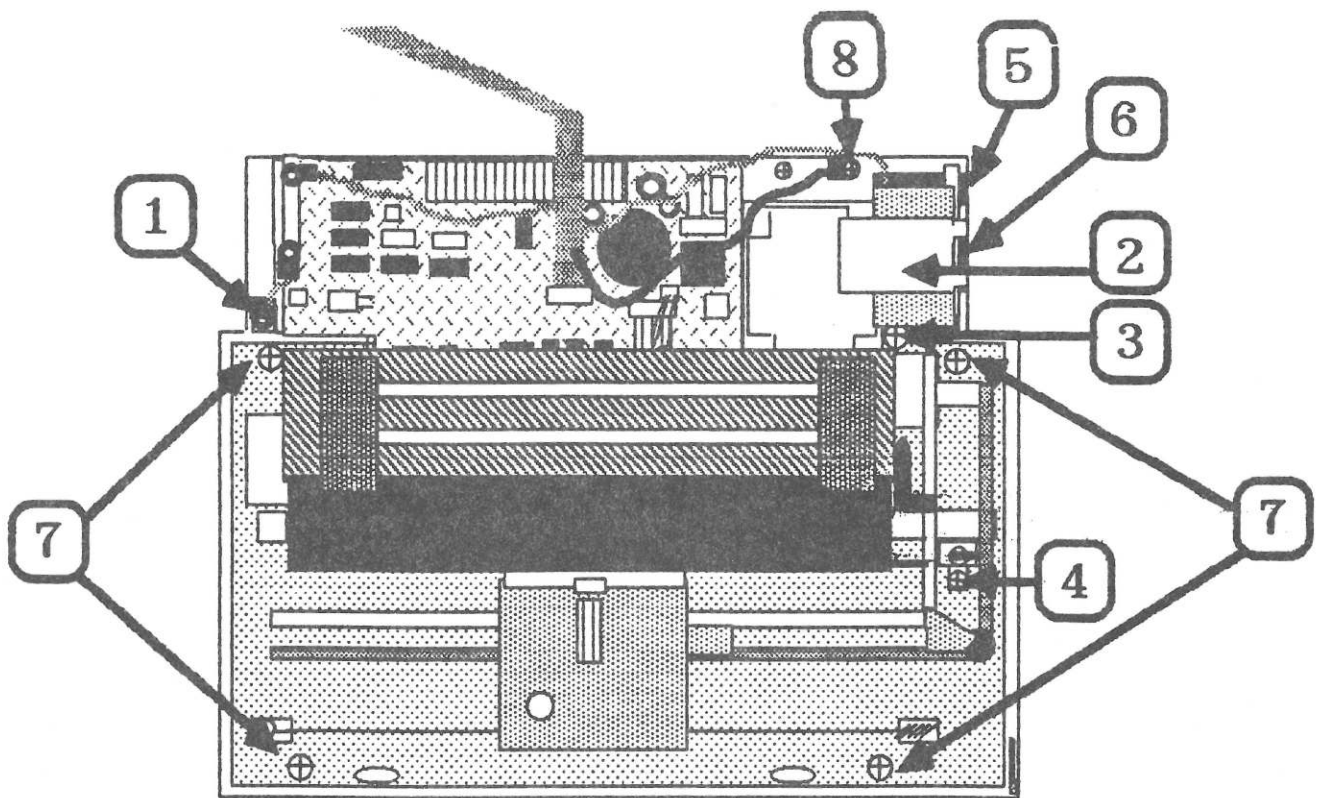


Figure 8

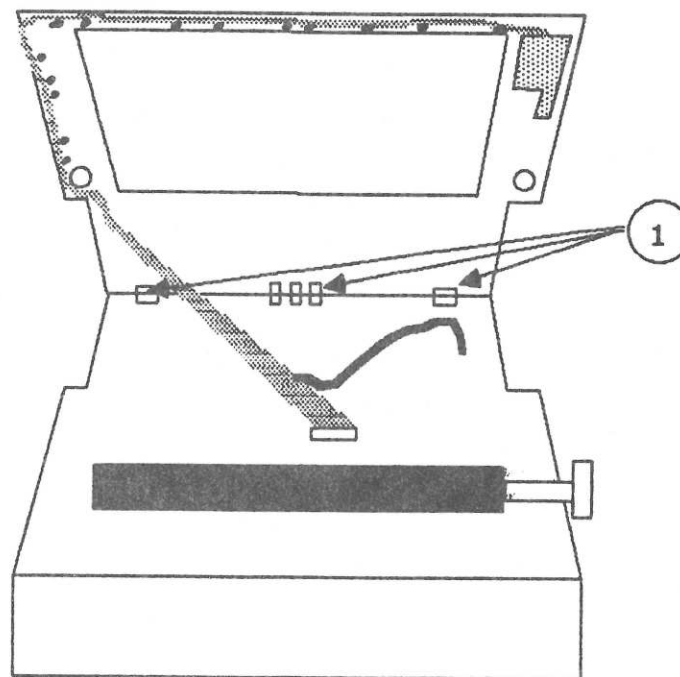


Figure 9

14. Replace and tighten the four screws at the corners of the black base-plate (Figure 8, #7). **NOTE:** These screws are all the same length. The similar but longer screw will be used later.

CAUTION: Be careful not to catch any wires under the screw at the left rear.
15. Make sure the ribbon cable in the case cover is seated behind the posts along the inner edge of the case cover. (See Figure 9.)
16. Plug the ribbon cable into the logic board.
17. Fasten the ribbon cable's ground wire to the right rear corner of the chassis with the long screw (Figure 8, #8).
18. Replace the case cover as follows:
 - a) Rest the back edge of the case cover on the back edge of the case, so that the tabs on the back edge of the cover are positioned properly (see Figure 9, #1).
 - b) Lower the front of the case cover so that the back tabs catch. Be careful not to pinch any loose cables between the case cover and the case.
 - c) Connect the ground wire at the right front of the baseplate and tuck it under the small grey clamp on the side of the case.
 - d) Push the front of the case cover onto the two front tabs until they click into place and hold it firmly. (You will have to push hard.)
 - e) Holding the case together, turn it upside down.
 - f) Replace the two screws in the bottom of the case.
 - g) Turn the case right side up.
19. Reinstall the platen knob.
20. Reinstall the ribbon cassette.
21. Reinstall the paper cover, front tabs first.
22. Place the printer on the paper tray.

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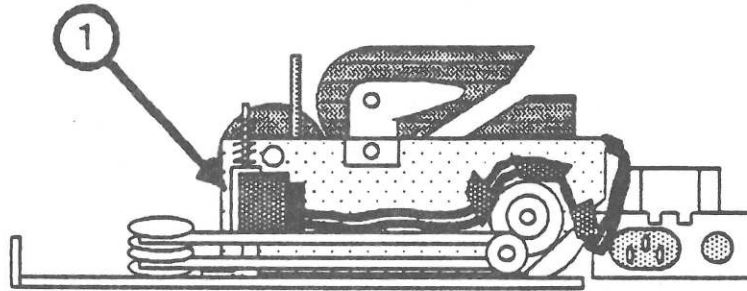
23. Install paper and run a self-test as follows:

- a) Make sure the power switch is in OFF position (up).
- b) Connect the power cord.
- c) Press the line/form feed switch and hold it down while pushing the power switch down. When the Scribe starts printing, release the line/form feed switch.

The self-test will run until you turn the power off.

If the self-test will not run, re-open the case and check to make sure that you have correctly reinstalled all cables.

If the printer still does not function correctly, refer to **Section 4, Troubleshooting**.



Right side of printer assembly

Figure 10

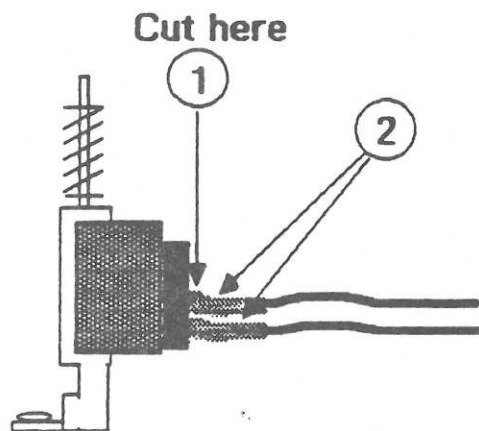


Figure 11

REPLACING THE POWER SWITCH

Recommended Tools:

Needlenose pliers	Soldering iron
Medium Phillips screwdriver	60/40 rosin-core solder
Diagonal cutters	Wire strippers
X-acto knife	Heat gun
Heat-shrink tubing (3/16 inch diameter)	

1. Remove the printer assembly from the case. (See procedure, above in this section.)
2. Remove the power switch (Figure 10, #1) from the right side of the printer assembly as follows:
 - a) Remove the screw at the base of the power switch.
 - b) If you push the switch to the right, you will notice that it is held to the printer by a twisted metal tab. Use needlenose pliers to straighten the tab, and then push the switch free.
 - c) Carefully disengage the switch wires from their three plastic clamps.
3. Cut the leads free from the faulty switch (see Figure 11, #1). **NOTE:** Cut the leads as close to the switch as possible.
4. Remove and discard the old shrink tubing (Figure 11, #2).
5. Strip about 3/8 inch of new wire on each lead.
6. Put a 3/4-inch length of new shrink tubing on each lead.
7. Attach the leads to the terminals of the new switch (either lead to either terminal) as follows:
 - a) Twist and tin a lead.
 - b) Insert the lead through the hole in either terminal.
 - c) Crimp the lead to ensure a good mechanical connection.
8. Solder the leads to the terminals.
9. Push the shrink tubing forward so that it covers the solder joint, and heat it with the heat gun until it shrinks to a snug fit around the joint.

10. Reroute the leads under the three plastic clamps and put the new switch in place.
11. Reinstall the screw at the base of the switch, put the tab through its slot in the side plate, and put a slight twist in the tab to hold the switch in place.
12. Reassemble the printer and run the Loopback test to check the repair.

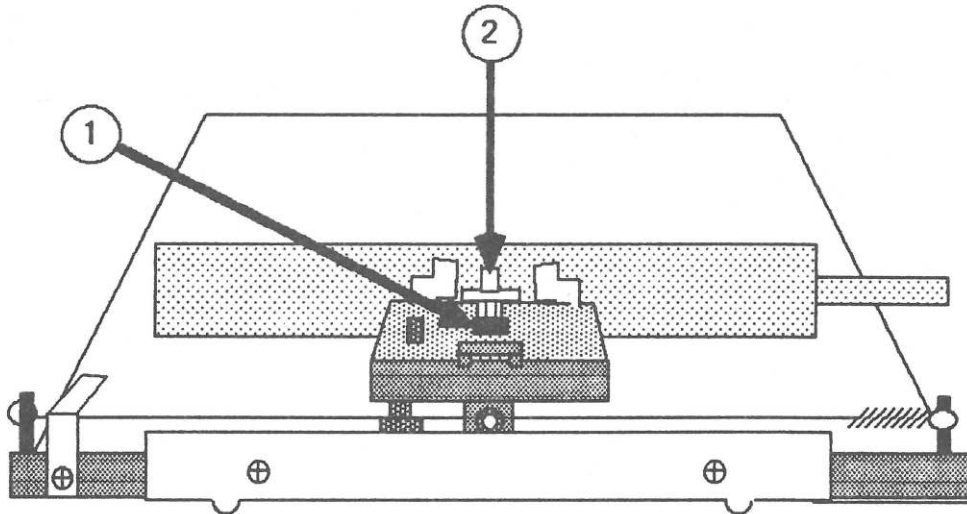


FIGURE 12

REMOVING AND REPLACING THE PRINT HEAD

Remove

1. Turn the power on to center the print head, then turn the power back off.
2. Follow steps 1 through 6 of "REMOVING THE PRINTER ASSEMBLY."
3. Grasp the print head connector (Figure 12, #1) by the sides and progressively pull up to disconnect it. Rocking the connector back and forth as you lift will make it easier to remove.
4. Grasp the print head (Figure 12, #2) by the sides and pull up to disconnect it.
5. Remove the rubber cap from the top of the print head connector. Put the cap in a safe place -- you will have to install it over the new print head's connector.

Replace

1. Install the rubber cap from the old print head connector over the new one.
2. Holding the print head by the sides, lower it into the grooves located at the front of the ribbon cassette holder. (See Figure 12.)
3. Carefully reconnect the print head connector to the circuit board connector at the center of the ribbon cassette holder. (See Figure 12, #2.)
4. Follow steps 18 through 22 of "CONNECTING THE LOGIC BOARD ASSEMBLY TO THE MECHANISM ASSEMBLY." (See page 2.13.)
5. Perform a Self Test to make sure that the Scribe is functioning properly. (See Section 4, Troubleshooting.)

CONTROL PANEL UPGRADE

As noted at the beginning of this section, there are two existing control panels for Scribe. In the one-piece control panel (original) version, the cable is soldered to the control panel, shielded with copper to pass RFI tests, and threaded through guides around the inside perimeter of the cover.

In the newer control panel version, the cable is separate from the control panel. It is mounted instead to the front of the mechanism assembly and runs underneath it to the logic board. This cable is attached to the mechanism assembly with double-sided tape. **When you exchange a mechanism assembly this cable must be returned with the mechanism assembly module.**

New (purchased from stock) or exchange mechanism assemblies will have the cable attached or the Upgrade Assembly will be included. If the Upgrade Assembly is included, then install it on the mechanism assembly. The Upgrade Assembly contains the cable and a nut, bolt, and clip to hold the cable in place on the mechanism assembly.

There are two possible situations which involve the Upgrade Assembly when the mechanism assembly is exchanged:

1. If the customer's printer has the original control panel installed, ignore the cable installed under the exchange mechanism assembly (but make sure it is disconnected from the logic board). Connect the original control panel cable to the logic board.
2. If the customer's printer has the new control panel installed, simply connect the new control panel to the cable mounted on the mechanism assembly and connect the other end of the cable running underneath the mechanism to the logic board.

NOTE: Be sure to install the Upgrade Assembly on the mechanism assembly. Both are included in the Spares Kit.

Scribe Printer Technical Procedures

Section 2: Take-Apart

Appendix A: Optional Procedures

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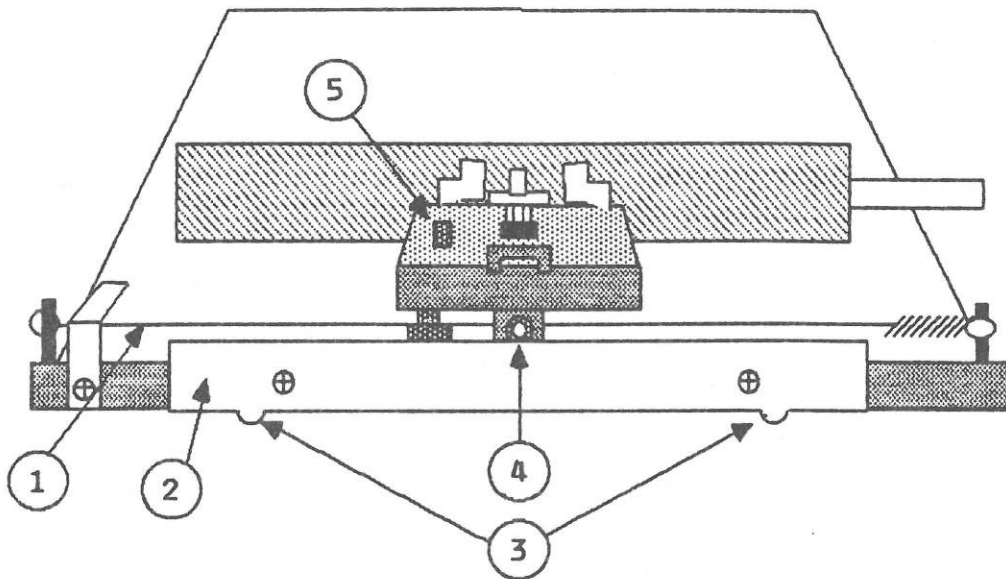


Figure 1

REPLACING THE RIBBON DRIVE WIRE

Required Tools: medium Phillips screwdriver

NOTE: This procedure is optional at Level 1.

The ribbon drive wire (Figure 1, #1) is a thin, clear nylon filament, like fishing line, that turns a pulley to advance the ribbon as the carriage moves. If it breaks or becomes otherwise unusable, replace it as follows.

To Remove:

1. Remove the printer assembly from the case (see Take-Apart procedures).
2. Remove the front guide bar (Figure 1, #2) from the mechanism assembly by removing its two screws.

IMPORTANT: Before removing the ribbon drive wire, note how it is routed around the ribbon drive pulley underneath the carriage assembly.

3. Grasp the spring at the right of the ribbon drive wire and remove it from its post.
4. Remove the spring from the wire.
5. Remove the wire from the pulley.
6. Remove the left side of the wire from its post.

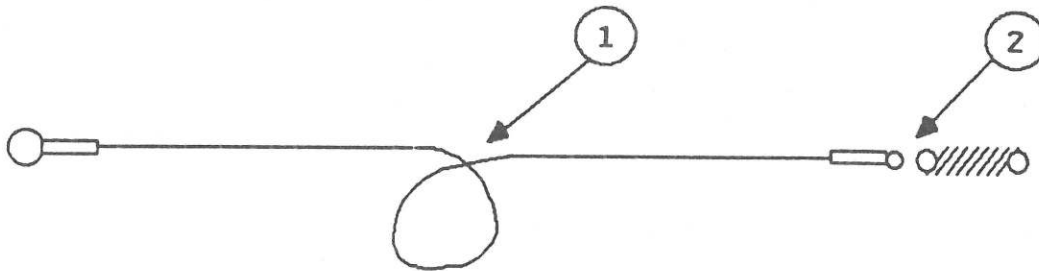


Figure 2

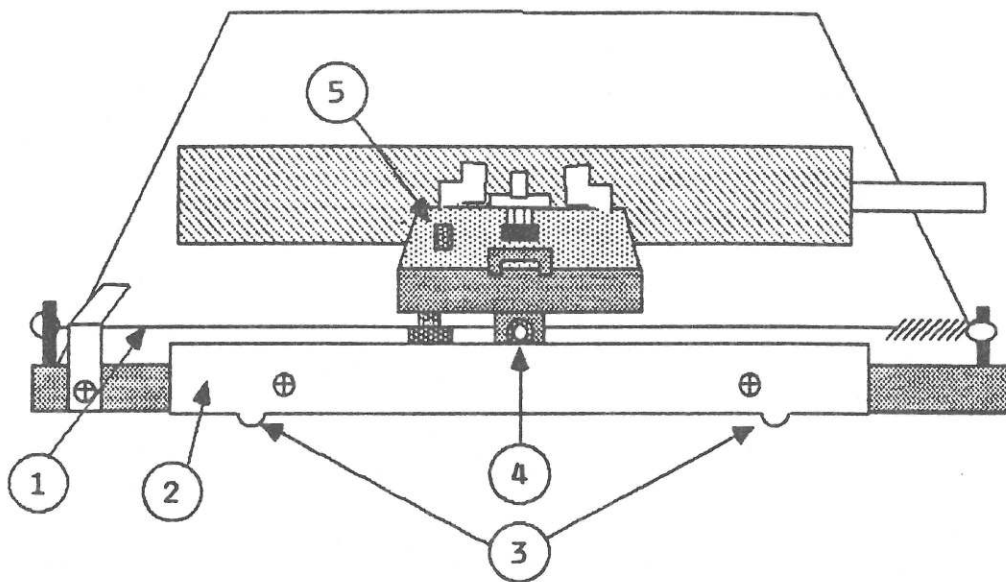


Figure 1

To Replace:

1. Hook the large end-loop on the wire around the left post. Make sure the end-loop fits into the slots on the post.
2. Make a loop in the wire (see Figure 2) and fit it around the ribbon drive pulley beneath the carriage assembly. Make sure the crossover in the loop (Figure 2, #1) is at the rear of the pulley.
3. Pull the wire taut, so that it stays in place around the pulley.
4. Hook the **smaller** end-loop of the new wire through one hook of the spring. (See Figure 2, #2.)
5. Hook the spring to the right-hand post. Make sure the spring fits into the groove in the post.
6. Make sure the wire and spring look straight on both sides. If not, adjust them.
7. Replace the front guide bar as follows:
 - a) Rest the front roller of the carriage assembly on top of the front guide bar. (See Figure 1, #4.)
 - b) Line up the tabs on the guide bar (Figure 1, #3) with the tabs on the baseplate of the mechanism assembly.
 - c) Replace and tighten the two screws in the front guide bar.
8. To check that the installation was correct, press the print head against the platen with your finger while you move the carriage assembly across its track. The ribbon drive capstan (Figure 1, #5) should turn as the carriage moves from left to right. If it doesn't, readjust the wire.
9. Replace the printer assembly in the case (see procedure above).

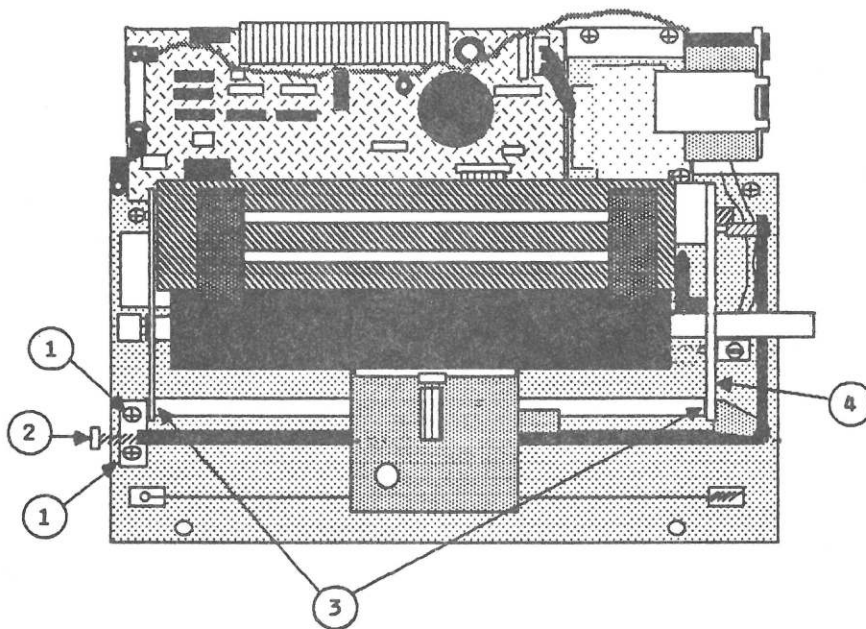


Figure 3

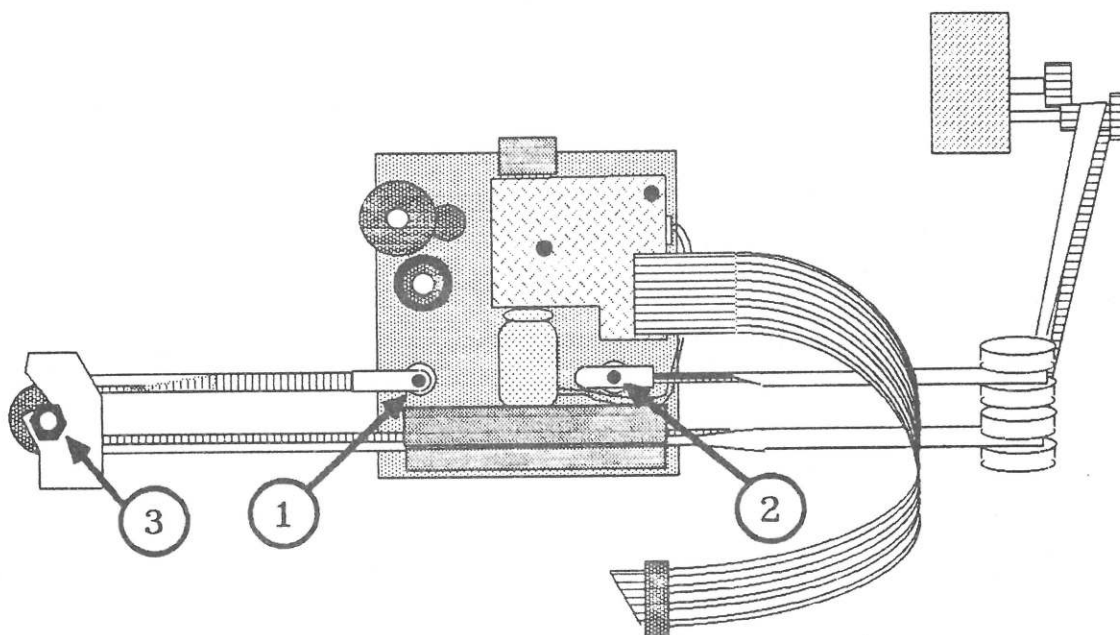


Figure 4

REPLACING THE DRIVE BELT

Required Tools: Medium Phillips screwdriver
5.5 mm nut driver or wrench, or
small adjustable wrench

NOTE: This procedure is optional at Level 1. In any case, it should only be necessary if the belt is cut or otherwise damaged.

1. Remove the printer assembly from the case.
2. Loosen the drive belt as follows:
 - a) Loosen the two screws that hold down the belt tension bracket (Figure 3, #1).
 - b) Loosen the belt tension screw (Figure 3, #2) as far as possible without removing it.
3. Remove the front guide bar and ribbon drive wire (see **Replacing the Ribbon Drive Wire**, above.)
4. Remove the screws from the ends of the carriage shaft (Figure 3, #3).
5. Move the carriage assembly all the way to the left.
6. Lift the right end of the carriage shaft out of its socket. (You will have to push outward on the side plate. See Figure 3, #4.)
7. Slide the carriage shaft out from the carriage assembly and completely out of the machine.
8. Slide the carriage assembly to the middle of its track.
9. Remove the two clear plastic paper guides and the print head. (To remove them, pull up with a wiggling motion.)
10. Lift the near edge of the carriage assembly up and rest the assembly on its print-head side, so that its underside is facing you. (See Figure 4 for a view of the underside of the carriage assembly.)
11. Remove the screws from the two ends of the belt (Figure 4, #1 and 2).
12. Loosen the nut on the left-hand belt pulley (Figure 4, #3); then pull the pulley out of its holder and remove the belt. **IMPORTANT:** Be careful not to lose the pulley's washers.

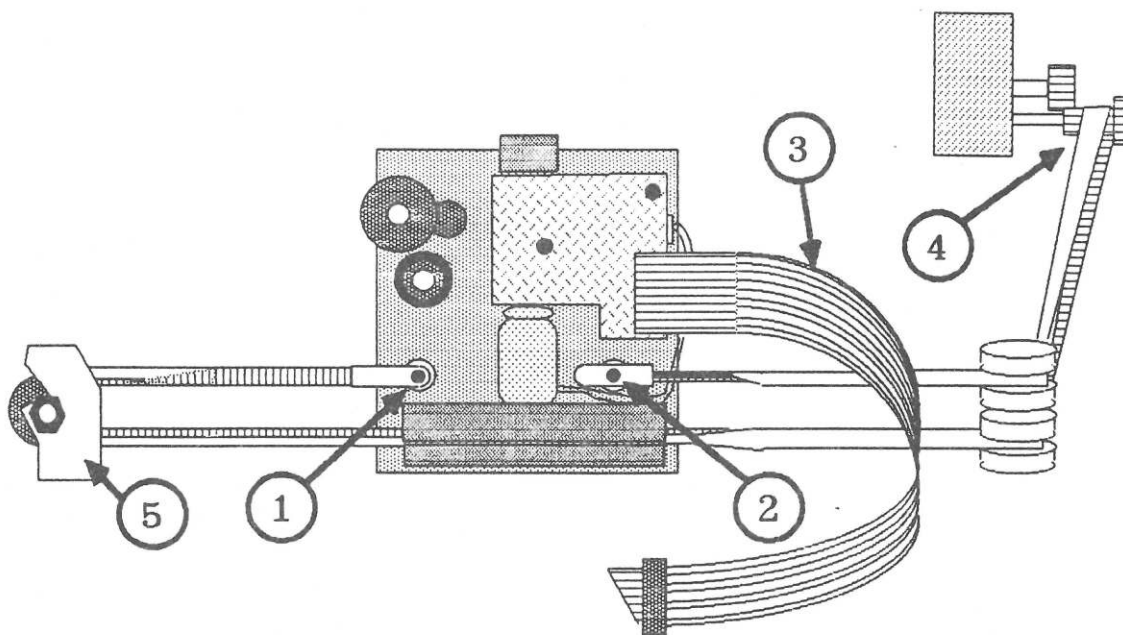


Figure 5

Installing the New Belt

1. Attach either end-piece of the new drive belt to the right-hand mounting hole in the carriage assembly (Figure 5, #2) as follows:
 - a) Hold the belt so that the smooth side faces up.
 - b) Align the hole near the **midpoint** of the belt end-piece with the right-hand mounting hole in the carriage assembly (see Figure 5, #2).
 - c) Insert and tighten the screw, being careful not to pinch any wires.
2. Route the belt as in Figure 5:
 - behind the wide plastic cable (Figure 5, #3);
 - over the upper pulley on the right side (give the belt one 90° turn so that the ridges on the belt engage the ridges on the pulley);
 - around the carriage drive pulley (Figure 5, #4);
 - back over the lower right-hand pulley;
 - under the carriage assembly (with ridged side up);
 - and through the left hand pulley bracket (Figure 5, #5) (from which you removed the pulley).
3. Replace the left-hand pulley in its slot. The small washers on each side go **inside** the slot. The large washer goes on the outside at the front, under the nut.

IMPORTANT: Do not overtighten the nut. If you do, it may cause a home position error.
4. Route the loose end of the belt around the pulley, and line up the end-piece of the belt with the left hand mounting hole on the carriage assembly (see Figure 5, #1). (You will have to turn the belt 90° so that the ridges on the belt face toward you and the hole at the **end** of the end-piece lines up with the mounting hole.)
5. Attach the end-piece to the carriage assembly.
6. Turn the carriage assembly right side up and move it all the way to the left.

7. Put the carriage shaft back through the carriage assembly. (The small rubber bumper goes to the right side.)
8. Fit the carriage shaft into its sockets and replace the two screws that hold it in place.
9. Replace the ribbon drive wire and front guide bar (see above).
10. Replace the print head (including the rubber cap on its connector) and the plastic paper guides.
11. Adjust the drive belt tension (see **Section 3, Adjustments**).
12. Move the carriage assembly back and forth along its track, observing to make sure that it is correctly installed.

DRIVE BELT TENSION ADJUSTMENT

Required Tools: spring gauge (P/N 077-0014 or equivalent)
Metric ruler
5.5 mm nutdriver or wrench,
or small adjustable wrench
Medium Phillips screwdriver

The Scribe Printer often produces a small **horizontal registration** error (a slight unevenness line-to-line) at column 0 (the left margin). This unevenness is difficult to remove and should be considered normal. Horizontal registration errors (uneven vertical lines) elsewhere on the page are not acceptable and are correctable by adjusting the belt tension.

Faulty drive belt tension can also cause **home position** errors (see Section 4, **Troubleshooting**, p.4.6-4.8 for error indications). In the case of a home position error, make sure that the home position sensor switch (Figure 1, #1) is firmly attached to the chassis before you try the belt tension adjustment. If there is any play in the sensor switch mounting, tighten the screw. This may solve the problem without belt tension adjustment.

To Measure Belt Tension:

1. Remove power from the printer and disconnect the power cord.
2. Remove the printer cover.
3. Move the carriage assembly all the way to the right.
4. Position the spring gauge on the top portion of the drive belt, halfway between the carriage assembly and the left-hand belt pulley. (See Figure 1, #2.)
5. Press down on the drive belt with the gauge until the top of the belt is 10 millimeters (about 3/8 inch) from the bottom plate of the printer (see Figure 2). The spring gauge should read between 1/4 and 1/2 pound (175 g, + or - 25 g).
6. If the spring gauge reading is outside that range, tighten or loosen the belt according to the steps below.

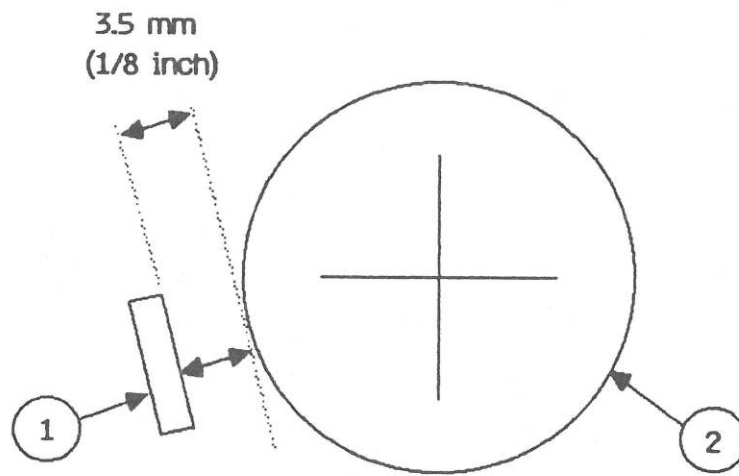


Figure 5

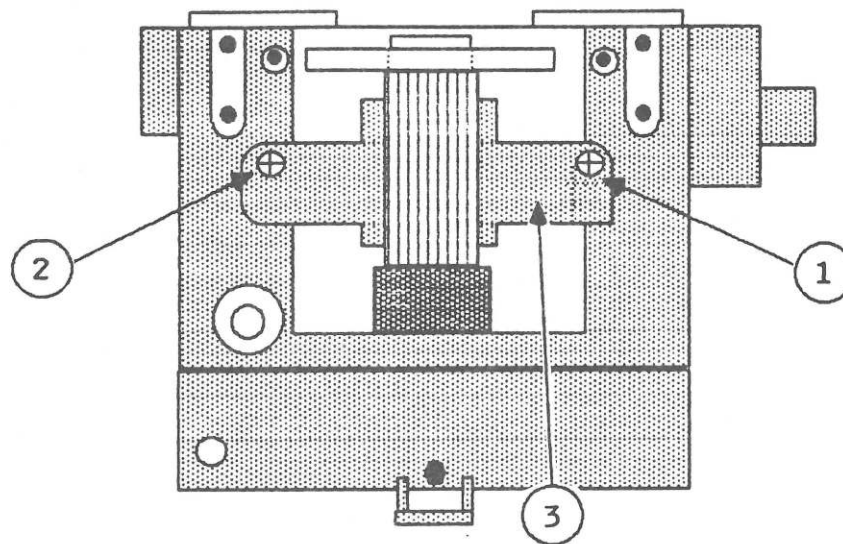


Figure 6

PRINT HEAD ADJUSTMENT

If the print head is too far from the platen, printing will be uniformly light. If it is too close, printing may be too black and overlaid with a grey smear.

Measuring the print head gap

1. Remove the ribbon cassette from the printer.
2. Remove the clear plastic paper guide from the left-hand side of the carriage assembly (it pulls off).
3. Measure the distance between the print head (Figure 5, #1) and the platen (Figure 5, #2). The gap should be 3.5 mm, + or - 0.5 mm (about 1/8 inch).

Adjusting the print head gap

1. Remove the ribbon cassette from the printer.
2. Loosen but do not remove the adjustment screw on the right (Figure 6, #1).
3. Loosen the left-hand screw (Figure 6, #2) just enough to allow movement of the print head positioning plate (Figure 6, #3). (It pivots at the left side and moves at the right.)
4. Move the print head forward or back until the gap is correct (3.5 mm or 1/8 inch).
5. Tighten the screws.
6. Measure again to verify adjustment. Read just if necessary.
7. Run the self-test to verify that the adjustment has solved the problem. Read just if necessary.
8. Make sure to reinstall the clear plastic paper guide when you finish.

Scribe Printer Technical Procedures

Section 4

Troubleshooting

Contents:

Initial Checks.....	4.3
Self-Test.....	4.5
Instructions for Using the SYMPTOM TABLES.....	4.5
Symptom Tables (Error Conditions).....	4.7
Symptom Tables (Print Quality Problems).....	4.9
Symptom Tables (Abnormal Printer Operation).....	4.11

NOTE: The Scribe printer should be tested the Apple II
Peripherals Diskette. (See **Multi-Product Diagnostics**
Technical Procedures, Section 1.)

To troubleshoot the SCRIBE printer, first perform the Initial Checks below; then if the problem is not found, try running the self-test and use the SYMPTOM TABLES to diagnose the problem. All repairs must be verified by passing the self-test.

INITIAL CHECKS

Inspect everything visually, including:

_____ Power Cord (if available)	insulation cracks evidence of burning misformed from excessive bending ground plug missing from power cord
_____ Printer Case	burn marks case has been opened by user evidence of having been dropped (cracks in case, paper tray, or cover)
_____ Ribbon Cassette	no ribbon installed out of ribbon ribbon torn ribbon drive cable broken
_____ Print Head	print head appears damaged print head cable incorrectly installed
_____ Platen	platen dirty or damaged labels stuck on platen paper or labels stuck in feed path

SELF-TEST

1. Make sure paper is installed; press and hold down the LINE/FORM FEED key on the control panel and then turn the power on. The printer should print a repetitive alpha-numeric pattern.
2. If the self-test does not pass or if the print quality is poor, note the symptoms and go to the SYMPTOM TABLES

INSTRUCTIONS FOR USING THE SYMPTOM TABLES

Equipment Required: Phillips screwdriver
 flatblade screwdriver
 needlenose pliers
 ruler
 loopback connector
 IC extractor (Apple PN# 918-0017)
 Tension gauge (Apple PN# 077-0014)

Procedures:

1. Locate the symptom in the tables that most nearly matches the observed symptoms of the printer being repaired.
2. Perform the corrective actions, in the sequence listed, until the failure has been diagnosed and repaired. If the problem is not found using the corrective actions given, locate another symptom that is similar, and follow the corrective actions for that symptom.
3. If the symptoms you observe are not found in the tables, replace the logic board (it can cause the greatest variety of symptoms).

NOTE: The word "check", as used in the tables, means to visually inspect and/or manually test for loose connections, burned components, mechanical binding, breaks or tears, looseness or tightness, etc.

When the tables say to "replace" a module, be sure to return the original module to the system if the replacement did not repair the problem. Do this before you replace another module. The tables are given in the following pages.

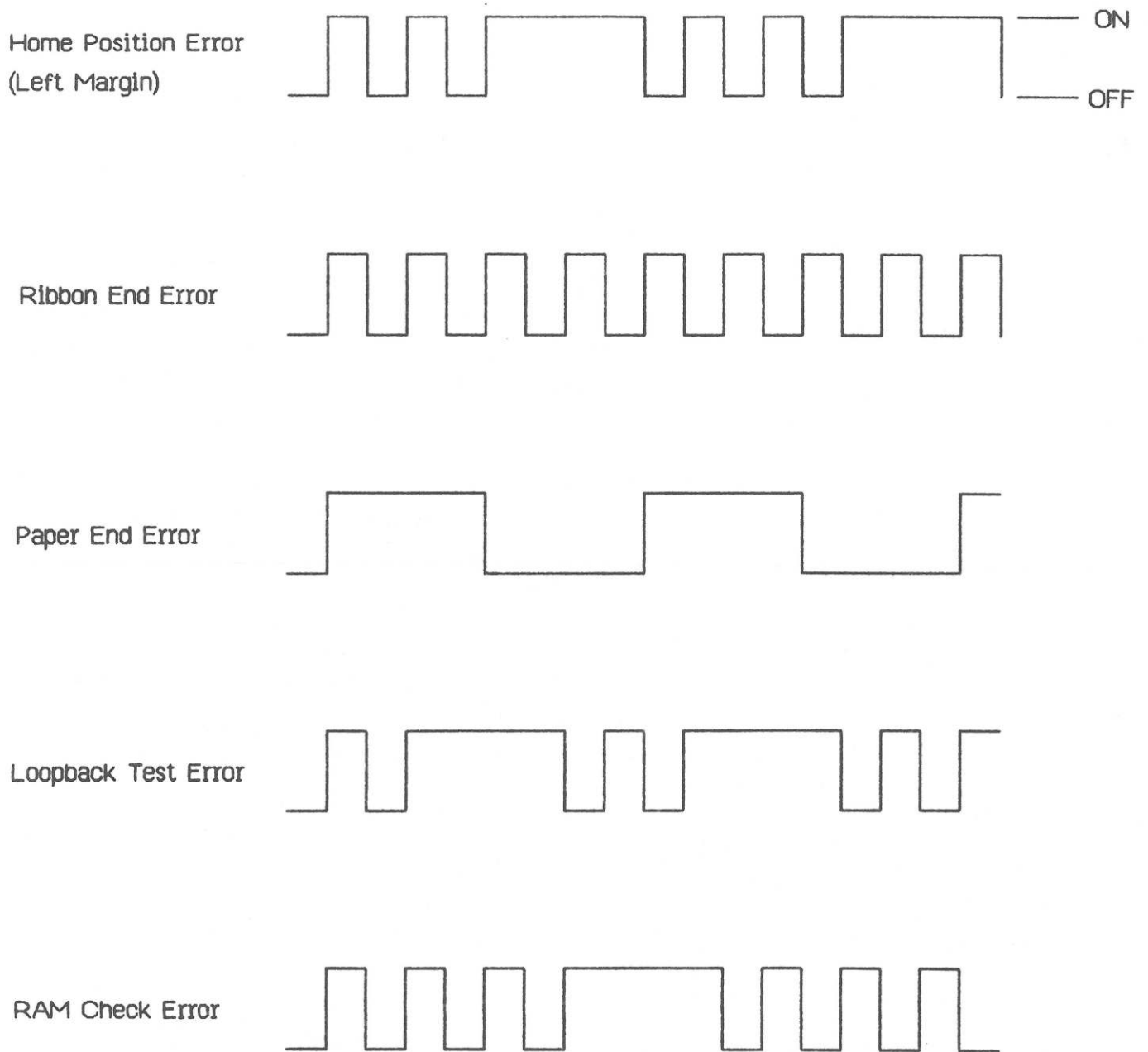


FIGURE 1

SYMPTOM TABLES

ERROR CONDITIONS

Certain error conditions are indicated by the SELECT lamp on the Scribe control panel blinking on and off in various patterns. Figure 1 indicates the different patterns and their meanings.

SYMPTOM	CORRECTIVE ACTION
Select lamp flashes slowly (Paper End Error)	1. paper is out, insert paper 2. paper is inserted too far to the right 3. clean paper detect sensor 4. replace logic board 5. replace mechanism assembly due to a defective paper detect sensor
Select lamp flashes rapidly (Ribbon End Error)	1. remove and reseal ribbon cassette 2. replace ribbon cassette and press select switch 3. replace mechanism assembly, due to a defective out of ribbon detect sensor 4. replace logic board
Select lamp flashes rapidly three times followed by a pause and then three more rapid flashes (Ram Check Error)	1. replace logic board

SYMPTOM	CORRECTIVE ACTION
Select lamp flashes rapidly two times followed by a pause and then two more rapid flashes (Home Position Error)	1. check that nut on left drive belt pulley is not overtightened. 2. check carriage belt tension 3. replace mechanism assembly
Select lamp flashes once followed by a pause and then another flash (Loopback Test Error)	1. check loopback connector is securely connected 2. replace logic board
Select lamp flashes very fast (no error condition); printer doesn't operate	1. replace ribbon 2. replace logic board
Select lamp lit continuously, carriage does not move	1. check baud rate setting of DIP switch 2. replace interface cable 3. replace logic board

PRINT QUALITY PROBLEMS

SYMPTOM	CORRECTIVE ACTION
Print is light	1. check that the type of paper being used is appropriate (refer to User's manual) 2. check DIP switch setting is appropriate for paper type being used (refer to User's Manual) 3. replace ribbon cassette with new one 4. check ribbon drive wire is connected and drive pulley is turning 5. check print head is clean 6. check print head gap 7. replace print head 8. replace ribbon drive wire 9. replace logic board
Print is dark	1. check DIP switch setting is appropriate for paper type being used 2. replace print head 3. replace logic board
Print density varies while printing on any type of paper	1. replace ribbon cassette 2. check ribbon feed mechanism, and replace mechanism assembly if defective 3. check ribbon drive wire

SYMPTOM	CORRECTIVE ACTION
Control panel keys do not operate properly	1. check control panel cable connector (CN7) is securely connected to the logic board 2. replace control panel 3. replace logic board
Prints without paper	1. clean paper detect sensor 2. replace mechanism assembly due to a defective paper detect sensor 3. replace logic board
Carriage strikes against end	1. check that nut on left drive belt pulley is not overtightened. 2. check drive belt tension 3. check home position switch; replace mechanism assembly if defective 4. check connector (CN8) securely connected 5. replace logic board
Carriage moves to center and stops after power is turned on	1. install paper and/or ribbon cassette 2. replace logic board
Carriage moves to right when power is turned on, and then stops	1. replace logic board
Print head "taps" platen once when power is turned on, and printer doesn't operate	1. replace logic board

SYMPTOM	CORRECTIVE ACTION
Printer does not operate and print head taps the platen once when power is turned off	1. replace logic board
Print head engages into platen and stays, printer does not operate further	1. replace logic board 2. check printhead after replacement of logic board is made
Carriage "jumps" once when power is turned on and then doesn't operate	1. replace logic board
Printer does not operate and platen roller reverse feeds when power is removed	1. replace logic board
Carriage jumps around then stops, when power is turned on	1. replace logic board

Scribe Printer Technical Procedures

Section 5

Preventive Maintenance

Contents:

Manufacturer's Recommended Maintenance Schedule.....	5.3
Recommended Cleaning and Lubricating Materials.....	5.3
Routine Cleaning and Lubrication After Servicing.....	5.5
Yearly Maintenance.....	5.11

MANUFACTURER'S RECOMMENDED MAINTENANCE SCHEDULE

User			
-- Once every year			
Dealer Service			
-- As required during preventive or corrective maintenance			
Dealer Service			
-- Once every year or 500,000 lines of print			
x	x	x	Clean and lubricate carriage shaft
	x	x	Clean platen
	x	x	Check drive belt tension
	x	x	Clean print head
	x	x	Clean paper-out sensor
	x	x	Clean front guide bar
			Clean and lubricate:
	x	x	a) carriage bearing stud
	x	x	b) carriage drive motor idler gear stud
	x	x	c) paper feed motor idler gear studs
	x	x	d) drive belt pulley shafts
		x	Lubricate platen sleeve bearings
		x	Lubricate tractor sleeve bearings

RECOMMENDED CLEANING AND LUBRICATING MATERIALS

Cleaning: clean absorbent cloth or piece of gauze
 small soft brush
 cotton swabs
 alcohol (isopropyl alcohol or equivalent)

Lubricating: Tellus oil #46 (Apple P/N 970-0006)

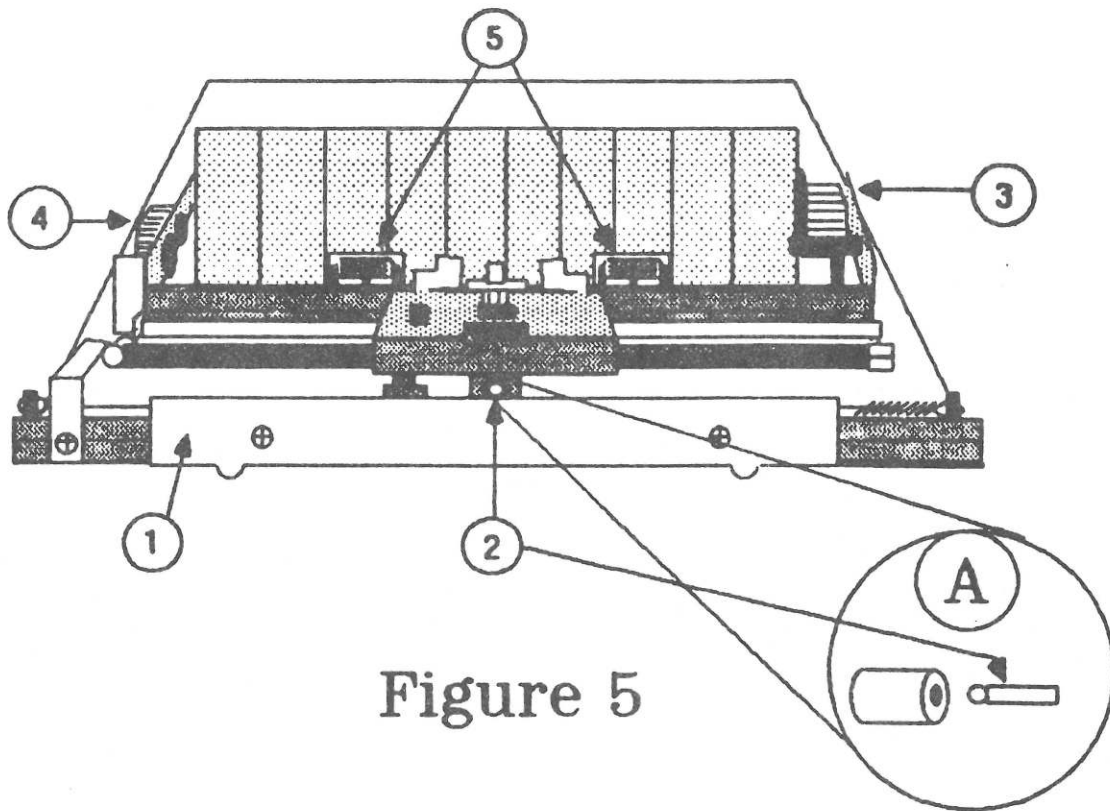


Figure 5

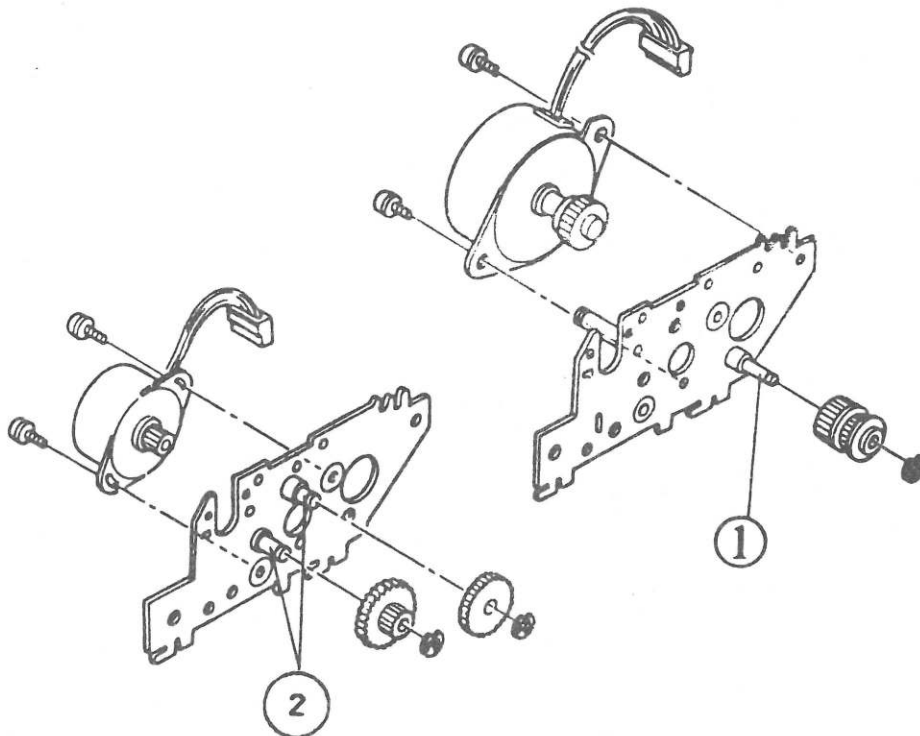


Figure 6

8. **Remove the print head and clean it** with a cotton swab moistened with alcohol. **CAUTION:** In reinstalling, be sure to reinstall the **rubber cap** over the connector.
9. **Clean the front guide bar** with a clean cloth moistened with alcohol. (See Figure 5, #1.)
10. **Clean and lubricate the carriage bearing stud** (Figure 5, #2 and detail A) as follows:
 - a) Pop the bearing off the stud with a small screwdriver.
 - b) Clean the stud; apply one drop of oil.
 - c) Replace the bearing on the stud.
11. **Clean and lubricate the idler gear stud on the carriage drive motor** (Figure 6, #1: for location see Figure 5, #3) as follows:
 - a) Loosen the drive belt (see **Section 3, Adjusting the Drive Belt Tension**) and slip it off the idler gear.
 - b) Remove the E-clip and pull the idler gear off the stud. **NOTE:** Pulling the gear off takes some effort.
 - c) Clean the stud; lubricate with one drop of oil.
 - d) Reinstall the gear and E-clip, making sure the outer lip is on the gear. (Do not reinstall the drive belt yet.)
12. **Lubricate the idler gear studs on the paper feed motor** (Figure 6, #2: for location see Figure 5, #4) as follows:

To access the idler gears:

- a) Move the carriage assembly all the way to the right.
- b) Remove the two feed rollers (Figure 5, #5) from the paper pan.
- c) Remove the two screws that hold the paper pan (one under each roller slot).
- d) Unplug the paper-out sensor cable from its connector on the logic board.
- e) Remove the paper pan from the printer assembly.

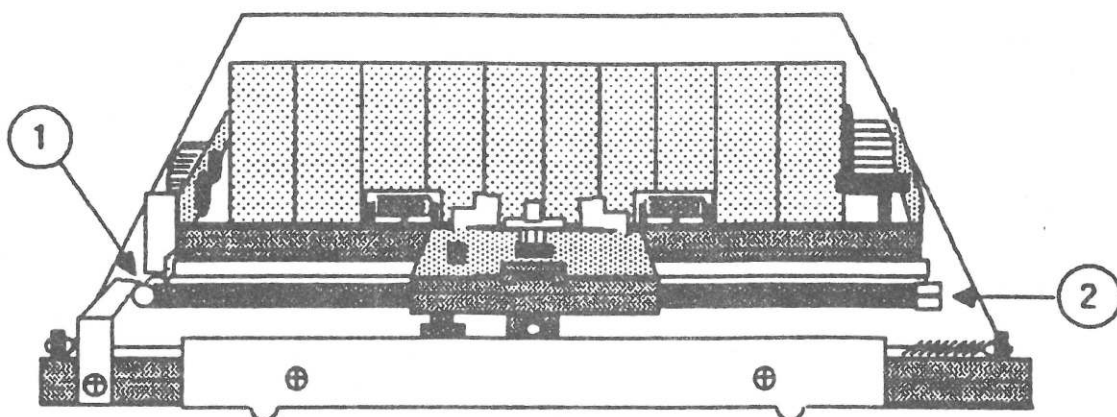


Figure 7

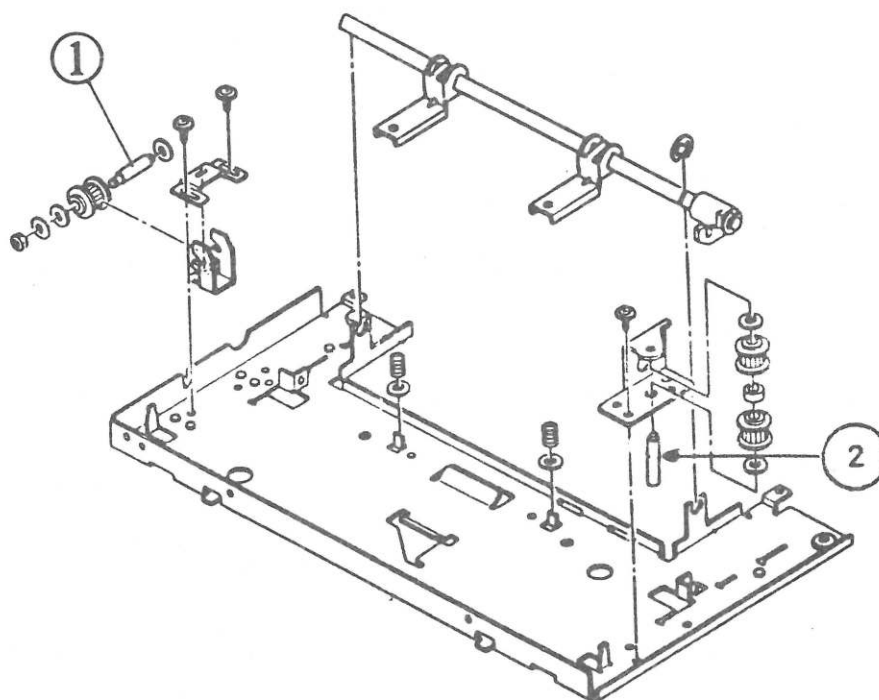


Figure 8

To lubricate:

- a) Remove the E-clip and washer from the upper bearing and pull the bearing off its stud.
- b) Clean the stud; apply one drop of oil; wipe off any excess.
- c) Put a small drop of oil behind the bearing on the lower stud (without removing the bearing).
- d) Replace the upper bearing on its stud; replace the washer and E-clip.
- e) Put the paper pan back into place, making sure to route the sensor cable **under** the square rod above the logic board, and reconnect the cable.
- f) Replace the two screws in the paper pan, making sure the copper grounding clip is in place under the left-hand screw.
- g) Reinstall the two feed rollers. (The smaller cylinders go to the front.)

13. Clean and lubricate the left drive belt pulley shaft as follows:

- a) Remove the pulley assembly from its slot (see Figure 7, #1; exploded view in Figure 8, #1).
- b) Being careful not to lose any washers, slide the shaft from the pulley assembly.
- c) Clean the shaft; apply one drop of oil.
- d) Reassemble the pulley and reinsert it in its slot.

14. Clean and lubricate the right drive belt pulley shaft as follows:

- a) Remove the two screws at the base of the right drive pulley assembly (Figure 7, #2; exploded view in Figure 8, #2), and remove the assembly from the printer.
- b) With a small pointed object, push down on the top of the shaft. Then grasp the bottom of the shaft and pull it out of the assembly. **CAUTION:** Leave the pulleys in the assembly: if you remove them, they will be difficult to reassemble.

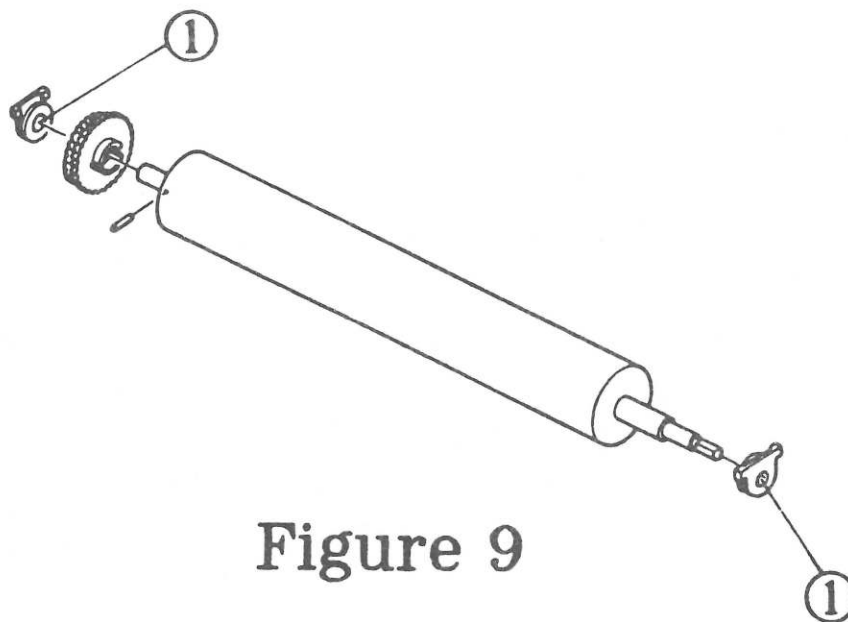


Figure 9

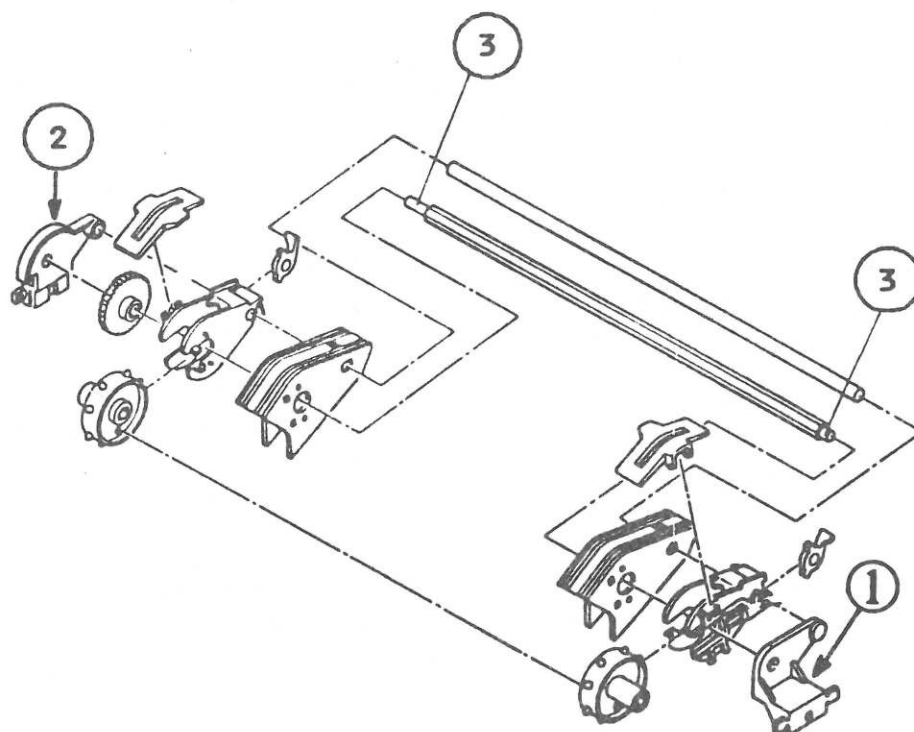


Figure 10

- c) Clean the shaft; then apply one drop of oil.
 - d) Put the shaft back through the assembly (the small end goes on top), and replace the assembly in the printer.
- 15. Reposition the drive belt and adjust the drive belt tension (see **Section 3, Adjustments**).
 - 16. Reinstall the platen assembly and tractor assembly (unless you are performing Yearly Maintenance: in that case, skip to **Yearly Maintenance**, below.)
 - 17. Replace the ribbon cartridge.
 - 18. Perform the Loopback Test to check printing performance. (See **Section 1, Basics**.)

YEARLY MAINTENANCE

Once every year or 500,000 lines of print, the following steps should be performed (in addition to the Routine Cleaning and Lubrication above).

- 1. **Clean and lubricate the platen sleeve bearings** as follows:
 - a) Remove the bearings from the platen assembly (see Figure 9, #1).
 - b) Clean the platen shaft and the bearings with a clean cloth moistened with alcohol.
 - c) Apply one drop of lubricating oil to each end of the platen shaft. Wipe off the excess.
 - d) Reinstall the bearings.
- 2. **Clean and lubricate the tractor sleeve bearings** as follows:
 - a) Pull the right side panel off the tractor assembly (see Figure 10, #1).
 - b) Pull the left side panel off the end of the tractor sleeve (Figure 10, #2). (You do not have to remove the panel completely: just expose the end of the tractor sleeve.)

- c) Clean the ends of the tractor shaft (Figure 10, #3) with a clean cloth.
 - d) Put one drop of lubricating oil on each end.
 - e) Reinstall the side panels.
3. Reassemble the printer and perform the loopback test to check operation and print quality.

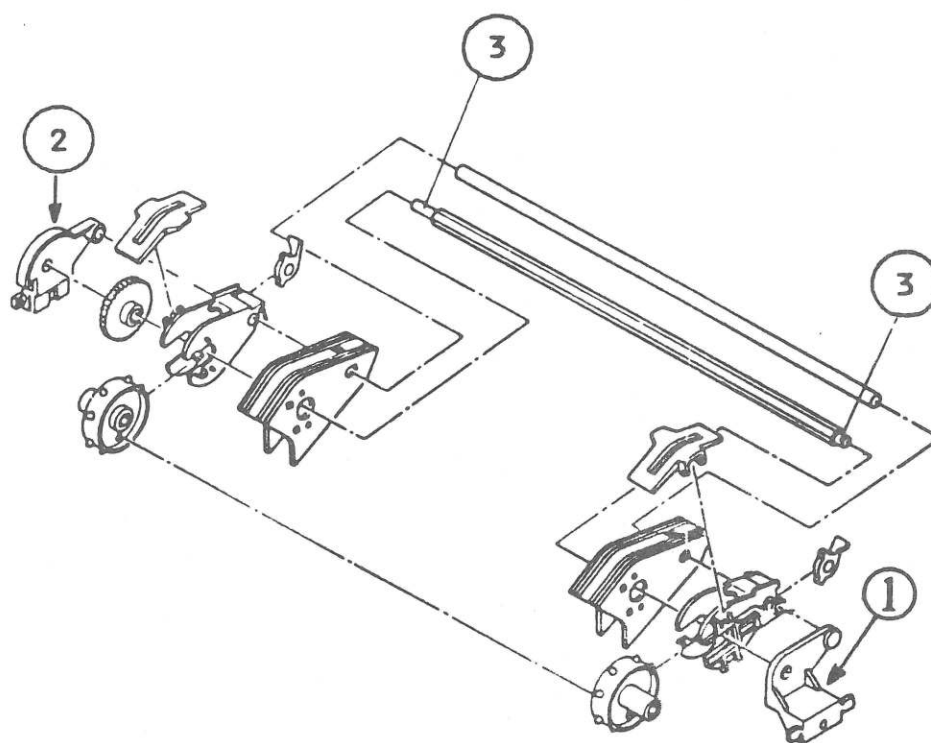


Figure 10

Scribe Printer Technical Procedures

Section 6

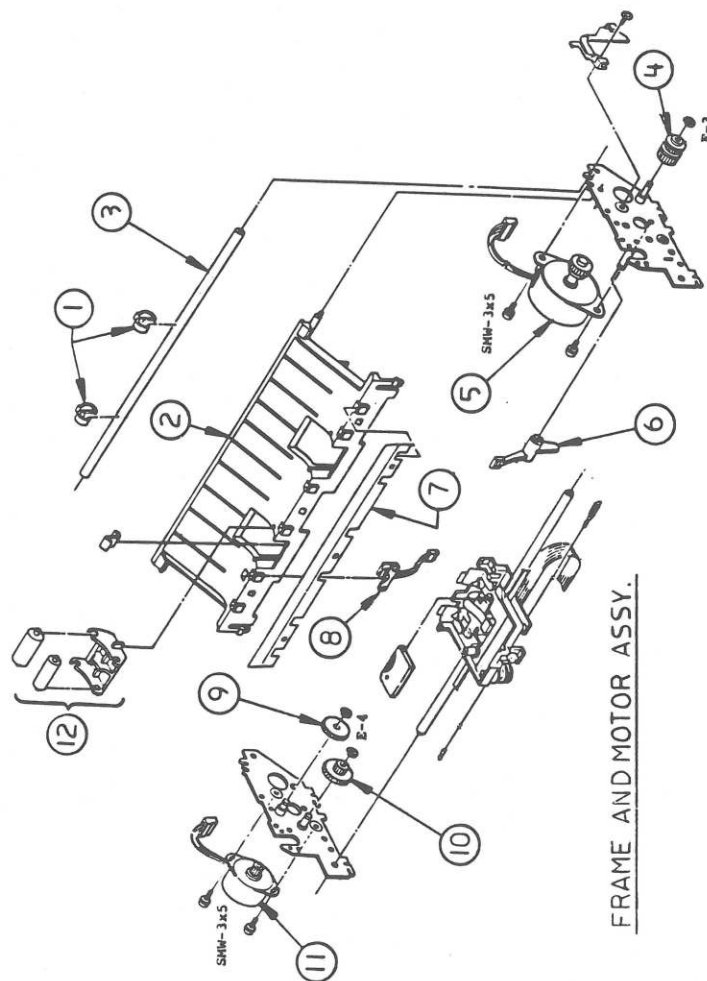
Illustrated Parts List

The figures and lists below include all piece parts that can be purchased separately from Apple for the Scribe Printer, along with their part numbers. These are the only parts available from Apple. Refer to your Apple Service Programs manual for prices.

Contents:

Frame and Motor Assembly.....	6.1
Base Assembly.....	6.3
Tractor & Platen Assembly.....	6.5
Carriage Assembly.....	6.7
Covers.....	6.9
Power Supply & Main Logic Board.....	6.11
Cables.....	6.13

NOTE: UNLESS OTHERWISE SPECIFIED



FRAME AND MOTOR ASSY.

Figure 1

REV	ZONE	ECO #	REVISION	APPRO	DATE
A		5666	INITIAL RELEASE		

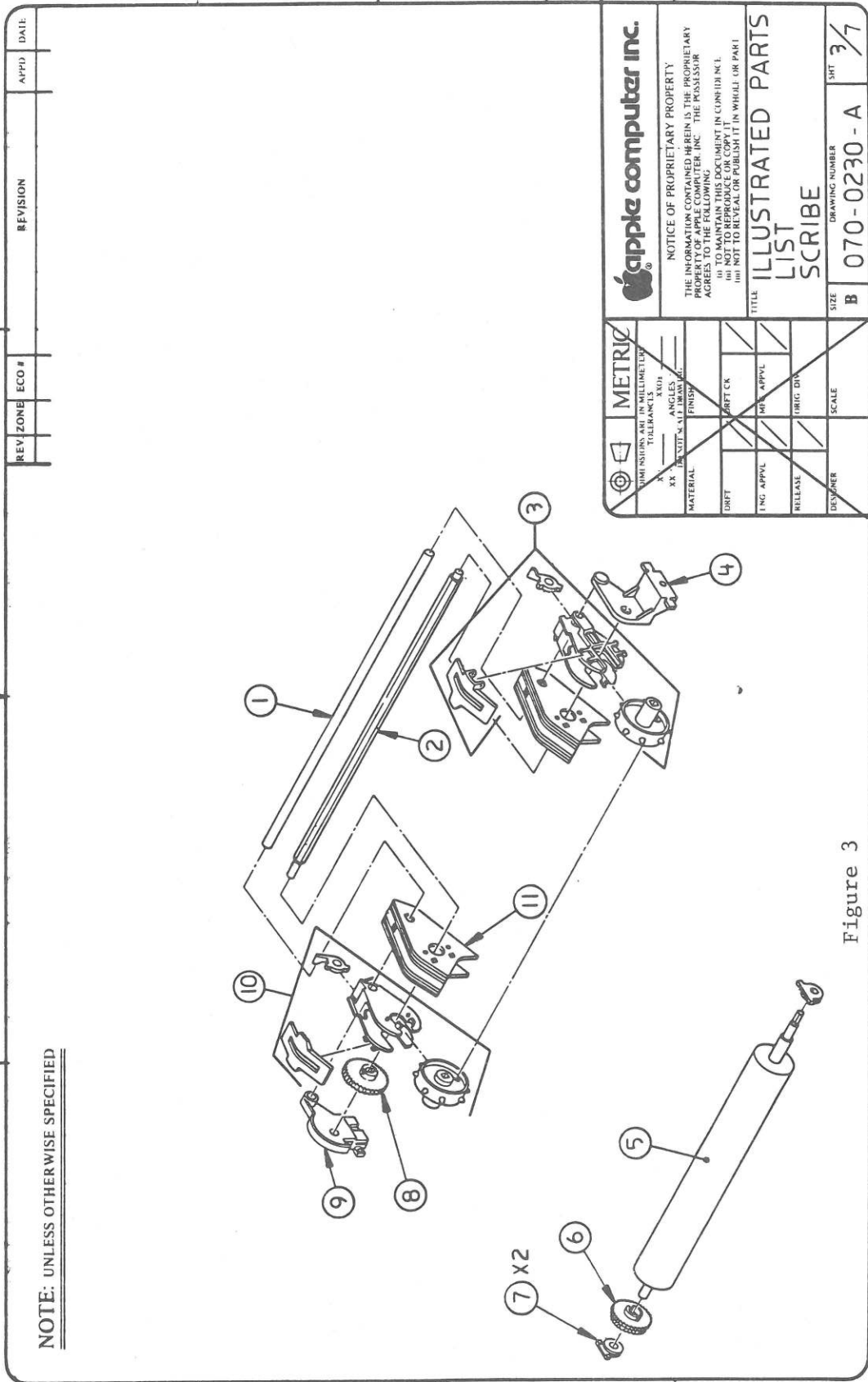
METRIC DIMENSIONS ARE IN MILLIMETERS TOLERANCES X.X - .001 X.XX - .001 X.XXX - .001 ANGLES FINISH MATERIAL UNIT ENG APPVL RELEASE DESIGNER		NOTICE OF PROPRIETARY PROPERTY THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE COMPUTER, INC. THE MANUFACTURER AGREES TO THE FOLLOWING: (i) TO MAINTAIN THIS DOCUMENT IN CONFIDENCE; (ii) NOT TO REPRODUCE OR DISSEMINATE THIS DOCUMENT OR ANY OF ITS CONTENTS; (iii) NOT TO REVEAL OR PUBLISH IT IN WHOLE OR IN PART.	
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SIZE B		SHEET 1/7	

SCRIBE PRINTER, FRAME & MOTOR ASSEMBLY (Figure 1)

Item	Part No.	Description
1	970-0943	Clip, Wire Harness
2	970-0949	Pan, Paper Feed
3	970-0911	Shaft, Frame Support
4	970-0935	Pulley, Carriage Drive
5	970-0962	Motor, Carriage Drive
6	970-0929	Lever, Feed Roller Release
7	970-0916	Plate, Paper Deflector
8	970-0971	Sensor Assembly, Out of Paper Detect
9	970-0927	Gear, Idler
10	970-0925	Gear, Idler/Platen Drive
11	970-0963	Motor, Paper Feed
12	970-0956	Feed Roller Assembly

SCRIBE PRINTER, BASE ASSEMBLY (Figure 2)

Item	Part No.	Description
1	970-0969	Shaft Assembly, Feed Roller Release
2	970-0944	Retainer, Ribbon Cable
3	970-0899	Spring, Feed Roller
4	970-0928	Collar, Carriage Drive Pulley
5	970-0903	Washer, Carriage Drive Pulley
6	970-0907	Shaft, Pulley Mounting
7	970-0966	Switch, Home Position
8	423-2001	Screw, Hex Hd, 3.0 x .50 x 12
9	970-0915	Plate, Carriage Drive Pulley Mounting
10	970-0908	Shaft, Carriage Drive Pulley
11	970-0936	Pulley, Carriage Drive, Inverter
12	970-0961	Resistor Assembly, 5 Watt Ceramic



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SIZE B	DRAWING NUMBER 070-0230 - A
SHEET 3/7	

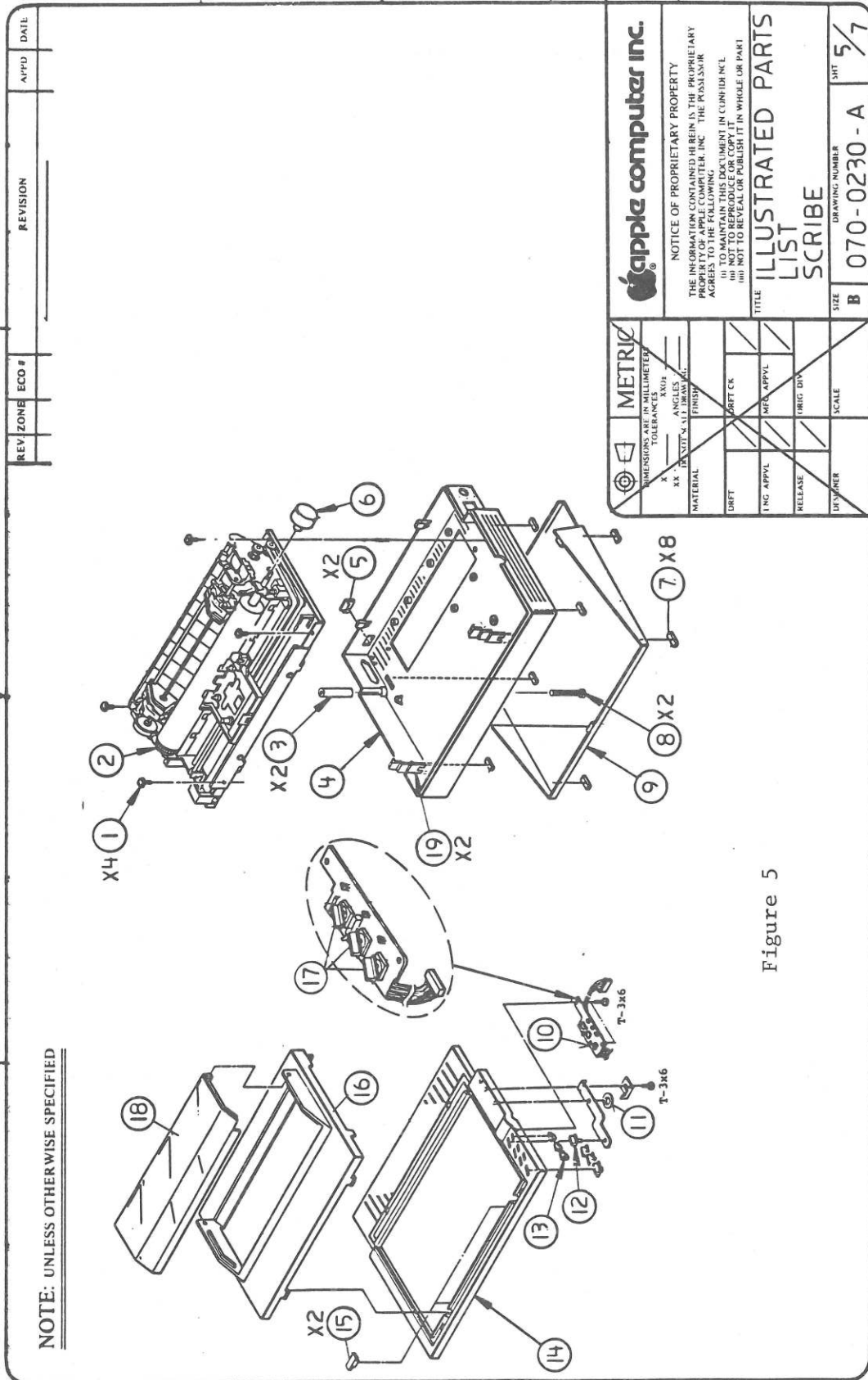
Figure 3

SCRIBE PRINTER, TRACTOR & PLATEN ASSEMBLY (Figure 3)

Item	Part No.	Description
1	970-0910	Shaft, Tractor Support
2	970-0913	Shaft, Tractor Assembly Drive
3	970-0960	Tractor Assembly, R.H.
4	970-0924	Frame, R.H. Tractor Assy
5	970-0906	Platen Roller, Rubber
6	970-0926	Gear, Platen Drive
7	970-0930	Bearing, Platen Holder
8	970-0980	Gear, Tractor Drive
9	970-0923	Frame, L.H. Tractor Assembly
10	970-0959	Tractor Assembly, L.H.
11	970-0947	Guide, Paper/Tractor

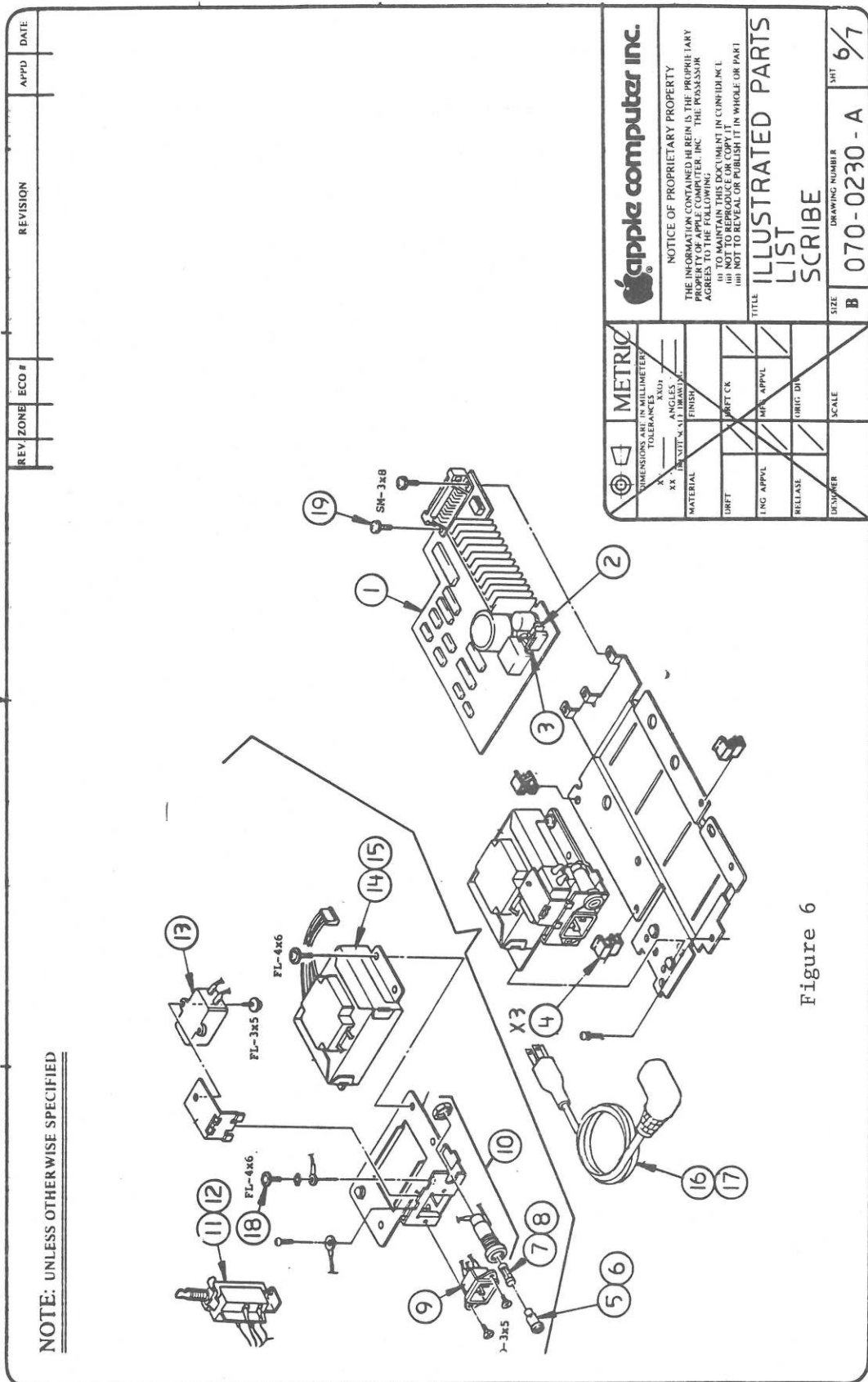
SCRIBE PRINTER, CARRIAGE ASSEMBLY (Figure 4)

Item	Part No.	Description
	970-0975	Carriage Assembly, Complete, w/o Printhead
1	970-0955	Cap, Print Head, Rubber
2	076-0090	Print Head Assembly
3	970-0972	Spring, Solenoid Assembly
4	970-0922	Guide, Paper Holder, R.H.
5	970-0957	Mounting Assembly, Print Head
6	970-0965	Sensor Assembly, Out of Ribbon Detect
7	970-0909	Shaft Carriage
8	970-0918	Clamp, Carriage Drive Belt
9	970-0970	PCB, Carriage Assembly w/Cable
10	970-0945	Washer, Ribbon Feed Friction
11	970-0919	Gear, Ribbon Take-up
12	970-0900	Spring, Ribbon, Clutch/Take-up
13	970-0914	Washer, Ribbon Take-up
14	076-0097	Spring Assembly, Ribbon Cable
15	970-0912	Collar, Ribbon Clutch
16	076-0096	Cable Assembly, Ribbon Feed
17	970-0920	Gear, Ribbon Clutch Drive
18	970-0917	Gear, Metal Ribbon Clutch Feed
19	970-0958	Gear Assembly, Ribbon Feed Correction
20	970-0940	Washer, Ribbon Feed
21	970-0937	Bearing, Carriage Assembly
22	970-0921	Actuator, Ribbon Box Detect
23	076-0095	Belt Assembly, Carriage Drive
24	970-0938	Capstain, Ribbon Drive
25	970-0964	Solenoid Assembly, Print Head
26	970-0939	Guide, Paper Holder, L.H.



SCRIBE PRINTER, COVERS (Figure 5)

Item	Part No.	Description
1	076-0089	Screw Assembly, Misc.
2	661-75218	Mechanism Assembly w/o Printhead
3	970-0978	Spacer, Cover
4	970-0973	Cover Assembly, Bottom
5	970-0948	Plug, DIP Switch
6	970-0934	Knob, Platen
7	076-0094	Feet Assembly, Rubber
8	076-0089	Screw Assembly, Misc
9	970-0967	Tray Assembly, Paper
10	076-0093	Control Panel Assembly
11	970-0904	Nut, Push
12	970-0933	Button, Power Switch
13	970-0932	Lens, Control Panel, LED
14	970-0968	Cover Assembly, Top
15	970-0946	Plug, Top Cover, Snap
16	970-0951	Cover, Printer
17	970-0931	Button, Control Panel
18	970-0952	Lid, Printer Cover
19	970-0974	Clip, Bottom/Top Cover



NOTE: UNLESS OTHERWISE SPECIFIED

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Figure 6

SCRIBE PRINTER - POWER SUPPLY & MAIN LOGIC BOARD (FIGURE 6)

Item	Part No.	Description
1	661-75217	Main Logic PCB
2	740-0400	Fuse, Medium Time Lag, 2A, 125V
3	740-0401	Fuse, Medium Time Lag, 4A, 125V
4	970-0942	Clip, PCB Guide
5	970-0712	Cap, Fuse, 110V
6	970-0713	Cap, Fuse, 220V
7	740-0101	Fuse, 2A, 250V
8	740-0100	Fuse, 1A, 250V
9	970-0983	Receptacle, AC Input
10	970-0902	Holder, AC Fuse
11	076-0091	Power Switch Assembly, 110V
12	076-0092	Power Switch Assembly, 220V
13	970-0901	Noise Filter, AC Line
14	970-0953	Transformer, AC Line, 115V
15	970-0954	Transformer, AC Line, 220V
16	970-0635	Power Cord, 110V
17	970-0710	Power Cord, 220V
18	076-0089	Screw Assembly, Misc.
19	076-0089	Screw Assembly, Misc.

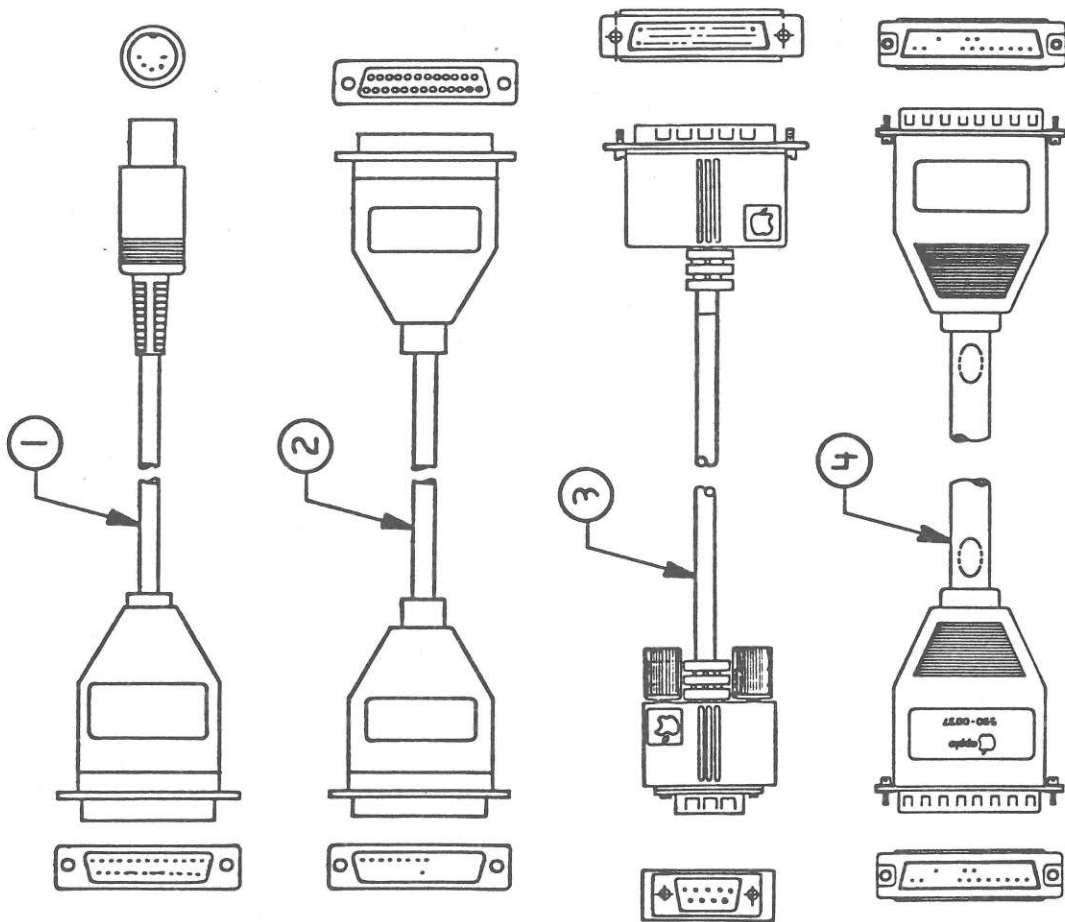


FIGURE 7

SCRIBE PRINTER - CABLES (Figure 7)

Item	Part No.	Description
1	590-0191	Cable, Printer Interface AIIC
2	590-0166	Modem Eliminator Cable Assembly
3	590-0169	Macintosh Printer Cable
4	590-0037	Serial Interface Cable