Apple Technical Procedures

StyleWriter

Technical Procedures

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Apple Technical Procedures

StyleWriter

Section 1 – Basics

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❑ INTRODUCTION

Features

The StyleWriter® printer, which is compatible with all Macintosh® computers (except the Macintosh 128K, 512K and XL), is designed with thermal ink jet technology. The features of this new, low-cost printer for the Macintosh family are listed below.

Ink Jet Technology

Ink jet technology utilizes a disposable print cartridge that contains the ink jet print head and ink. The contact points between the cartridge and the cartridge carrier on the printer frame assembly transmits the information to the ink jets and controls their outflow of ink. The quick-drying black ink and the printer's high resolution (360 dots per inch) provide a fine quality printed output. The ink cartridge can print up to 500 pages.

Two Print Methods

From the print menu, the user chooses one of two print qualities:

- **Best** – about 1/3 page per minute with 360 dots per inch
- **Faster** – about 2/3 page per minute with 180 dots per inch; includes an ink-saving mode

The actual speed depends upon the complexity of the images on the page—graphics, especially complex ones, take longer to print than text.

Background Printing

Revision B of the StyleWriter offers background printing to allow you to use your computer while printing.

TrueType Fonts

The StyleWriter requires TrueType™ fonts for high-quality printouts. The installation disks that come with the printer include the fonts, which the user installs on the computer that he or she will use with the StyleWriter.

TrueType fonts require a Macintosh computer with system software 6.0.7 (or higher). The StyleWriter TrueType fonts include Times®, Helvetica®, and Courier (with plain, italic, bold, and bold italic styles available), plus the Symbol font, which is useful in writing mathematical and scientific notations. TrueType fonts are "scalable" or "outline" fonts.

Each font contains detailed coordinate information that enables the computer system to scale the font to any size. The user does not have to install different sizes of the font—it's "one size fits all."

The StyleWriter printer can also use fixed-size ("bitmapped") fonts; if there is a bitmapped font with the same name as a TrueType font installed on the system, the printer defaults to the TrueType font.

Cut Sheet Feeder

The cut sheet feeder attaches to the printer to automatically feed a cut sheet from the tray to the printer. Up to 50 sheets (of 20 lb paper) can be placed on the tray. (Single sheets may be fed into the printer manually through the front feed slot. Envelopes, labels, and transparencies must be fed manually through the rear feed slot.)

Built-in Diagnostics

The printer has a built-in self-diagnostic function to analyze logic and hardware failures. The status lights indicate the results. The printer also performs test prints when directed to do so. The diagnostic tests and prints are:

- Power-up Logic Test – Checks circuitry on the logic board. This test runs automatically after power-up.
- Serial Loopback Test – Checks the serial interface circuitry. The servicing technician initiates this test.
- User Test Print – Provides a visual aid for diagnosing print quality. The user initiates this print.
- Technician Print Quality Test Print – Provides a detailed and calibrated visual aid for diagnosing print quality. The servicing technician initiates this print.

(See "Power-On, Self-Tests, and Test Prints," later in Basics, for instructions on performing the serial loopback test and the test prints.)

❑ SPECIFICATIONS

Printing Method	On-demand serial thermal ink jet: Replaceable ink cartridge, which contains the print head with 64 ink jet nozzles. Cartridge contains approx. 20 grams (0.9 oz.) of black ink.
Cartridge Capacity	Prints up to 500 pages
Print Resolution	360 dpi (dots per inch) in Best mode 180 dpi in Faster mode
Printing Speed	1/3 page per minute in Best mode 1/2 page per minute in Faster mode (actual speed depends on images printed)
Line Feed Speed	200 milliseconds/line at 1/6" line
Printing Direction	Unidirectional in Best mode Bidirectional in Faster mode
Image Utility	Allows conversion of 300 dpi halftone images (PICT format) for printing at 360 dpi
Printing Characters (not part of printer, but provided on installation disks for the computer)	TrueType font families: Times (plain, bold, italic, bold italic) Helvetica (plain, bold, italic, bold italic) Courier (plain, bold, italic, bold italic) Symbol (supports additional TrueType fonts from Apple and other suppliers; also supports bitmapped fonts)
Printer RAM	64K (8K used for buffer)
Input Buffer	8K
Interface	Apple-style RS-422/RS-423 asynchronous serial (1 start bit, 8 data bits, 1 stop bit), 57.6K baud
Acoustic Noise Level	Under 50 dB(A) from operator position

Paper Feed Method	Manual: Front feed for single or heavy (24 lb) sheets; Rear feed for labels, envelopes, & transparencies Automatic: Cut sheet feeder (up to 50 sheets)
Paper Capacity	Cut sheet feeder tray: 50 cut sheet input (20 lb paper) Output tray: 25 cut sheet output
Print Width & Height	Maximum printable line: 203.2 mm (8.0 inches) Minimum top & bottom margins: 6.35 mm (0.25 inch) Minimum left & right margins: 6.35 mm (0.25 inch)
Paper Sizes (printable area)	US letter: 8" x 10.5" Legal: 8" x 13.5" A4: 98 mm x 285 mm (7.8" x 11.2") #10 envelope: 8" x 3.6"
Paper Specifications	Weight: 16 lb (52 g/m²) to 24 lb (90 g/m²) Recommended: 20 lb (75 g/m²); Thickness: 0.2 mm max. Accepts most letterhead and colored stock and medium-weight photocopier transparencies & labels (Recommended: 3M™ CG3480 transparency film)
Operating Environment	Temperature: 15°C to 30°C (59°F to 86°F) Humidity: 20% to 70% RH, noncondensing (Keep printer away from wind, fans, and heat)
Power Supply	AC adapter delivering 9.5 VDC
Input Electrical Requirements	USA/Canada: AC 120 VAC 60 Hz Japan: AC 100 VAC 50/60 Hz UK/Australia: AC 240 VAC 50 Hz Europe: AC 220 VAC 50 Hz
Power Consumption	23 W maximum at 120 V 25 W maximum at 220 V
Physical Dimensions	Height with rod support installed: 32 cm (12.5 in.) Width: 33.6 cm (13.25 in.) Depth with output tray closed: 23 cm (9 in.) Weight with sheet feeder attached: 3.4 kg (7.5 lbs)

❑ PARTS IDENTIFICATION

CAUTION: *StyleWriter exists in two revisions, A and B. Revision A and Revision B main logic board and printer frame modules are not interchangeable.*

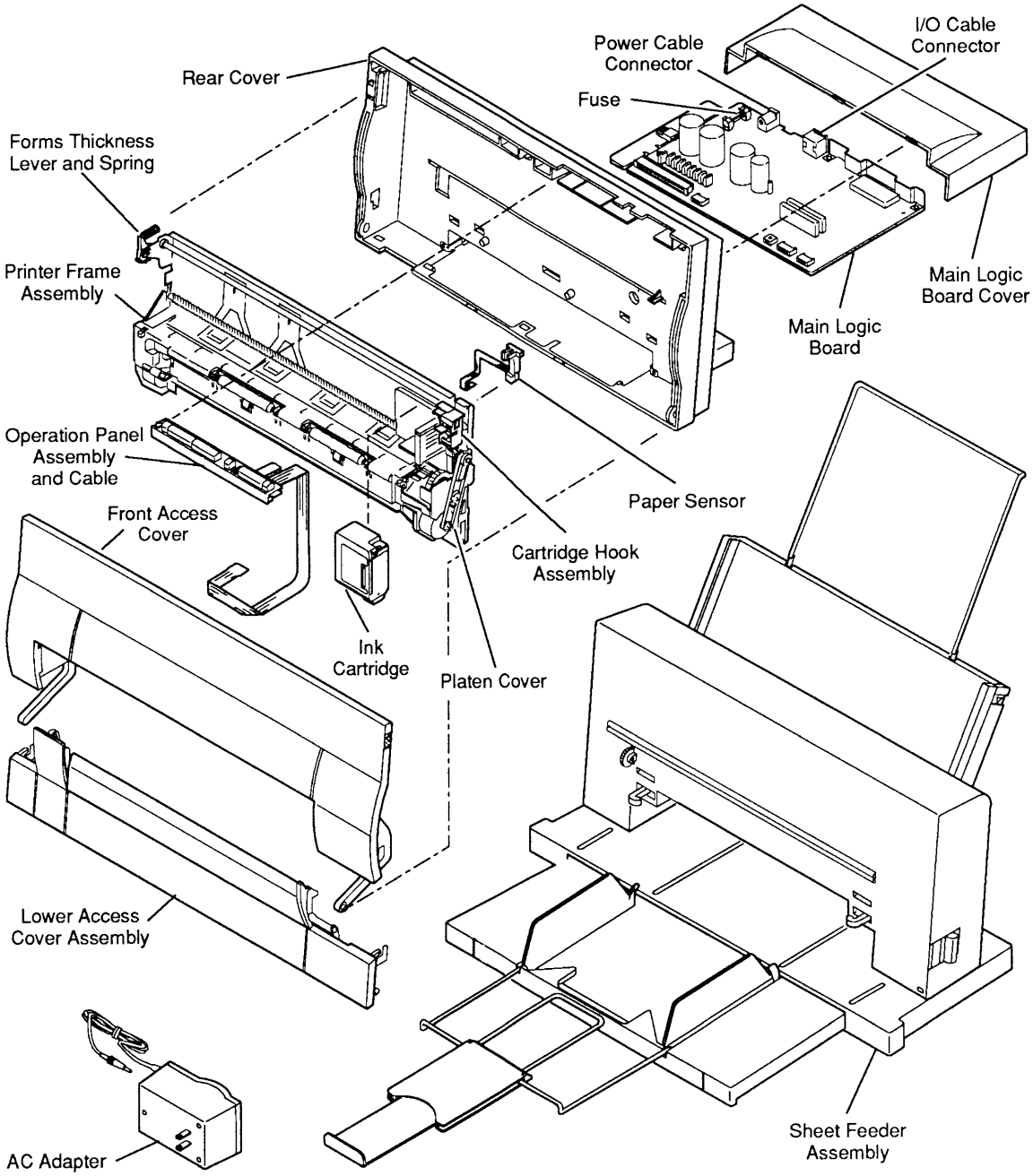


Figure 1-1 Major Modules and Assemblies

❑ SUMMARY OF PARTS FUNCTIONS

Ink Cartridge

The replaceable ink cartridge contains the ink and the thermal jet print head with its 64 nozzles.

Logic Board

The logic board controls all the operations of the printer.

Printer Frame Assembly

The printer frame contains all of the components necessary to move the carriage and the paper. The carriage holds the print head (in the ink cartridge) and moves it over the paper as printing progresses. The printer frame components are listed below:

- Cartridge carriage – Provides the mount for the ink cartridge and connects the ink cartridge electrical circuits to the logic board.
- Carriage motor – Moves the carriage horizontally along the carriage shaft and drives the purge unit.
- Cartridge hook assembly – Secures the ink cartridge to the carriage, and allows the user to remove and replace the ink cartridge.
- Forms thickness lever – Adjusts to accommodate paper thickness.
- Paper sensor – Detects when the paper has arrived in the proper position for printing. If the sensor detects no paper, the sensor sends a signal and the Error light on the operations panel turns on.

Operation Panel Assembly

The operation panel contains the control buttons and status lights, which enable the user to produce a test print, start and stop the printing process, and interpret error conditions.

AC Adapter

The AC adapter delivers 9.5 VDC power to the logic board. Different types of AC adapters are available to suit the voltages in different regions.

Cut Sheet Feeder

The cut sheet feeder attaches to the printer and feeds single-sheet paper automatically through the printer. The extendable output tray on the cut sheet feeder receives the pages as they come out of the printer and keeps them neatly stacked.

❑ THEORY OF OPERATION

Introduction

Troubleshooting Apple products can be approached in different ways; Apple usually recommends both logical troubleshooting and sequential module swapping (a trial-and-error approach). But random module swapping is not recommended for the StyleWriter printer because of the fragility of its parts. So, to troubleshoot this printer, use logical trouble-shooting to identify the defective module before you remove it. This section will help you understand how the StyleWriter printer works—so that you can more easily diagnose and repair problems.

Print Cycle

When the user gives the Print command, the Macintosh sends a bitmap of each page through the serial connection to the printer. A bitmap is a dot-by-dot guide to each letter or image on the page. The bitmap is created in Quick-Draw™, the computer's internal graphics language. The StyleWriter printer reconstructs the bitmap and activates the ink cartridge nozzles to match the bitmap, dot for dot. The StyleWriter can address 360 dot positions per inch (130,000 dots per square inch), or about 10.7 million dot positions per page.

The following list describes the basic operation of the StyleWriter printer as a total unit, from the time the user initiates a print command. (Note that many of these operations occur simultaneously.)

1. The user gives the Print command to the computer, which sends a printer initialization command to the printer.

2. The printer checks for ready status: if no error condition is detected, the paper sensor checks for the presence of paper; if paper is present, the printer gives the computer a Ready signal.

3. The purge unit cleans the ink cartridge before printing begins (and once every minute during printing).

4. The computer sends a bitmap of each page through the serial connection to the printer logic board, where the bitmap is interpreted and sent to the print head via the logic board ribbon cable.

5. The sheet feed motor rotates the rollers to advance the paper one line at a time. The carriage motor moves the print head across the paper and transfers ink to the paper to reproduce the bitmap.

6. When the printing signals stop, the carriage motor takes the ink cartridge to its home position and activates the purge unit, which cleans and caps the ink cartridge nozzles.

The following sections explain in more detail how each system in the printer performs its function.

Power Supply

The external power supply is an AC adapter with an attached power cord. This adapter provides 9.5 VDC to the logic board of the printer.

After passing through a 2.5-amp fuse and noise filter on the logic board, the 9.5 volts of DC input power goes to two DC/DC converters and a voltage regulator for generation of the required internal power supply voltages. This internal power supply area on the logic board provides:

- +5 VDC (Vcc) – Provides power for all the printer digital logic, including the CPU and the power-on reset IC. The Vcc also provides power for the power switch pull-up—even when the power is off (this power provision is necessary since the power switch must be read even when the power is off).

- +14 VDC (Vpp) – Supplies power to the carriage motor driver and paper feed motor. The Vpp reference voltage returns to the DC/DC converter IC, which regulates Vpp voltage.

- A heater voltage (VH) output – Operates the print head by suppling power to the SEG driver IC, the COM driver transistors, and the ink jet cartridge warm-up heater transistor. The exact VH voltage—+22.2 VDC, +23.0 VDC, +23.8 VDC, or +24.6 VDC—is selectable, based on the status of jumpers on the printhead itself. The voltage selection feature compensates for variances in manufacturers' tolerances for the cartridge. The DC/DC converter control IC determines which VH voltage to use, based on a reference voltage provided by the ink jet cartridge.

- -5 VDC (Vee) – Produces power for use in the interface IC.

Main Logic Board

The main logic board is the heart of the printer. Besides distribution of the voltages, the logic board also handles the logic that controls the printer and creates the drive signals for the ink jet cartridge. All signals that affect the operation of the printer go to the logic board.

CAUTION: *StyleWriter exists in two revisions, A and B. Use the logic board designed for Revision A only with StyleWriter Revision A; use the logic board designed for Revision B only with StyleWriter Revision B.*

The logic board has the following circuitry:

- ROM (Read-Only Memory) – The ROM contains all the CPU instructions necessary to operate the printer, including the built-in start-up and self-test routines.

- RAM (Random-Access Memory) – The two 64K X 4-bit DRAMs provide a 10K receive buffer, a two-line print buffer, and a work area.

- CPU (Central Processing Unit) – The 8-bit CPU operates the printer and has a 10 MHz clock. The CPU provides paper drive and head positioning signals and communicates with the printer controller ICs via a 20-bit address bus and an 8-bit data bus. The CPU reads head-positioning signals and monitors some switch functions and a temperature sensor.

- Printer Controller – The printer controller contains the following:

  - Interface controller

  - DRAM (Dynamic Random-Access Memory) controller

  - Print head controller

  - H-V (Horizontal-Vertical) converter

  - Address decoder

  A 20 MHz crystal clocks the printer controller independently to provide proper timing for the interface and DRAM bus. A 2.5 MHz clock in the CPU controls CPU bus timing.

Interface

Serial port interfacing is through 26LS32/26LS30 receiver/transmitter ICs.

Data Flow

The data flow in the StyleWriter printer is as follows:

1. The printer controller receives a bitmap of each page from the host computer over the RS-422/423 interface and stores it in the receive buffer area of the DRAM.

2. The MPU (Main Processing Unit) analyzes, decompresses, and edits the bitmap data and stores the edited data in the work area of DRAM.

3. Next, the MPU converts the bitmap data from horizontal to vertical in the H-V (Horizontal-Vertical) conversion section of the printer controller and stores the converted data in the print buffer area of DRAM.

4. While the H-V conversion is taking place, the MPU determines the number of each print dot and supplies that number to the heater control circuit for the print head.

5. From DRAM, a printer initialize signal (INIT) goes to the printer controller and CPU, and the printer controller signals the busy status to the operations panel.

6. The CPU initializes the printer and sends the bitmap data in the DRAM print buffer to the print head via the printer controller.

7. The print head controller converts the bitmapped print data to COM and SEG head drive signals that activate the 8 x 8 (64) nozzle matrix.

Ink Jet Cartridge

The ink jet cartridge contains all the components required for the generation of the ink dot pattern used in printing. These components include the ink sponge and ink jet head unit, along with the cartridge body and covers. The ink jet printing system prints characters and graphics by firing ink drops at the paper from thin nozzles. Heating the ink in these nozzles produces bubbles that quickly expand and eject the ink. The heat is generated by applying electrical pulses to the heating elements built into each nozzle.

The structure of the ink cartridge is shown below (**Figure 1-2**).

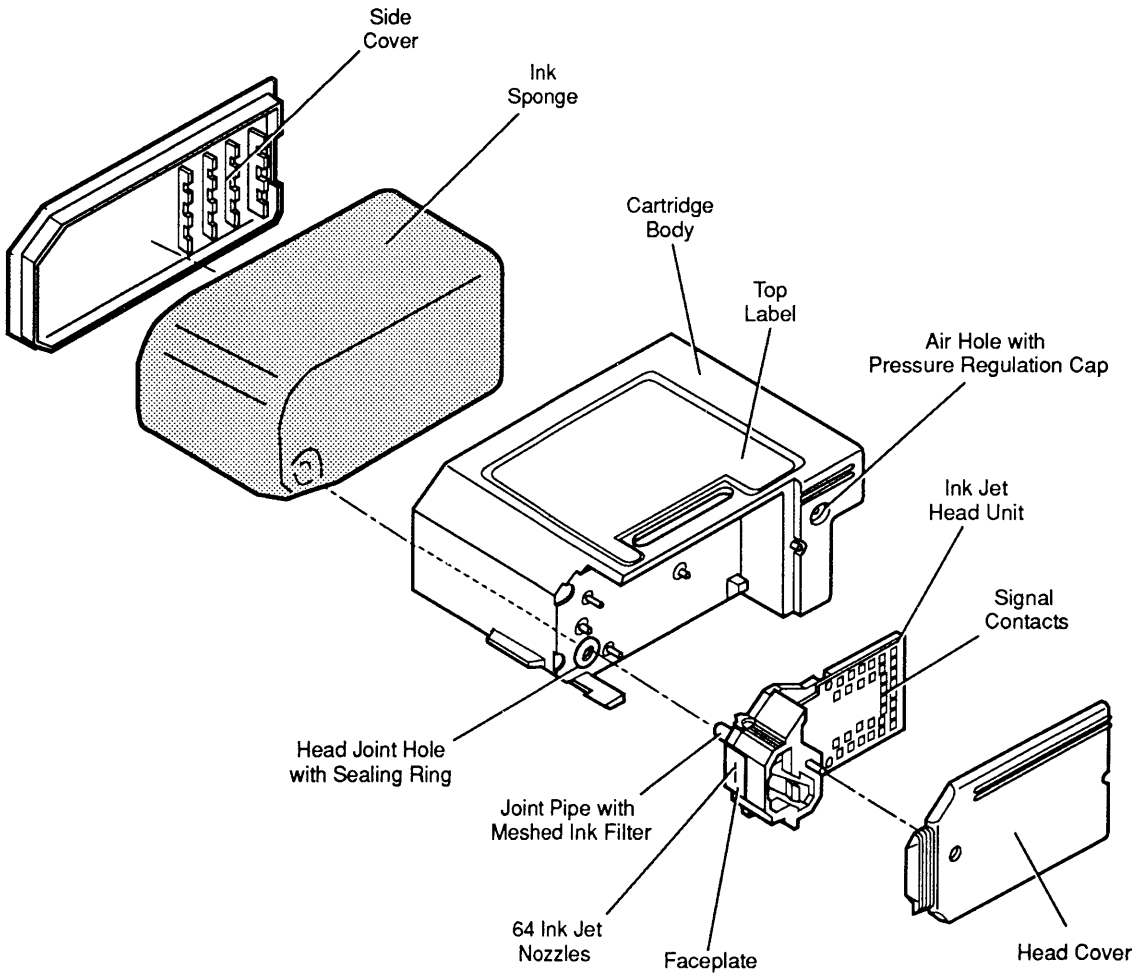


Figure 1-2 Ink Cartridge Structure

Ink Jet Head Unit Structure

The ink in the ink sponge passes through a mesh ink filter to remove dust and flows to the ink jet nozzles through a joint pipe. When the head drive current flows through the heater plate of a nozzle, the ink boils and many small bubbles accumulate into a large bubble. The head drive current shuts off before the drop of ink ejects from the nozzle, but the bubble continues to grow due to latent heat on the heater—and the drop of ink ejects from the nozzle at about 12 meters/second. The loss of the ink creates a vacuum that draws fresh ink from the ink sponge (**Figure 1-3**).

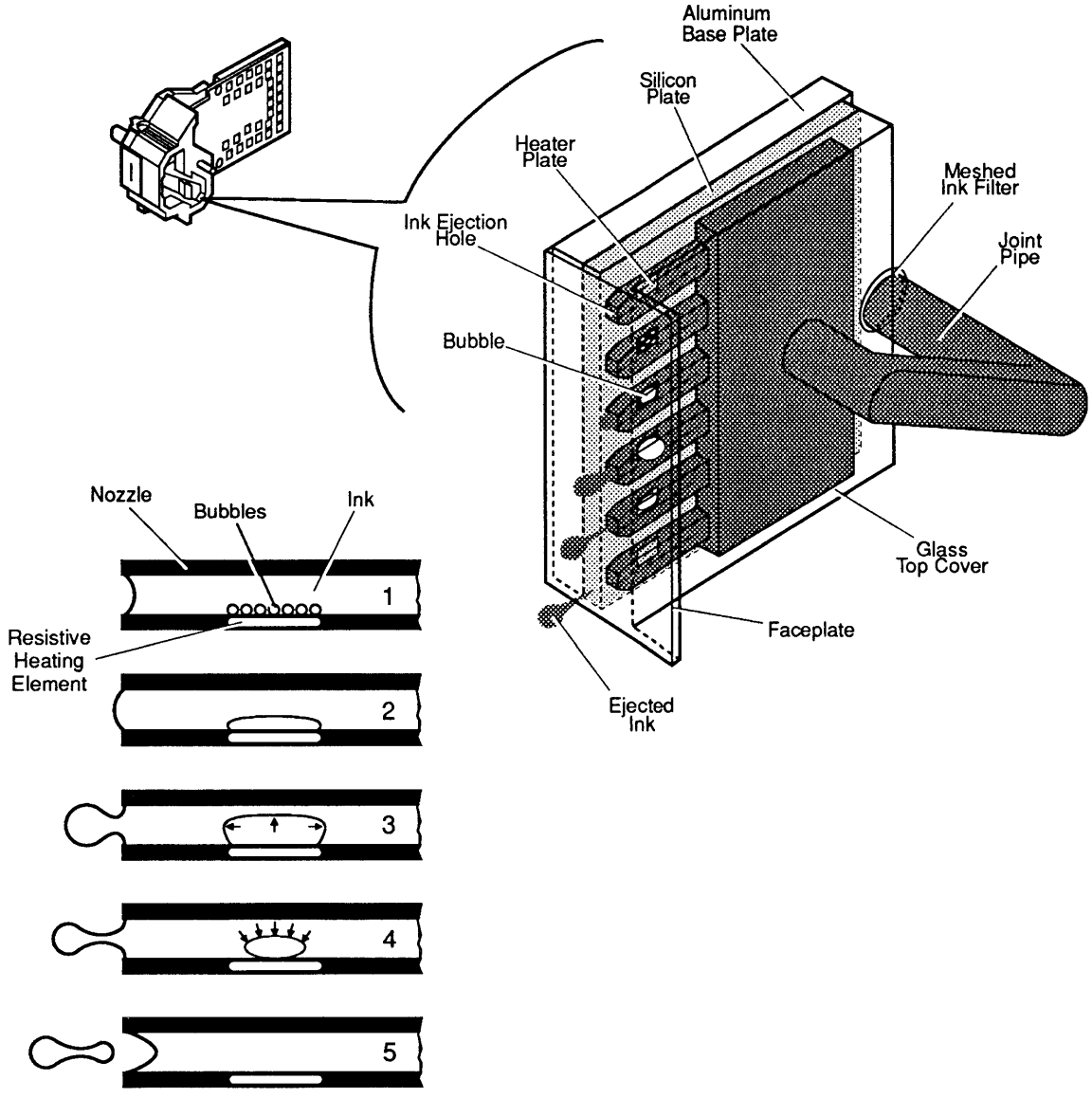
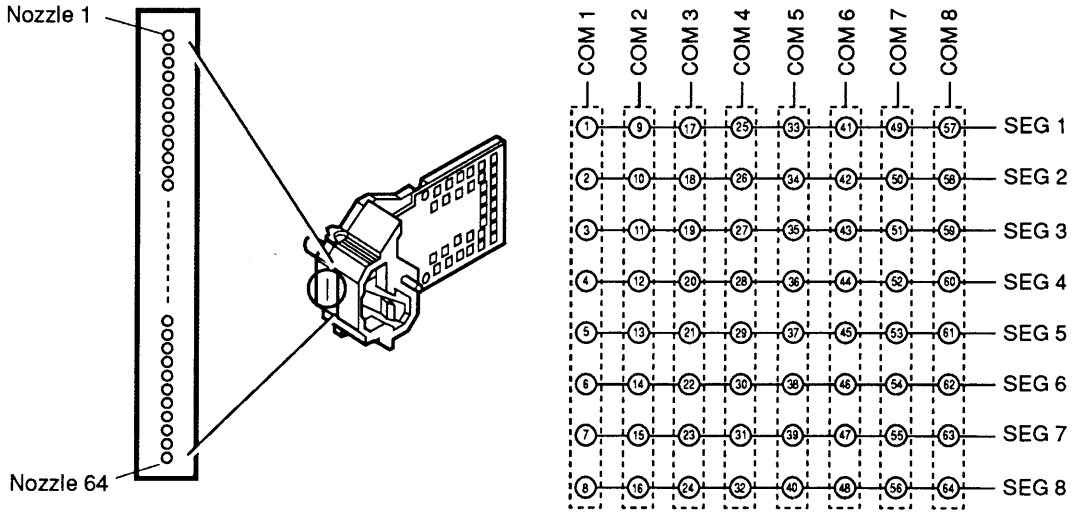


Figure 1-3 Ink Jet Operation

Nozzle Arrangement

The ink jet nozzles are arranged in the print head in a vertical line of 64 nozzles spaced at 1/360th of an inch. The 64 head-heater plates are controlled by the matrix of 8 COM and 8 SEG signals from the logic board (**Figure 1-4**).



Mechanical Nozzle Arrangement

Electrical Nozzle Arrangement

Figure 1-4 Nozzle Arrangement

Printing Signals

The COM signal connects circuits COM1 to COM8 to the head drive power supply (VH) so the 64 nozzles are ready to print in groups of eight. While the COM signal connects to the head drive power (VH), which applies heater voltages to the heater plate, the SEG signal connects the SEG1 to SEG8 circuits to ground. The combination of SEG and COM signals creates the 8 X 8 matrix, which equates to the 64 print head drive signals.

Heater Voltage

The printer corrects any manufacturing variations in the ink cartridges by selecting one of the four heater voltages (used to determine ink jet speed). A pattern of contacts on the printed circuit area of the print head indicates the heater voltage ID for any specific print head unit.

Temperature Control

The optimum temperature of the ink jet cartridge for high-quality printing is 73.4°F (23°C). The print head has temperature sensors and warm-up heaters on the silicon plate. A sensor on the printer logic board determines the temperature of the cartridge from the ambient room temperature. When the sensor detects a temperature lower than 68°F (20°C), the print head nozzles are warmed by the applying the heater voltage to the head unit, which in turn heats the nozzles.

❑ SAFETY AND HANDLING

High-Temperature Components

The temperature of the regulator IC (Q14) and transistor (Q13) that produce the logic circuit Vcc rises to about 140°F (60°C) when the printer is on. Do not touch these components when the printer is on.

Fragile Plastic Parts

The StyleWriter printer has many plastic parts. Be careful not to bend or break any of the plastic tabs when taking apart the printer. Most of the plastic parts are made of a hard plastic that contains glass fiber; the viscosity is low to increase the precision of the tooling. As a result, the plastic tabs are very easy to break. Use precision screwdrivers or tweezers for take-apart and do not apply excessive force when releasing a tab.

Ink Stains

The ink used in the ink cartridge is not toxic but contains isopropyl alcohol 67-63-0, which means the ink must be kept out of mouths and eyes. Keep the ink cartridge out of the reach of children.

The ink contains an indelible dye that stains clothing. To avoid getting ink stains on your hands, clothing, tools, and work area, do not shake the ink cartridge or touch anything in the printer path.

After the printer has been used for several months, ink mist may coat the insides of the front access and lower access covers. To avoid getting ink on your hands, use a damp cloth to wipe away any accumulated ink before you begin servicing the printer.

The ink conducts electricity. If ink leaks onto a mechanical part or the logic board, turn off the printer and disconnect the AC power adapter. Wipe the ink off mechanical parts with a soft cloth. Use tissue paper to clean ink completely from the bottoms of logic board components.

CAUTION: *To avoid circuit damage, wipe away all ink before switching the power on.*

If the printer is picked up, moved, or stored without an ink cartridge in it, the ink remaining in the purge unit may flow backwards and stain the inside of the printer. If the printer has no cartridge, perform the purge operation (under "Purging the Ink Cartridge") three times to clear any remaining ink from the purge unit.

Electrostatic Discharge (ESD) Prevention

The StyleWriter printer carriage contacts and logic circuitry are sensitive to damage from static electricity that may discharge from your body or clothing. If static electricity is discharged at the carriage contact points, the characteristics of the chip resistors (R4, R5, R6, and R7) and chip capacitor (C30) used in the heater voltage select circuit on the logic board may change, and the correct heater voltage for the ink cartridge may not be generated. If the voltage is incorrect, the print quality deteriorates. To prevent such damage, wear a grounding wriststrap or heelstrap and work on a grounded workbench mat when servicing the printer. (For ESD prevention rules, see Section 6, Electrostatic Discharge, under the *You Oughta Know* tab).

Additional Safety Tips

Follow these additional safety tips to avoid harm to the printer:

- Don't move the carriage manually—you could damage delicate mechanical parts.
- Don't attempt to print anything when the front access door is open—you could cause a paper jam.
- Don't oil the inside of the printer.
- Don't use ammonia-based cleaners on or around the printer—they may react with the plastic.
- Before you unplug the printer, be sure it is switched off—switching the printer off ensures the print head will be capped.

❑ INK CARTRIDGE

Protective Functions of the Printer

The disposable ink cartridge contains the print head and ink. Both the Apple and the Canon versions of the ink cartridge work in the StyleWriter printer. The printer has automatic maintenance functions (priming, purging, wiping, and capping) that protect the ink cartridge.

Priming Function

To prevent the nozzles from clogging, the printer has a priming function that ejects ink from all the nozzles of the cartridge. The priming function works automatically

- When you switch on the Power button
- Before the printing starts
- Every 12 seconds during printing

Purging Function

To ensure optimum print quality, the printer also has a purging function that draws 0.1 ml of ink through the ink nozzles to fill them with fresh ink. A purge, with the wiping function (see below), is performed under two conditions: 1) every time the machine is switched on after the AC adapter is connected, and 2) when the printer sits idle for more than 72 hours while switched on and connected to the adapter.

The user can also perform a manual purge, which is necessary to prepare a new ink cartridge for operation. (See "Purging the Ink Cartridge" later in Basics.)

Wiping Function

A wiping function, which wipes dust and ink off the cartridge nozzle surfaces with a rubber head wiper, occurs automatically

- After priming or purging
- Every 60 seconds during printing
- Before capping (see below)

Capping Function

The printer caps the cartridge nozzles with the purge unit cap after the carriage returns in front of the purge unit. The cap prevents the cartridge from drying up, leaking ink, or collecting dust. The nozzles are capped automatically

- When the printer has not received a print start command in the last five seconds while on-line
- When the printer goes off-line
- Three seconds after you switch off the Power button

Installing the Ink Cartridge

Do not open the ink cartridge package before you are ready to install the cartridge. After opening the package, carefully remove the head cover and tape that protect the nozzles during shipping and storage. Do not touch or wipe the nozzles. The cartridge cannot be cleaned. Do not leave the cartridge outside the printer without the head cover and sealing tape.

1. Make sure the printer power is off.

2. Open the front access cover.

3. Place the ink cartridge over the mounting post **(Figure 1-5A)**, and push down on the cartridge until it snaps into place **(Figure 1-5B)**.

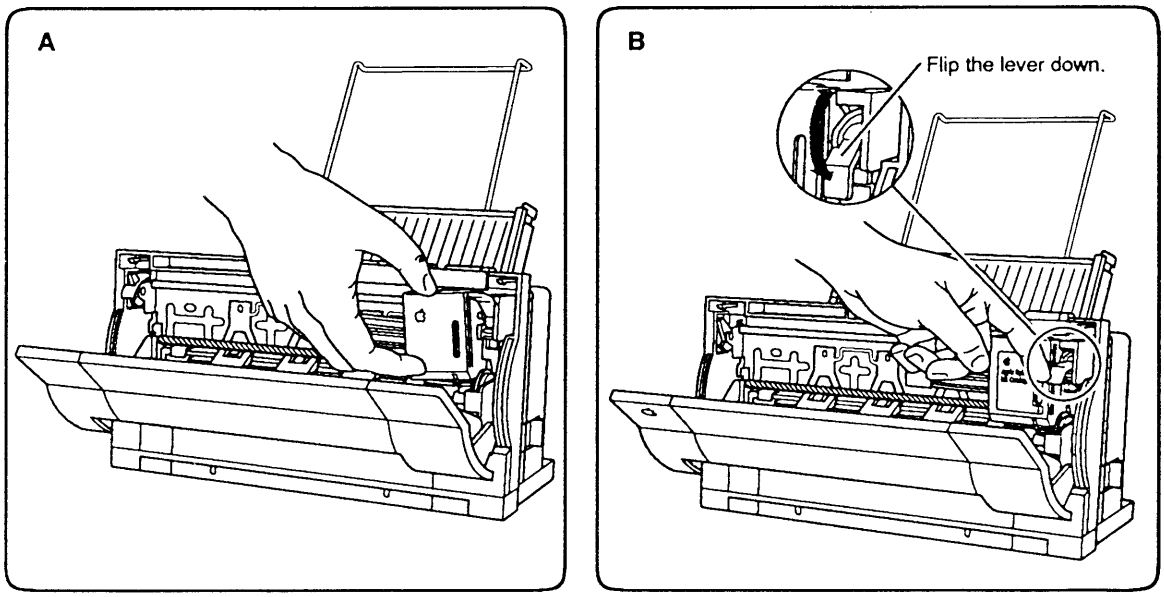


Figure 1-5 Installing the Ink Cartridge

4. Close the front access cover.

5. **Perform the manual purge operation before you attempt to print** (see Purging the Ink Cartridge).

Purging the Ink Cartridge

Always do a manual purge after you install a new cartridge. Also purge the ink cartridge five times whenever the printer exhibits print quality problems. Purging the cartridge forces air out of the ink nozzles. Follow these steps to perform a manual purge:

1. Switch off the Power button (the printer must be off before you begin).

2. Press and hold the Ready button.

3. Press the Power button once and release both buttons at the same time.

When finished printing, **always switch the power off using the power button.** After the power is switched off for three seconds, the printer caps the ink cartridge automatically to prevent ink leakage and nozzle clogging. **If you turn off power to the printer by pulling the power adapter cord, the cartridge will not be capped.** If the nozzles are not capped, they may become clogged with dry ink, or ink may leak from the cartridge.

Removing the Ink Cartridge

Leave the cartridge in place when the printer is not in use. Also leave the cartridge in place when moving the printer. If the ink cartridge is taken out of the printer, the ink nozzles may dry up and become unusable. Remove the cartridge only to replace it or to service the printer. To remove the ink cartridge,

1. Make sure the power is off.

2. Open the front access cover.

3. Lift the cartridge lever and pull the cartridge off the mounting post.

The print head must be sealed and capped immediately after removal from the printer. Even if the ink cartridge is ready for replacement, the ink may leak out if you do not seal the print head. When installing a new ink cartridge, save the orange tape and end cap to use on the replaced ink cartridge. If you will be using the removed cartridge again, be especially careful to seal the cartridge to prevent the ink from drying and clogging the nozzles. Cellophane tape will not work—the adhesive may clog the nozzles.

Cartridge Shelf Life

The StyleWriter printer ships with a cartridge installed. Cartridge shelf life is approximately six months once you open the cartridge and install it in the printer, and 18 months while in the package. Expired cartridges will not damage the printer, but may require extensive purging to get good prints.

❑ PRINTER HARDWARE SETUP

The *StyleWriter Owner's Guide* contains detailed instructions to the user for setting up and operating the StyleWriter printer. Since you may see problems that are the result of incorrect software installation, we have summarized some important elements of the owner's guide here for your information.

To connect the StyleWriter to a Macintosh computer, make sure the computer is switched off. Attach one end of the peripheral-8 cable to the printer or modem port on the computer. Connect the other end to the serial port on the back of the printer, as shown in **Figure 1-6**.

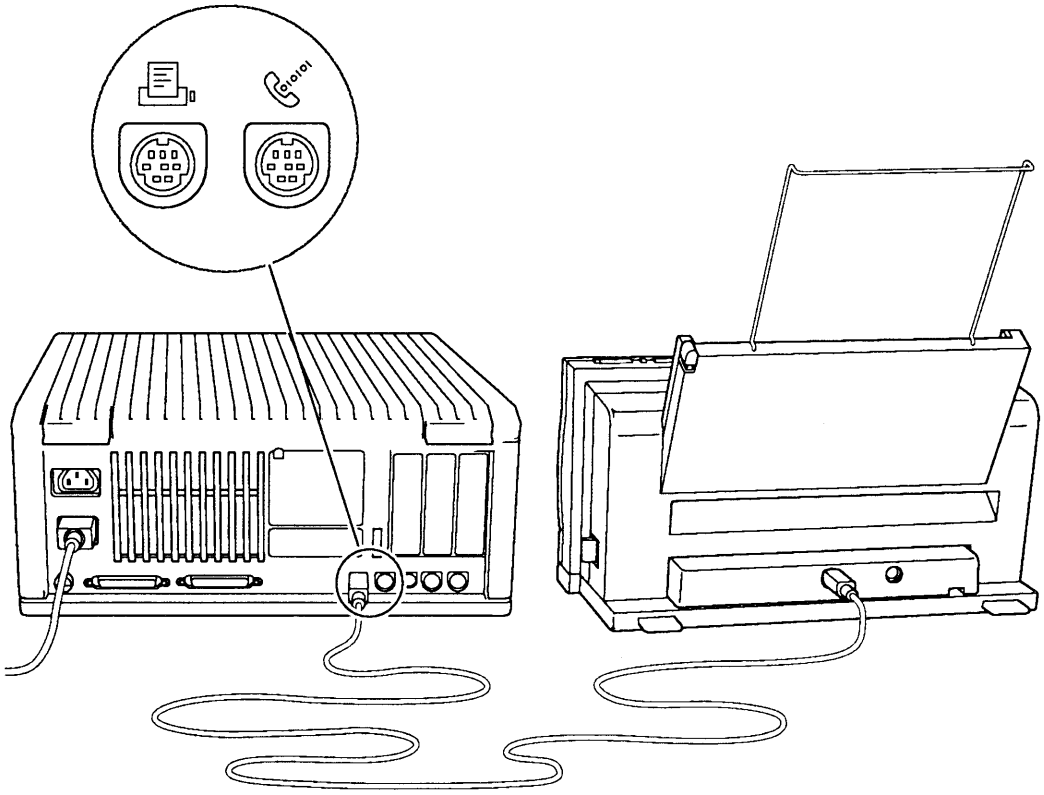


Figure 1-6 Making the Serial Connection

Connect the power cord to the StyleWriter; then plug the adapter into a wall outlet as shown in **Figure 1-7**. (Adapters for countries other than the U.S and Japan use a different configuration; the adapter sits between two segments of power cord.)

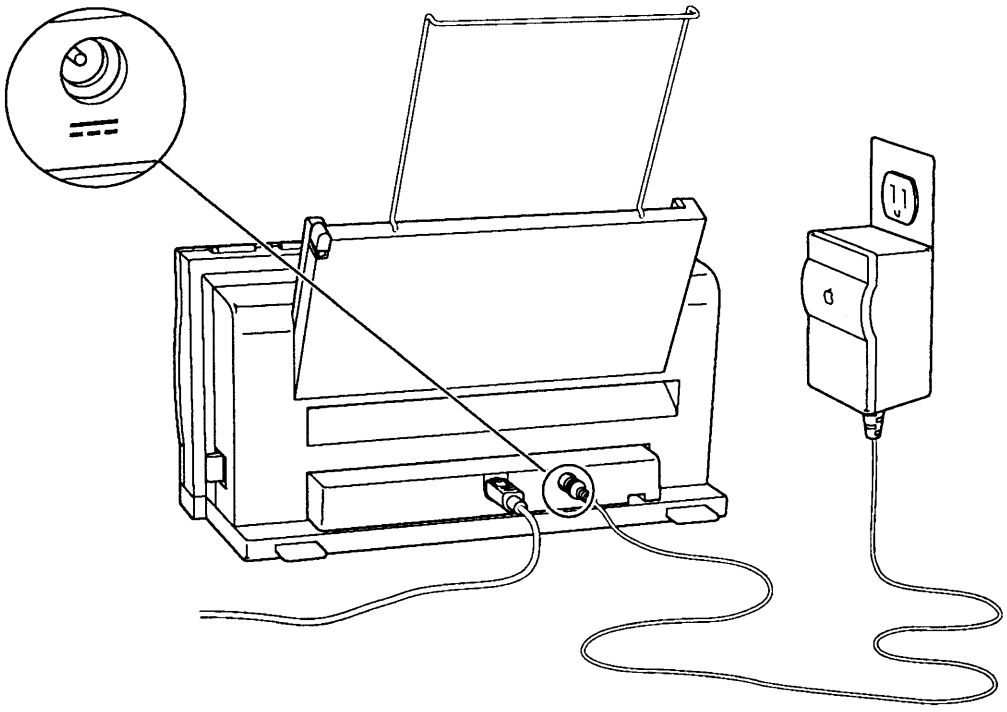


Figure 1-7 Making the AC Power Connection

❑ SOFTWARE INSTALLATION

The disks that come with the printer accessory kit contain the printer driver, the Installer program, and the TrueType fonts. The StyleWriter can use TrueType and fixed-size (bitmapped) fonts—in fact, the user can have fixed-size and TrueType versions of the same font installed in the system. Keeping both versions of a font takes up more space, but it has two advantages. First, it allows the Macintosh computer to display and print the font correctly, even when memory is low. Second, it prevents old documents that use the fixed-size font from repaginating.

IMPORTANT: *The Macintosh computer used with the StyleWriter printer must have system software 6.0.7 or later. If the customer has an earlier version of the system software, perform a system upgrade before you proceed.*

The Installer program on the *StyleWriter Installation* disk makes the process easy for the user:

1. Boot the installation disk and double-click the Installer icon. Make sure the disk named on the screen is the one on which you want to install the software (if not, click **Switch Disk**).

   The Installer has a custom feature that allows the installation of software that supports other printers besides the StyleWriter. If you click the **Customize** button, you'll see a list of specific items you can select for installation.

   Click **Install** to launch the program. The Easy Install status box appears to keep you informed of progress during the installation.

2. When the *StyleWriter Installation* disk ejects, insert the *TrueType Fonts* disk. (If the Macintosh computer has no hard disk and you are installing on floppy disks, you will have to swap disks a number of times before the process is finished.)

3. When the *TrueType Fonts* disk ejects, follow the instructions and insert the *StyleWriter Installation* disk again. When you see a message reporting that the installation was successful, click **Restart**.

4. Open the Chooser and identify the port (printer or modem) to which you have the printer connected.

❑ PAPER SETUP

Connecting the Cut Sheet Feeder

Make sure the latches on the side of the cut sheet feeder are unlocked (pushed toward the rear of the feeder) (**Figure 1-8A**). Slide the printer in as far as it will go (**Figure 1-8B**) and push the latches forward to lock the sheet feeder in place **(Figure 1-8C)**. To unlock the sheet feeder, push back the latches and slide the printer out.

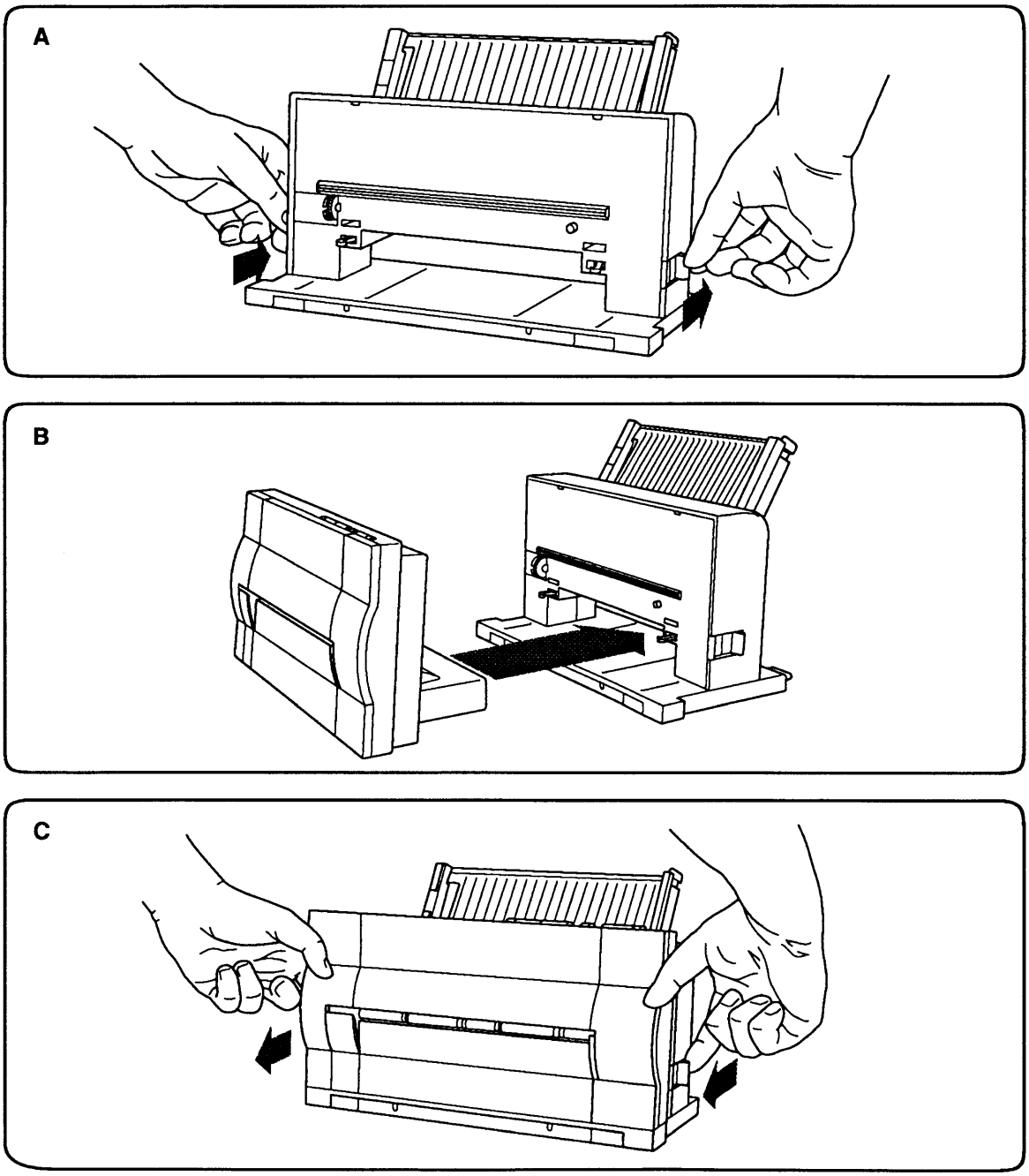


Figure 1-8 Connecting the Cut Sheet Feeder

Loading Paper

To ensure optimum print quality, use 16 lb to 24 lb plain cotton bond, typewriter-quality paper without curls, folds, or damaged edges. Paper thickness should be under 0.2 mm. Paper should be stored at 18°C to 24°C (64°F to 75°F) at 40% to 60% relative humidity.

Automatic Feed

Figure 1-9 shows how to load paper into the cut sheet feeder.

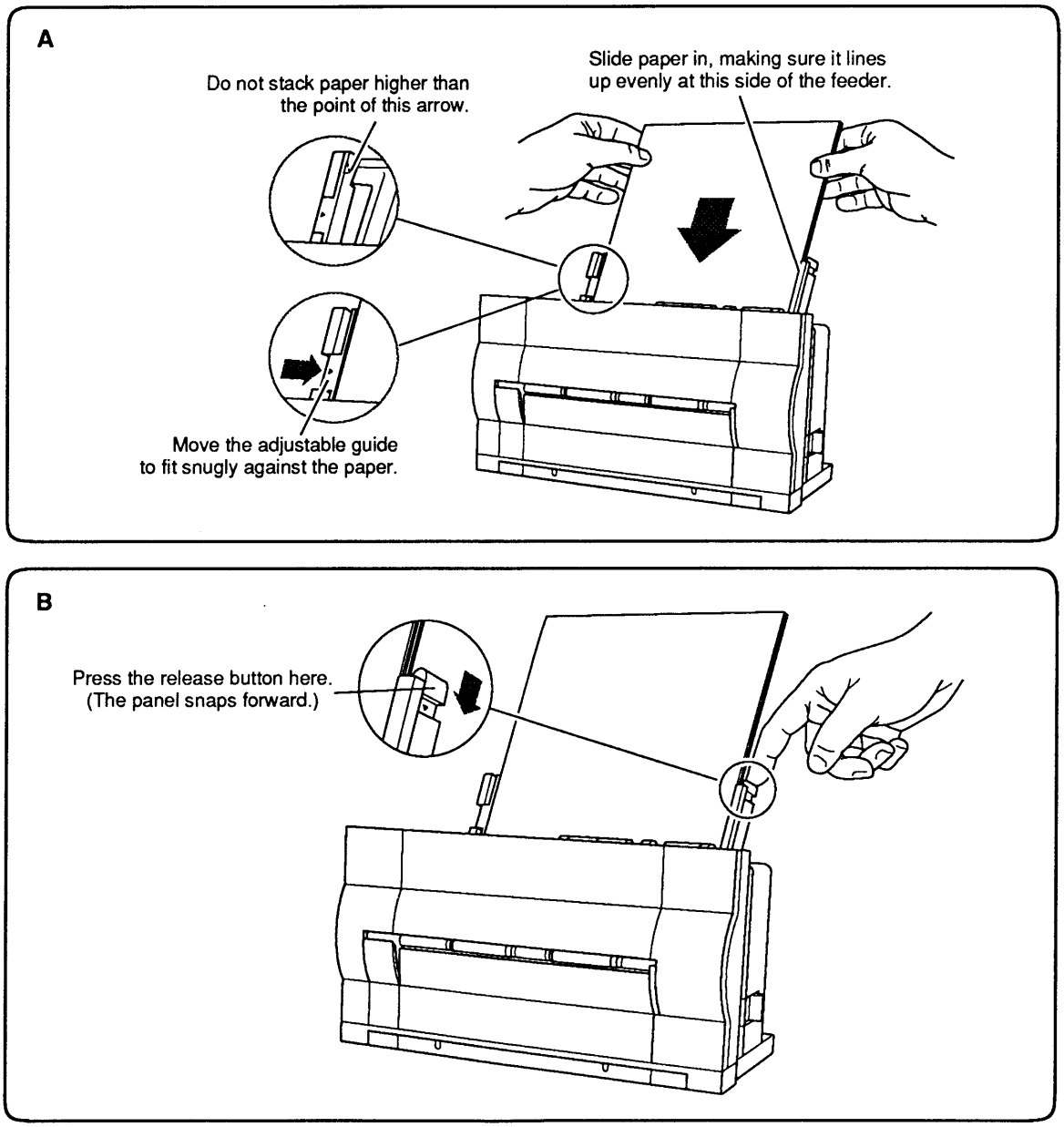


Figure 1-9 Loading Paper into the Cut Sheet Feeder

Manual Feed For Single Sheets (Using Front Slot)

1. Lower the manual feed tray.
2. In the Page Setup box (under the File menu), identify the size of paper you will be using.
3. Choose Print from the File menu and click **Manual** in the Print dialog box.
4. Press the Ready button to turn off the Ready light.
5. Insert the sheet of paper as far as it will go into the front slot of the printer. **(Figure 1-10)**.
6. Holding the paper positioned in the slot, press and release the Form Feed button. This action feeds the paper around the platen to the first print line.
7. Make sure the paper aligns correctly. If not, pull down the paper release lever, remove the paper from the slot, close the release lever, and repeat steps 5 and 6.
8. Press the Ready button to turn on the Ready light.
9. Click OK in the dialog box on your screen. The printing begins.

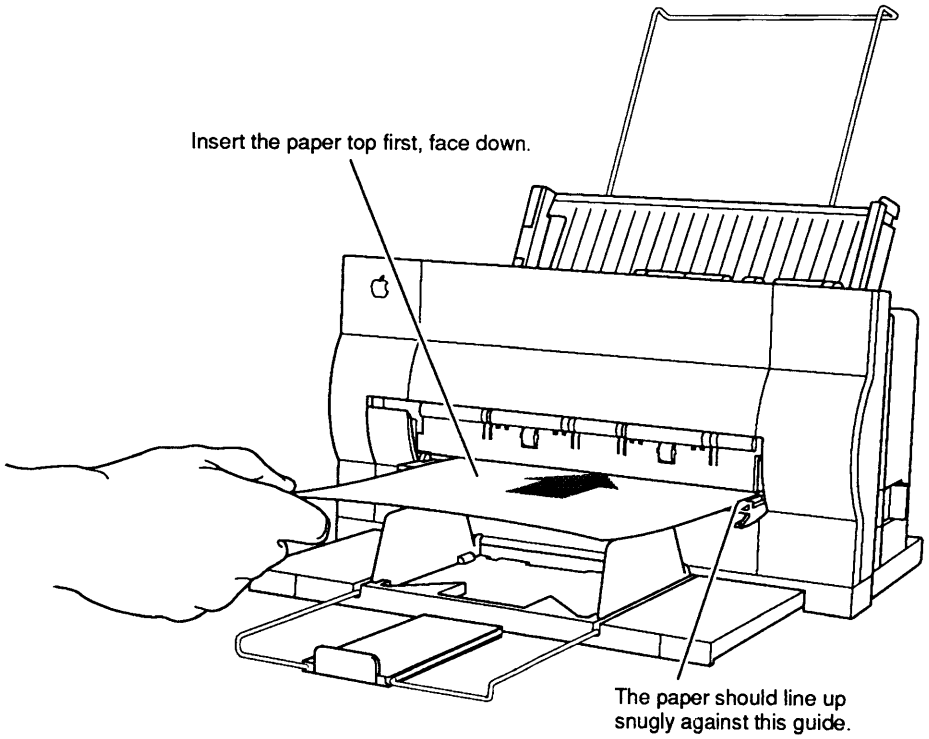


Figure 1-10 Manual Feed (Front Slot)

Manual Feed for Envelopes, etc. (Rear Slot)

1. Open the front access door and flip the forms thickness lever down. Close the front access door.
2. In the Page Setup box (under the File menu), identify the size of paper or envelope to be used.
3. Choose **Print** from the File menu and click **Manual** in the Print dialog box.
4. Press the Ready button to turn off the Ready light.
5. Insert the envelope, sheet of labels, heavy sheet, or transparency as far as it will go into the rear slot of the cut sheet feeder **(Figure 1-11)**. Insert envelopes top first, address side up. Insert sheets of labels, transparencies, or paper top first and face up. When the material is inserted far enough, the printer grasps the material and draws it in.
6. Make sure the paper aligns correctly. If not, pull down the paper release lever, remove the paper from the slot, close the release lever, and repeat step 5.
7. Press the Ready button to turn on the Ready light.
8. Click OK in the dialog box on your screen. The printing begins.

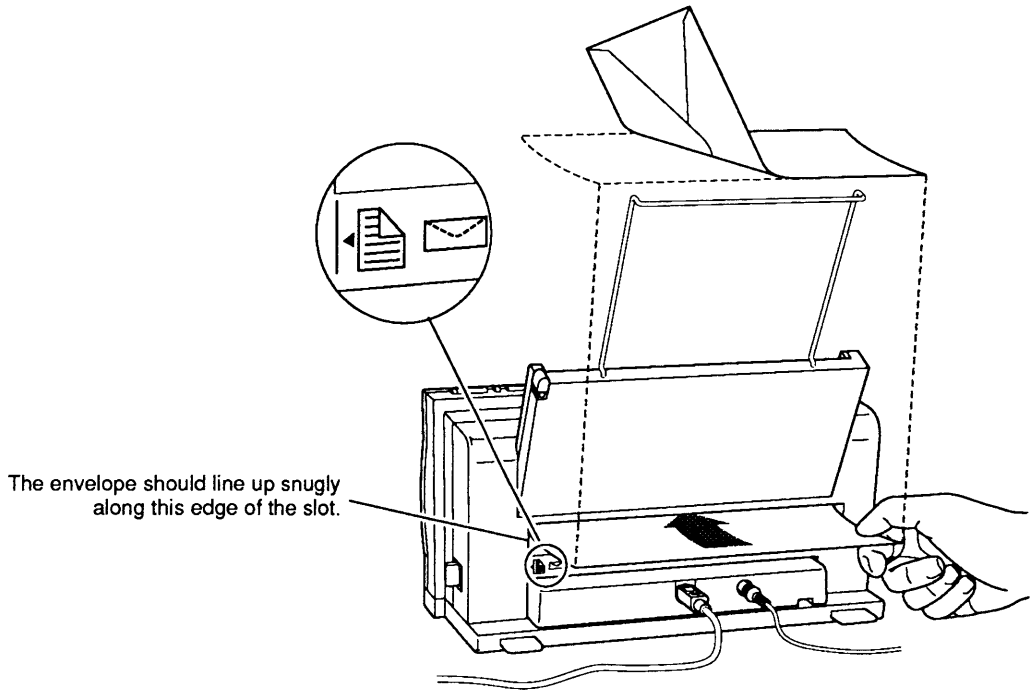


Figure 1-11 Manual Feed (Rear Slot)

❑ OPERATION PANEL

Figure 1-12 shows the operation panel, which contains the operating buttons and indicator lights.

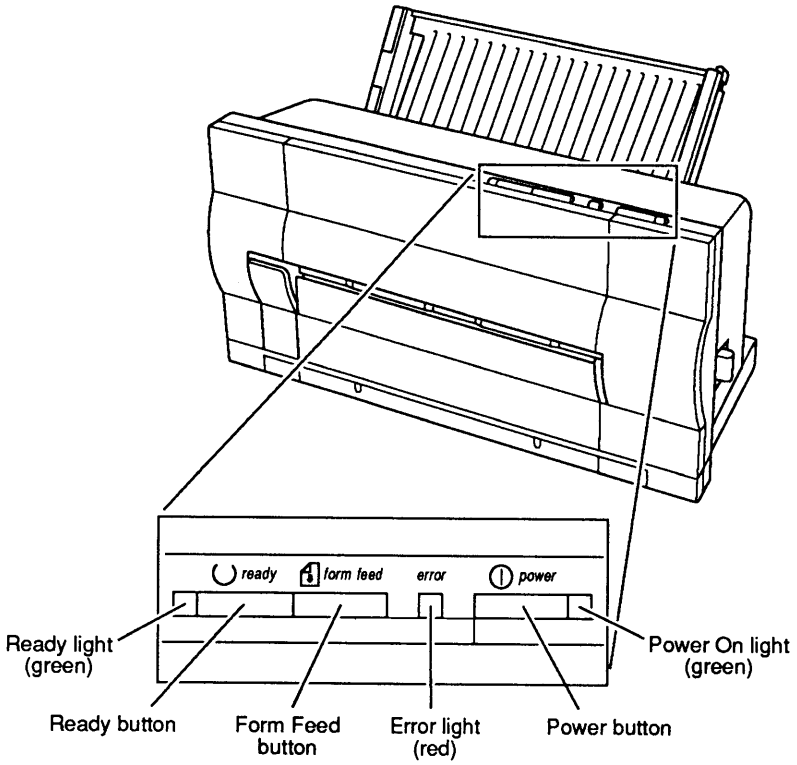


Figure 1-12 Operation Panel

Buttons

The operating buttons enable you to control the printer.

Power Button

The Power button switches the printer on and off.

Ready Button

The Ready button allows you to toggle between an on-line (ready) state and an off-line state. The Ready button also signals manual-feed printing.

Form Feed Button

The Form Feed button does not function unless the printer is in an off-line (deselected) state. When you press the Form Feed button, the printer feeds paper until the printer reaches the top of the next form.

Indicator Lights

The indicators are lights that let you know what state the printer is in.

Power

When lit, the green Power light indicates that power is on.

Ready

When the green Ready light is lit, the printer is on-line, in a ready state so that a transmission can take place. The Ready light is on during warm-up and while printing. If the Ready light is off, the printer is not ready to print.

Error

The red Error light has three ways of indicating an error condition in the printer:

- If the Error light shines steadily (and the Ready light goes off), the printer is out of paper.
- If the Error and Ready lights blink while the Power light remains steady, paper has jammed.
- If the Error light and Power light both blink (while the Ready light is off), the carriage (containing the ink cartridge) is jammed.

To ensure that the printer is not in an error condition, the printer driver performs a general reset of the printer before beginning each print job.

❑ POWER-ON, SELF-TESTS, AND TEST PRINTS

Power-On

1. Connect one end of the power cord to the printer and the other end to the AC adapter. Connect the AC adapter to the wall outlet.

CAUTION: *The AC adapter supplies 9.5 VDC to the printer. The AC adapter accommodates the voltage used in the geographical region to which the StyleWriter is shipped. Use only the AC adapter supplied with the printer and do not use the printer AC adapter for any other equipment. Be sure to tell customers that the AC adapters for the Macintosh Portable and the StyleWriter fit interchangeably, but their polarities are reversed.* ***The incorrect adapter will blow the input fuse on either device.***

2. Press the Power button.

3. Check the operations panel. Make sure the Power light comes on.

Logic and Serial Loopback Self-Tests

The printer performs an automatic logic self-test with every power-up; the flashing red Error light on the operations panel indicates an error.

The StyleWriter printer also performs a serial loopback test if you install a serial loopback plug on the serial port and follow the directions for performing the test print (below). If the serial communications are OK, the test print page prints. If not, the red Error light on the operations panel flashes.

User Test Print

The StyleWriter printer produces a user test print if you do the following:

1. Press and hold the Form Feed button.

2. Press the Power button once, and then release both the Form Feed and the Power button at the same time.

The test print is not really a test—it is simply a visual aid in determining print quality. If the power-up logic test and the serial loopback test (if performed) pass, the test print page will print.

Print Quality Test Print

A second test print for print quality is available to the servicing technician. This print allows you to diagnose specific problems with the ink jets. To obtain this test print, do the following:

1. Press and hold the Form Feed button and the Ready button.

2. Press the Power button once, and then release the Form Feed, the Ready, and the Power button at the same time.

Figure 1-13 shows (smaller than actual size) a reproduction of the test quality print. The numbers on the reproduction (which do not appear on the test print) are useful in diagnosing the following:

- Nozzle position – Look for straight columns and an even diagonal line.

- Extraneous dots – Look between the bars for extraneous printing.

- Nozzle position – Look for missing or misplaced dots. Each cluster contains 64 dots (one from each nozzle); the line represents one pass across the paper.

- Nozzle position – Look for straight, parallel columns and even column divergence.

- Optical density – Look for white lines across the bars, which could indicate a clogged or misplaced nozzle.

- Nozzle and print head position – Look for straight, parallel lines and uniformity and squareness in the boxes. Skewness can indicate either print head misalignment or faulty nozzles, depending on the scale of the skew.

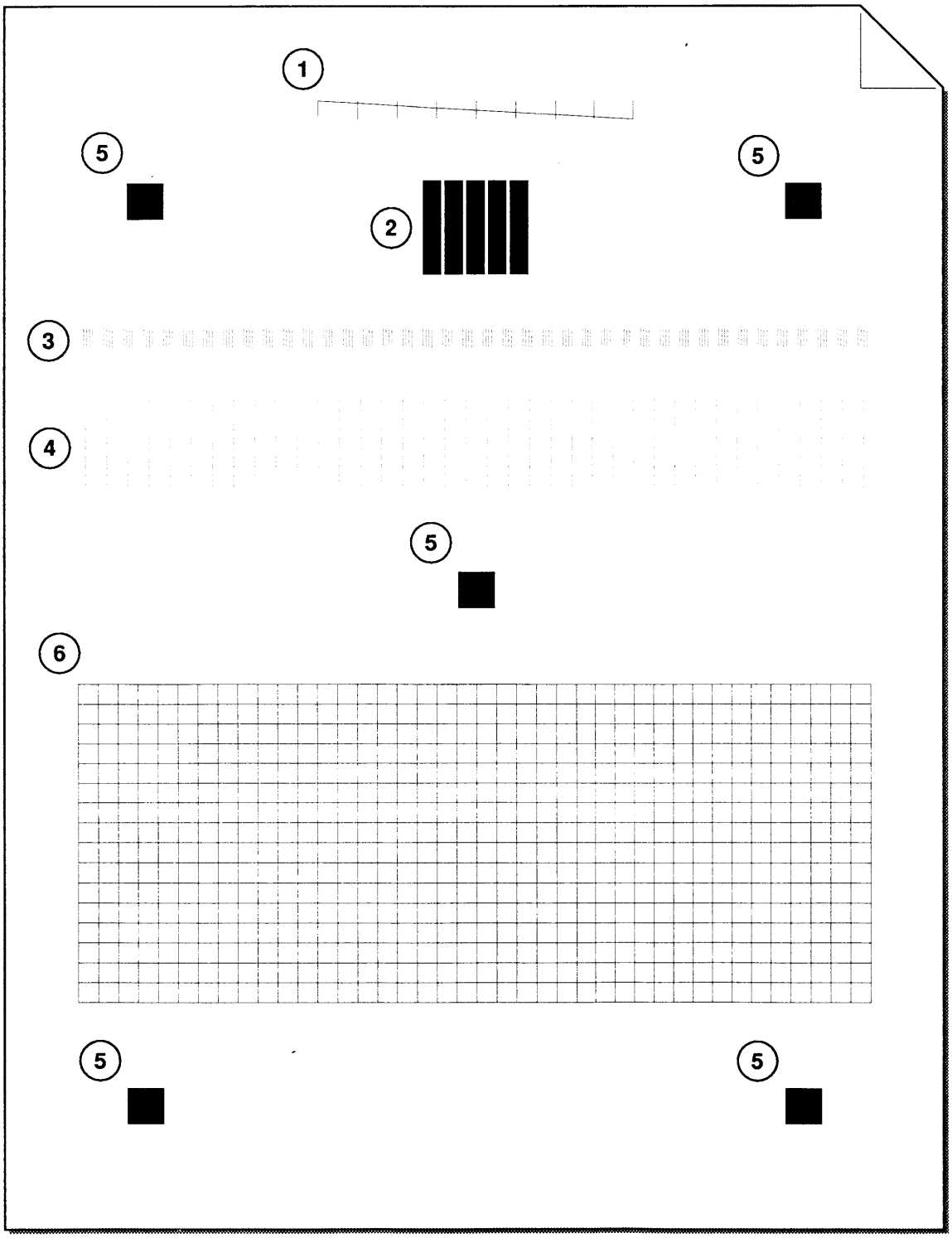


Figure 1-13 Print Quality Test Print

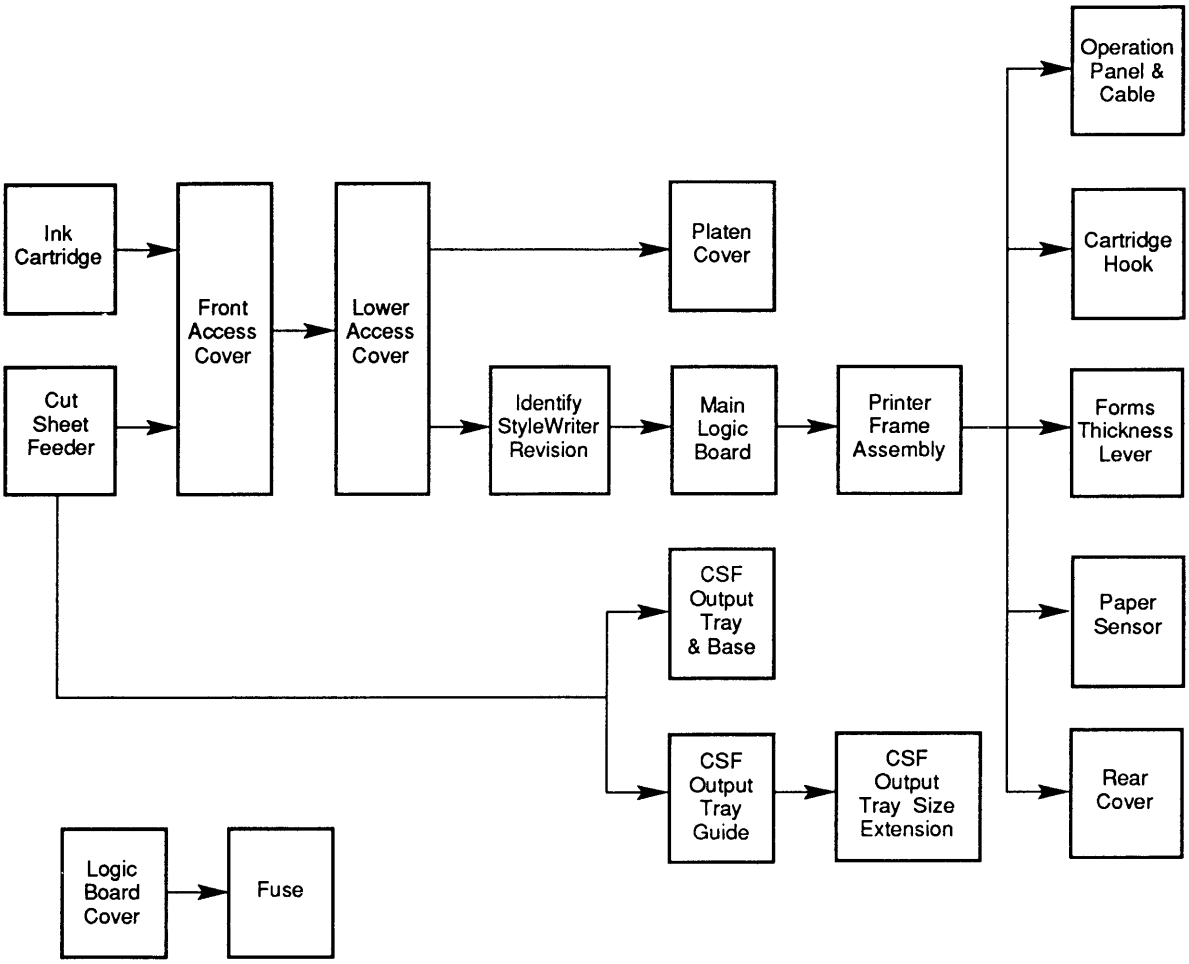
Apple Technical Procedures

StyleWriter

Section 2 – Take-Apart

❑ CONTENTS

Note: If a step is underlined, detailed instructions for that step can be found elsewhere in this section.



StyleWriter Take-Apart Flowchart

❑ INTRODUCTION

About This Section

The flowchart on the left has a left-to-right, top-to-bottom flow. The chart is designed so that you can see quickly what modules have to be removed before you can work on the module you want.

If a step is underlined in the procedures that follow, detailed instructions for that step can be found in other procedures in the section. You will have to refer to the earlier procedures and remove those modules before you can continue.

The materials required for the entire take-apart are listed below. This list will give you an idea of what tools you need when taking apart the StyleWriter printer.

The graphics are designed to give you maximum assistance. When you look at the graphics, pay attention to details, captions, and arrows.

Materials Required

Magnetized #2 Phillips screwdriver
Small, flat-blade screwdriver
Precision (jeweler's) flat-blade screwdriver set
Tweezers (optional)
Grounded workbench pad
Grounding wriststrap

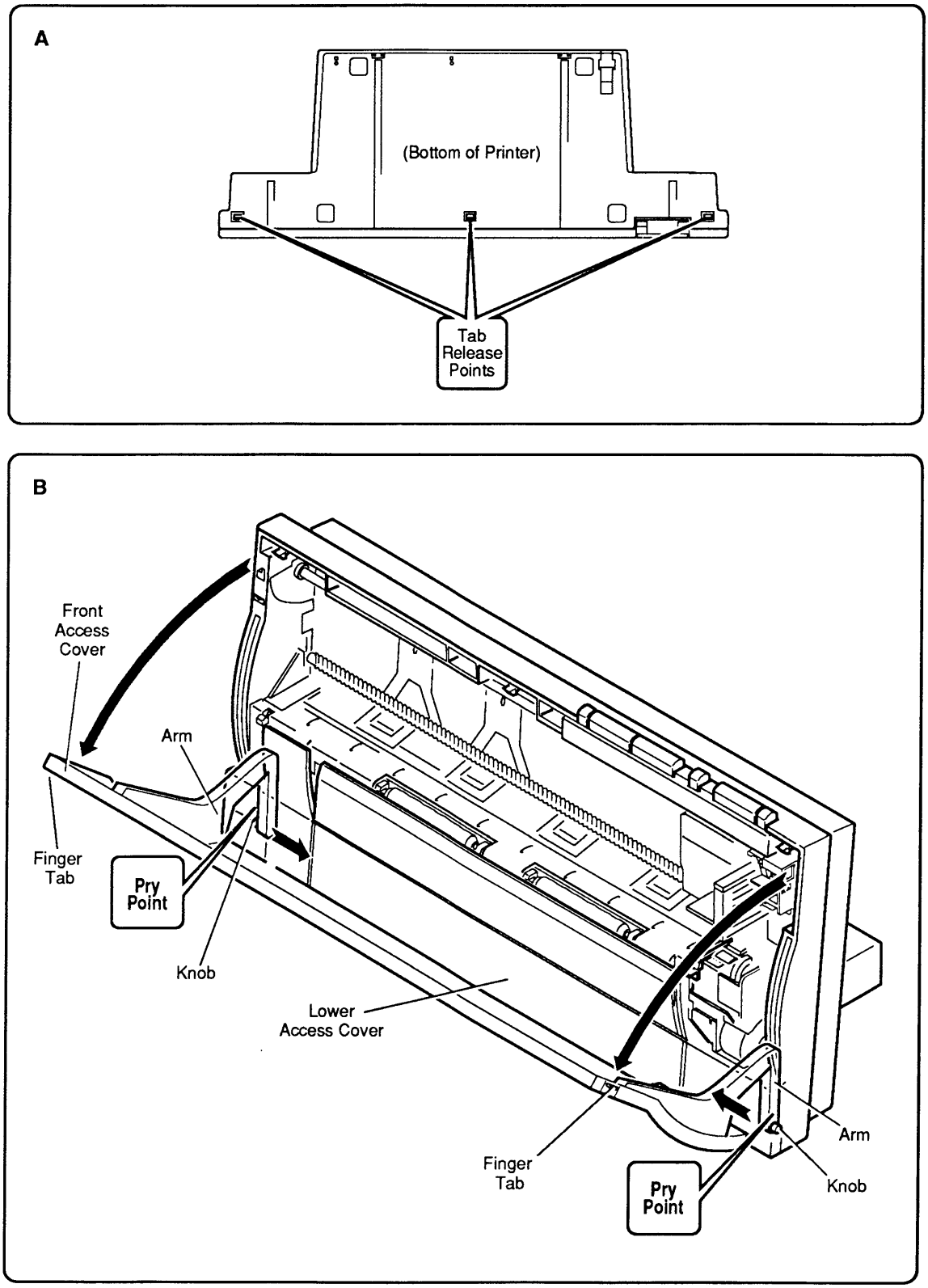


Figure 2-1 Front Access Cover

❑ FRONT ACCESS COVER

CAUTION: *The StyleWriter printer is built with many plastic parts. Be careful not to bend or break any of the plastic tabs when taking apart the printer. Most of the plastic parts are made of a hard plastic that contains glass fiber, and the viscosity is low to increase the precision of the tooling. As a result, the plastic tabs are easy to break. Use precision screwdrivers or tweezers for take-apart and do not apply excessive force when releasing a tab.*

Remove

1. Before taking apart the StyleWriter, remove the ink cartridge (if present) and separate the printer from the cut sheet feeder (see Section 1, Basics).

2. Turn the printer so that you can see the bottom. Using a small, flat-blade screwdriver, release the three tabs along the bottom of the rear cover (**Figure 2-1A**). Releasing these tabs will loosen the lower access cover enough for you to remove the upper (front access) cover more easily. (Don't try to remove the lower access cover yet—you will do that in the procedure on the following page.)

3. Open the front access cover by pushing out on the finger tabs at the two upper corners (**Figure 2-1B**). You will see that the front access cover is held in place by two arms that function as hinges. Plastic knobs at the end of the arms fit into holes on the inside of the rear cover. Using a small, flat-blade screwdriver, press the end of each arm in (toward the center of the printer) to free the arm's knob from the hole in the rear cover (**Figure 2-1B**).

4. When both arms are free of the rear cover, lift off the front access cover.

Replace

1. Be sure the lower access cover is in place, but with the lower tabs loose (as directed in step 2 above).

2. Slide the two front access cover arms down into the rear cover until the knobs snap into their corresponding holes on the rear cover (**Figure 2-1B**).

3. Snap down the lower access cover tabs (**Figure 2-1A**).

4. Replace the customer's ink cartridge.

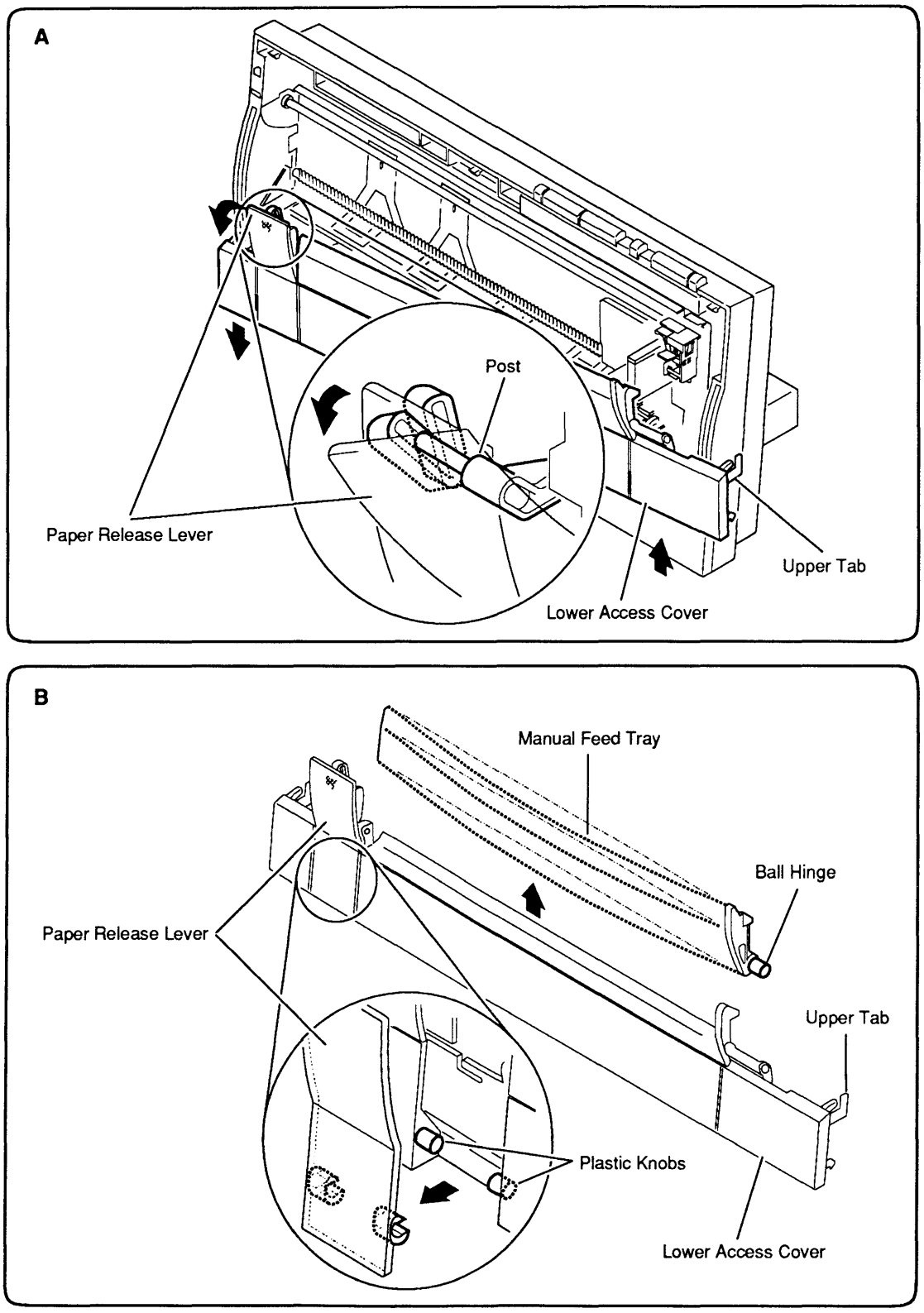


Figure 2-2 Lower Access Cover

❑ LOWER ACCESS COVER

This procedure includes instructions for replacing the lower access cover, the paper release lever, and the manual feed tray.

Remove

1. Remove the front access cover.
2. In removing the front access cover, you loosened the three tabs that hold the lower access cover in place on the bottom of the printer. Now maneuver the lower access cover free at the upper tabs (**Figure 2-2A**).
3. The lower access cover is now free except at the paper release lever. Pull the paper release lever down as far as it will go. Angle the paper release lever so that you can slip it off the paper release post on the frame (**Figure 2-2A**).
4. If you need to remove the paper release lever from the lower access cover, rotate the lever away from the cover until the lever's plastic hinges can be freed from the holders on the lower access cover. (**Figure 2-2B**).
5. If you need to remove the manual feed tray, simply flex it enough to free its plastic hinges from the lower access cover (**Figure 2-2B**).

Replace

1. If you removed the paper release lever and/or the manual feed tray, replace them by slipping their plastic ball hinges into place on the lower access cover (**Figure 2-2B**).
2. Angle the paper release lever (now attached to the lower access cover) over the post on the frame (**Figure 2-2A**).
3. Snap the upper tabs of the lower access cover into the frame (leave the lower tabs loose to make replacement of the front access cover easier).
4. Close the paper release lever (**Figure 2-2A**).
5. Replace the front access cover (in that procedure you are instructed to snap down the bottom tabs of the lower access cover).

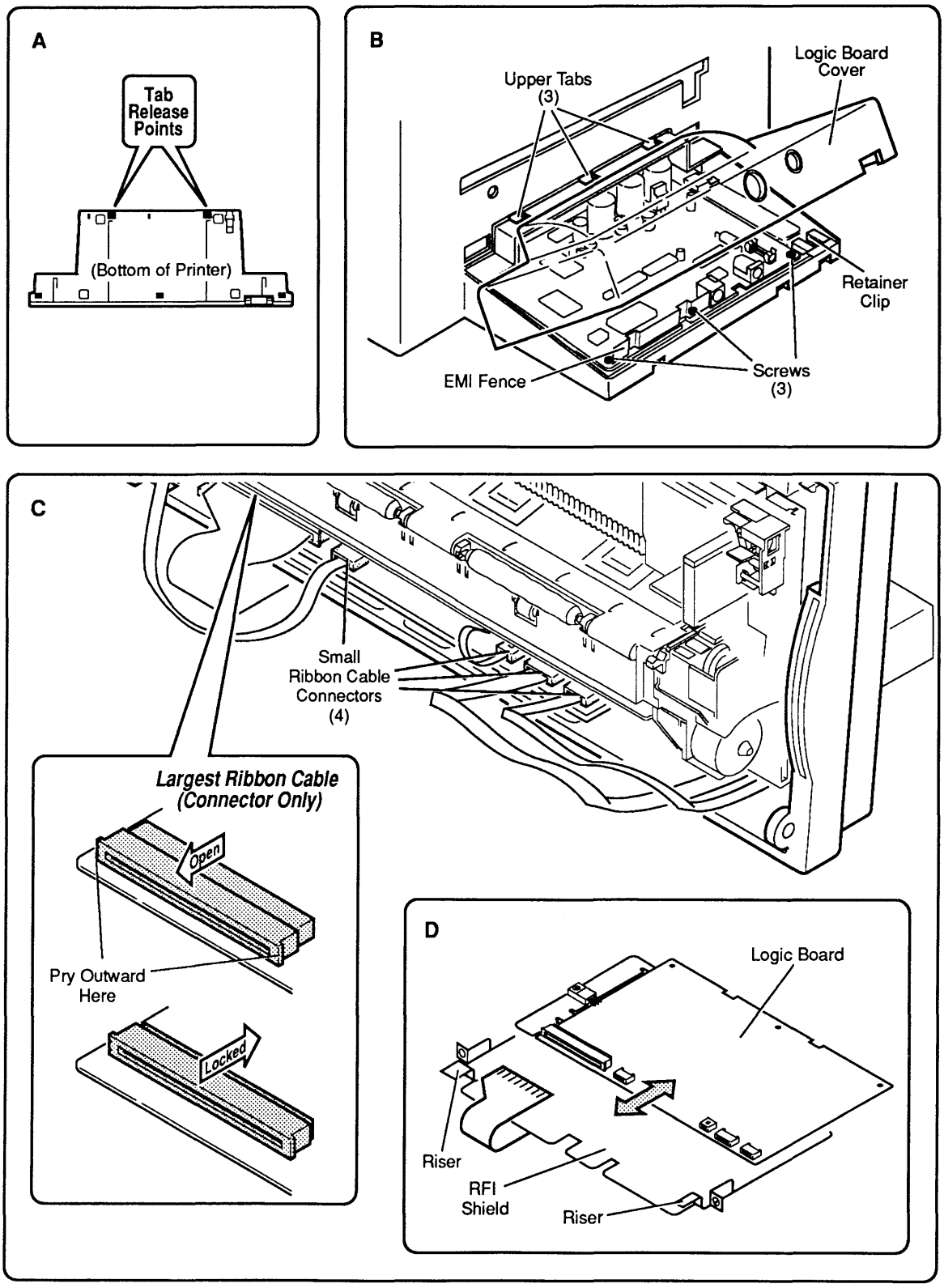


Figure 2-3 Main Logic Board

❑ MAIN LOGIC BOARD

Remove

1. Remove the front access cover and lower access cover. Identify StyleWriter rev. A or rev B.

CAUTION: *See "StyleWriter Revision Identification" later in this section to identify StyleWriter revisons.*

2. Release the two lower tabs that secure the logic board cover to the printer bottom (**Figure 2-3A**).

3. Lift the rear of the logic board cover and free the cover at its upper tabs (**Figure 2-3B**).

CAUTION: *In the following steps, you will disconnect five fragile ribbon cables.* ***Handle cables with great care and do not disconnect them except when necessary.***

4. Disconnect the four small ribbon cables from the logic board by pulling gently on the tab ends (**Figure 2-3C**).

5. To disconnect the largest connector, slide the front half of the connector toward you to unlock the connector. Gently pull out the cable (**Figure 2-3C**).

6. Remove the three screws at the rear of the logic board (**Figure 2-3B**), set aside the EMI fence, and slide the logic board out of the frame from the rear. Be sure not to lose the retainer clip.

Replace

1. Slide the logic board into place from the rear of the printer. Be sure the front edge of the logic board rests on top of the risers at the front edge of the metal RFI shield (**Figure 2-3D**).

2. Align the screw holes on the rear of the logic board with the screw holes on the RFI shield and on the bottom cover. Place the two holes of the EMI fence over the two left holes of the logic board, as shown in **Figure 2-3B.** Replace the three screws.

3. Open the largest ribbon cable connector by sliding the front half of the connector toward you. Insert the ribbon cable into the connector so that the cable's metal contact points are pointing up. To lock the cable in place, push the front half of the connector back (**Figure 2-3C**).

4. Tuck the fold of the large ribbon cable under the RFI shield (**Figure 2-3D**).

5. Insert the four remaining ribbon cables into their connectors on the logic board (**Figure 2-3B**). Be sure the metal contact points are visible on the upper side and that the paper tabs are facing down.

6. Turn the printer so you can see the logic board. Check to be sure the retainer clip is in place.

7. To replace the logic board cover, insert the top three tabs into their holes on the back of the rear cover (**Figure 2-3B**). Push down on the logic board cover until the bottom tabs snap into place.

8. Replace the lower access cover and front access cover.

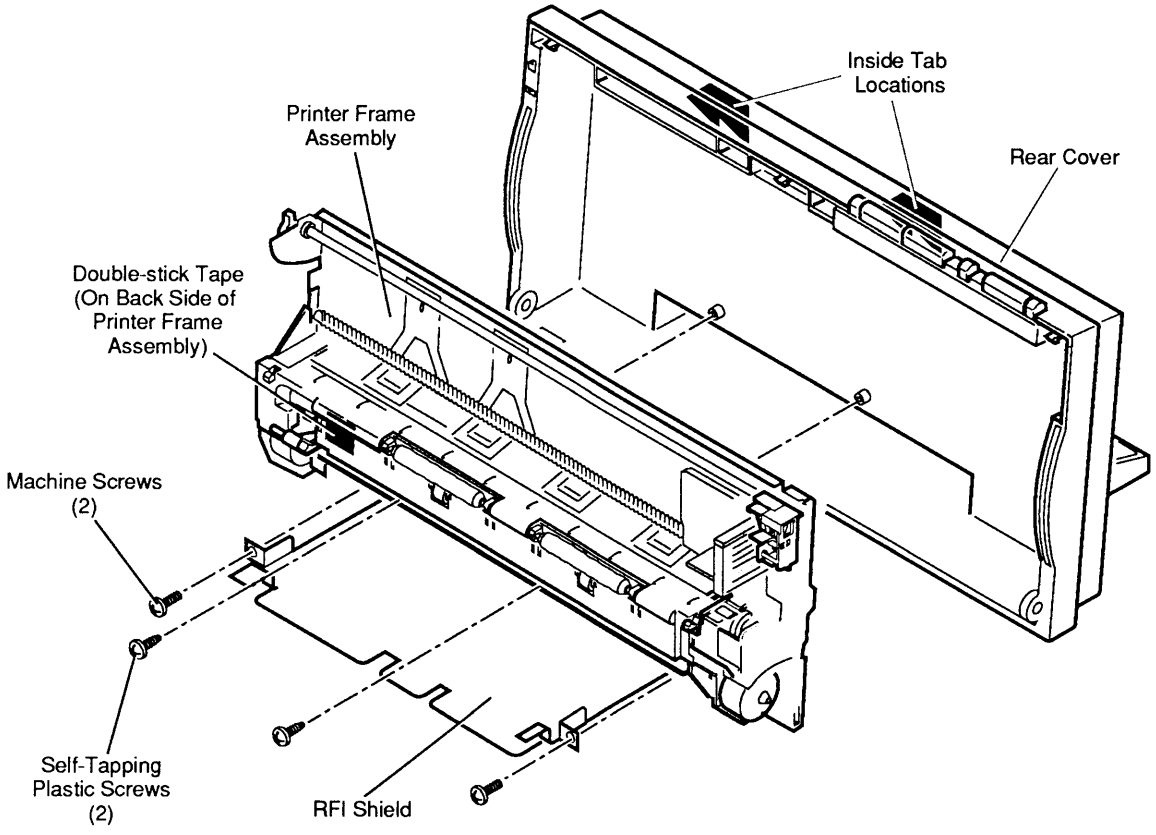


Figure 2-4 Printer Frame Assembly

❑ PRINTER FRAME ASSEMBLY

Remove

1. Remove the front access cover and lower access cover, identify the StyleWriter revision, and remove the main logic board.

CAUTION: *Printer frame assemblies for StyleWriter Revisions A and B are not interchangeable. See "StyleWriter Revision Identification" later in this section.*

2. Remove the four screws that secure the printer frame assembly to the rear cover (**Figure 2-4**).

3. Slide the RFI shield from the front of the printer. Take care that the retainer (security) clip at the rear corner of the bottom cover does not fall out. (see **Figure 2-3B** on the previous page).

4. Lift the printer frame assembly down and out to free it from the tabs on the upper inside of the rear cover (**Figure 2-4**).

IMPORTANT: *The printer frame assembly comes with the platen cover, paper sensor, cartridge hook, and forms thickness lever installed, so do not remove these parts prior to returning a printer frame to Apple.*

Replace

Note: Ribbon cables on replacement printer frame assemblies are taped to the assembly for shipping. Remove the tape carefully and press the cable onto the double-stick tape in the bottom-left corner of the assembly (**Figure 2-4**).

1. Slide the printer frame assembly up into the rear cover so that the metal top of the frame fits behind the plastic tabs on the top inside of the cover (**Figure 2-4**). Make certain that the connector ends of the operations panel cable and paper sensor cable are visible and hanging freely below the assembly.

2. Slide the RFI shield into place from the front of the printer (**Figure 2-4**). Route the large ribbon cable under the RFI shield and out the front.

3. Align the two screw holes on the printer frame with the two screw holes on the RFI shield and the two screw holes on the rear cover. Replace the four screws (**Figure 2-4**).

4. Replace the main logic board, lower access cover, and front access cover.

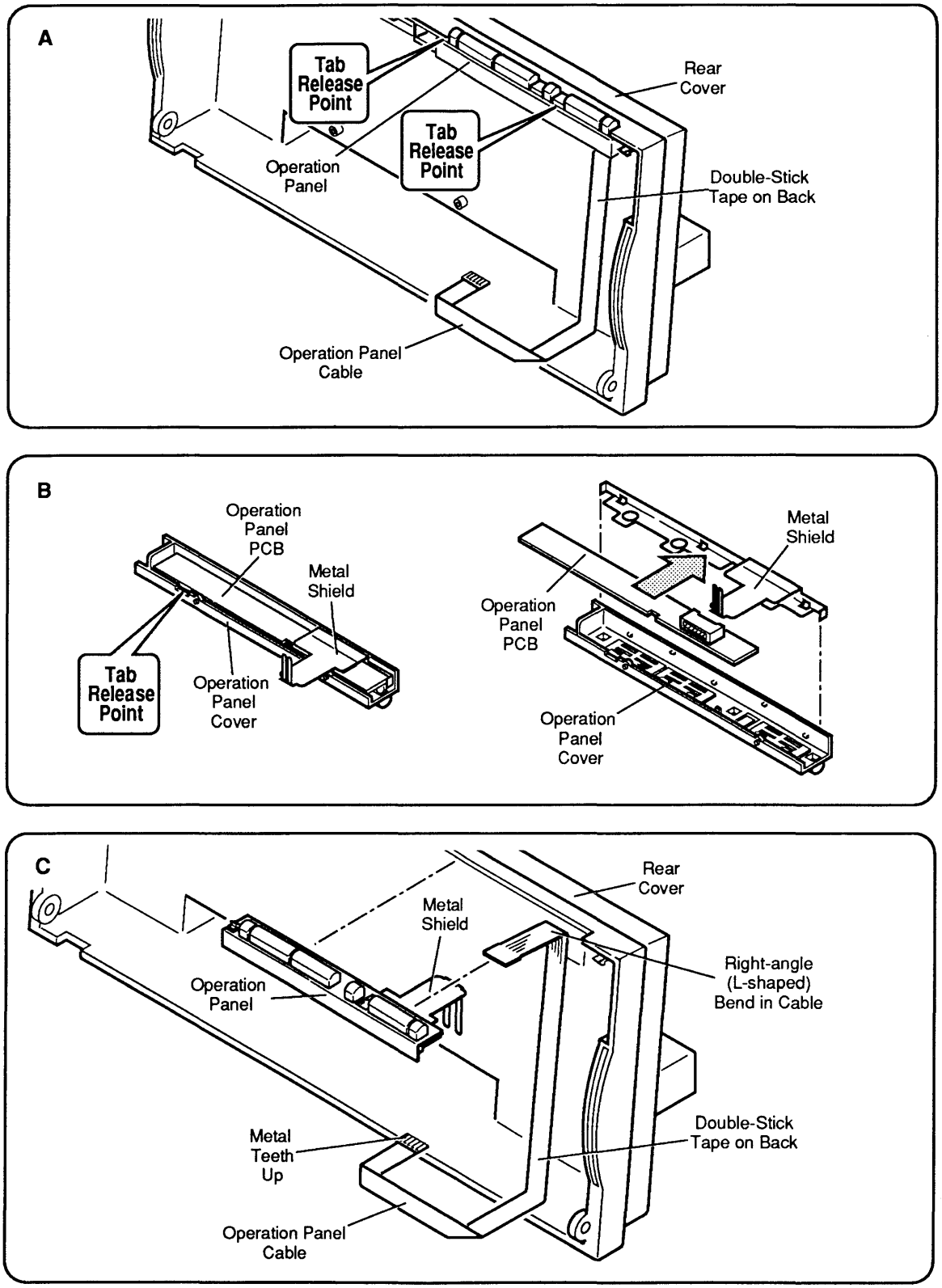


Figure 2-5 Operation Panel Assembly and Cable

❑ OPERATION PANEL ASSEMBLY AND CABLE

The operation panel assembly includes the panel cover (with buttons) and the PCB. The metal shield and the operation panel cable are available separately.

Remove

1. Remove the front access cover, lower access cover, main logic board, and printer frame assembly.
2. Pull up carefully on the ribbon cable, which is fastened to the inside of the printer rear cover with double-stick tape (**Figure 2-5A**).
3. Using a precision screwdriver (and being careful not to mar the plastics), release the two tabs that hold the operation panel assembly to the printer rear cover (**Figure 2-5A**). Slide the operations panel toward you to free it from the printer rear cover.
4. To remove the operations panel cable, pull gently on the cable connector to free it from its connector.
5. To remove the metal shield, turn the assembly over so that you can see the PCB on the bottom (**Figure 2-5B**). Release the tabs that hold the PCB to the cover and lift out the PCB and the metal shield.

Replace

1. Replace the metal shield in the operations panel assembly cover as shown in **Figure 2-5B**. Then slide the PCB into place on the bottom of the cover and press down until you hear the tabs snap into place.
2. To replace the operation panel cable, determine which end of the cable has a right-angle (L-shaped) bend about 1 inch from the connector—connect that end to the connector on the panel (the L-shaped bend fits into the top inside of the printer rear cover as shown in **Figure 2-5C**). Be sure that the metal teeth of the connector face the bottom side of the connector and that the colored plastic faces up.
3. Remove the protective strip from the double-stick tape. Press on the cable to adhere the double-stick tape to the rear cover. Be sure the cable has sufficient "play" at the right-angle (L-shaped) fold so that the printer frame does not put stress on the cable when the frame is reinstalled (**Figure 2-5C**).
4. Replace the printer frame assembly, lower access cover, and front access cover.

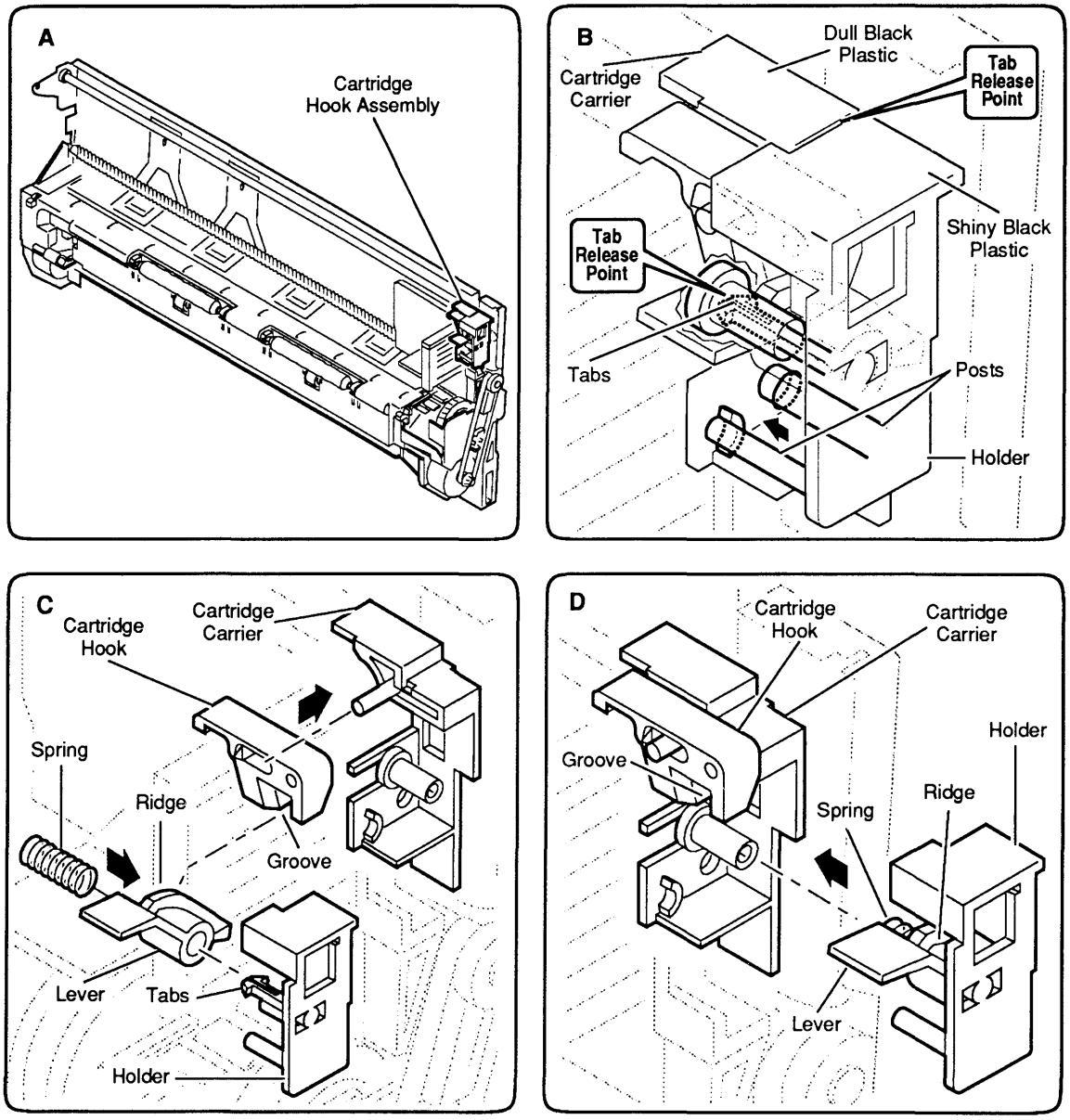


Figure 2-6 Cartridge Hook

❑ CARTRIDGE HOOK

The cartridge hook assembly kit contains the cartridge hook, lever, spring, and holder.

Remove

1. Remove the front access cover, lower access cover, main logic board, and printer frame assembly.

2. Place the printer frame assembly on a padded surface (take care not to crumple the ribbon cables under the frame).

3. Look carefully at the cartridge hook assembly in the upper-right corner of the printer frame assembly (**Figure 2-6A**). Note how the lever and the cartridge hook are positioned in the assembly. Move the lever up and down and watch the cartridge hook operate. Also note that the plastic of the cartridge hook holder is glossy black; the plastic of the adjacent carrier is a dull black (**Figure 2-6B**).

4. Using a precision screwdriver, gently pry between the top of the cartridge hook holder and the adjacent plastic of the cartridge carrier at tab release point **#1** (**Figure 2-6B**). Push the cartridge hook holder toward the right edge of the printer frame. Insert small tweezers into the cartridge carrier post at tab release point **#2** and gently squeeze the tips of the lower tabs inward to release the tabs from the inside of the post.

5. When the cartridge hook holder is loose, pull it off the frame. The four pieces of the cartridge hook assembly (the holder, spring, lever, and hook) will fall into your hand.

Replace

1. Assemble the cartridge hook assembly pieces as shown in **Figure 2-6C**: put the cartridge hook on its post on the cartridge carrier and put the lever and the spring over the central post of the holder.

2. Slide the cartridge hook assembly into place on the cartridge carrier as you mesh the ridge on the lever with the groove on the bottom of the cartridge hook (**Figure 2-6D**). Be sure the assembly snaps securely into place on the carrier.

3. Replace the printer frame assembly, main logic board, lower access cover, and front access cover.

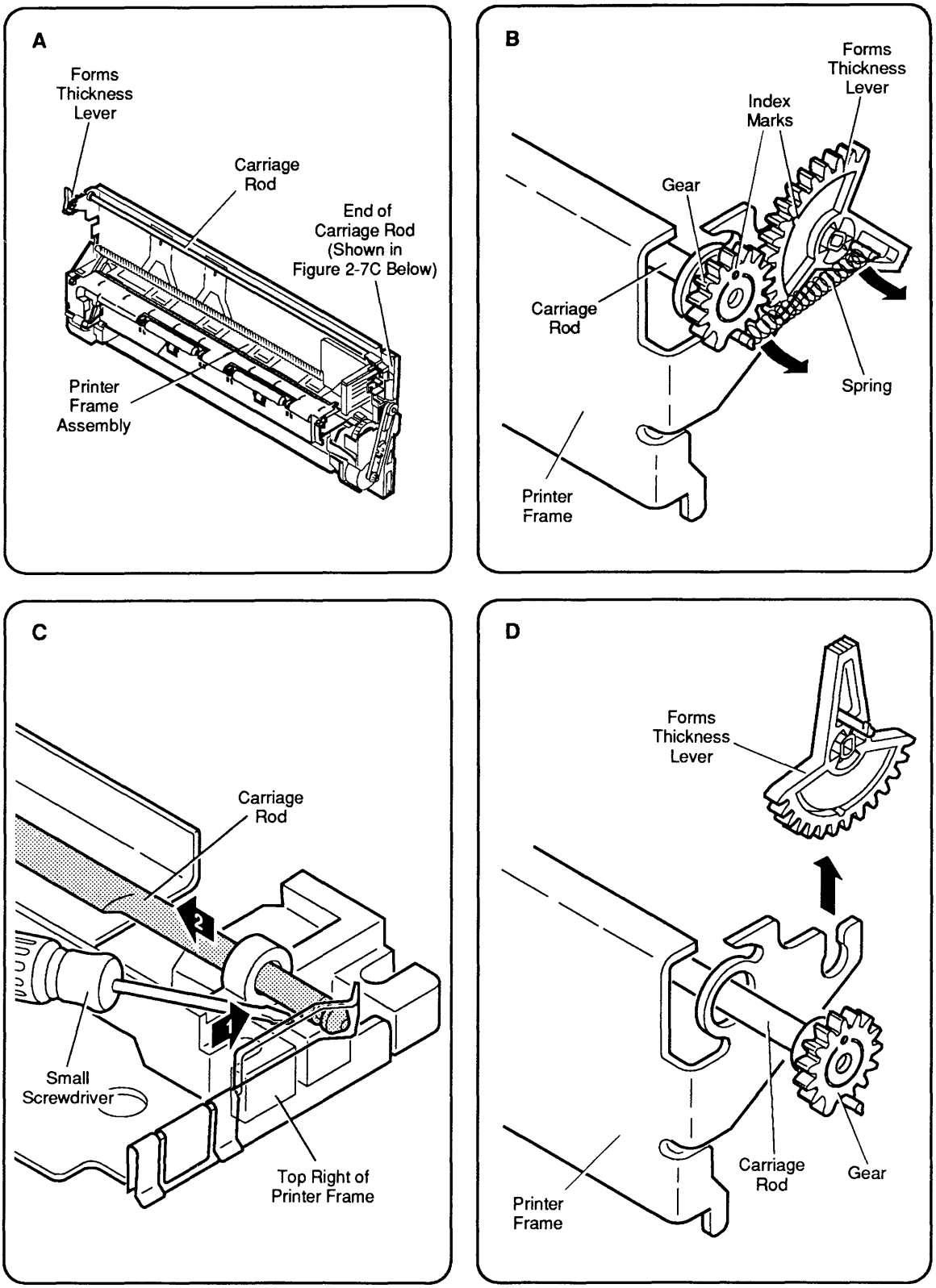


Figure 2-7 Forms Thickness Lever

❑ FORMS THICKNESS LEVER

The forms thickness lever kit contains the forms thickness lever and its spring.

Remove

1. Remove the front access cover, lower access cover, main logic board, and printer frame assembly.

2. Place the printer frame assembly on a padded surface, taking care not to crumple the ribbon cables under the frame.

3. Locate the forms thickness lever in the upper-left corner of the printer frame assembly (**Figure 2-7A**).

4. Remove the spring from the forms thickness lever (**Figure 2-7B**).

5. The forms thickness lever is actually a gear that meshes with a second gear to the rear; the second gear attaches to the carriage shaft that controls the distance of the ink cartridge from the paper. Observe how the two gears fit together. Note the gear index markings (dots) that align when the gears are in the middle of the range (**Figure 2-7B**). You will need to know how these markings line up so you can reassemble the gears correctly.

6. Now look at the other end of the carriage shaft (at the upper-right corner of the printer frame). The notch at the end of the shaft is secured in a tiny black plastic holder (**Figure 2-7C**). In this step, you are going to free the end of the shaft from the holder and push the shaft toward the other end of the printer frame assembly (toward the forms thickness lever) so that the gear attached to the shaft pushes past and separates from the forms thickness lever gear. To do this, use a precision screwdriver to push down on the black plastic holder while you push the shaft to the left (toward the forms thickness lever).

7. Now that the forms thickness lever is free of the rear lever, you can turn the forms thickness lever gear to its full UP or full DOWN position and slide it off the printer frame (**Figure 2-7D**).

Replace

1. Position the forms thickness lever in the full UP or full DOWN position and slide it onto the printer frame (**Figure 2-7D**).

2. Position the rear gear beside the forms thickness lever gear so that the index markings on the two gears line up (**Figure 2-7B**). Push the rear gear and the carriage shaft toward the right side of the printer frame so that the other end of the carriage shaft snaps into place in its black plastic holder (**Figure 2-7C**). Rotate the forms thickness lever up and down to be sure the gears are synchronized and work freely together.

3. Replace the spring (**Figure 2-7B**).

4. Replace the printer frame assembly, main logic board, lower access cover, front access cover.

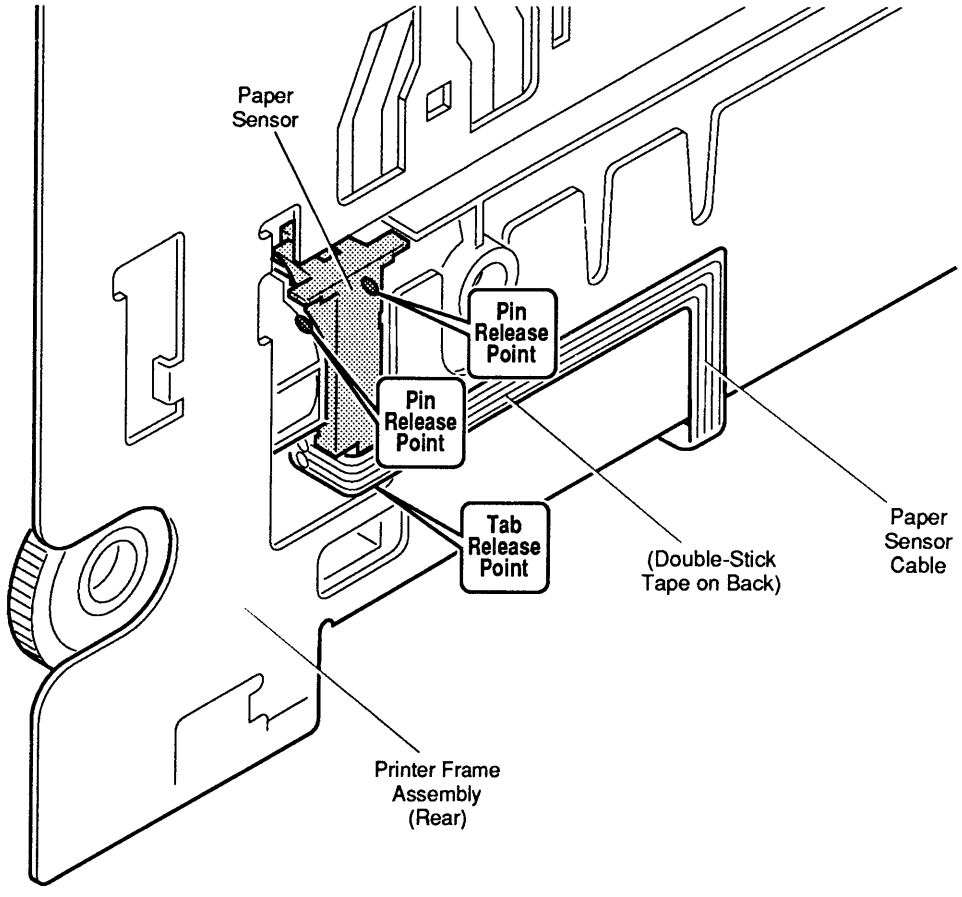


Figure 2-8 Paper Sensor

❑ PAPER SENSOR

The paper sensor is located on the rear of the printer frame assembly. The paper sensor cable attaches to the front of the logic board.

Remove

1. Remove the front access cover, lower access cover, main logic board, and printer frame assembly.

2. Turn the printer frame assembly over and locate the paper sensor (**Figure 2-8**). Note that the paper sensor cable is attached to the back of the printer frame with double-stick tape. Carefully peel the cable off the tape, but leave the tape in place on the metal frame.

3. Using a precision screwdriver, carefully release the tab at the bottom of the paper sensor. To loosen the pins that hold the top of the paper sensor in place, carefully insert your precision screwdriver between the paper sensor and the frame at the upper pin release points (**Figure 2-8**). When the paper sensor is free of the frame, lift the sensor out.

Replace

1. Snap the paper sensor into place on the rear of the printer frame assembly (**Figure 2-8**).

2. Route the paper sensor cable over the double-stick tape and press the cable down to secure it firmly to the tape.

3. Replace the printer frame assembly, main logic board, lower access cover, and front access cover.

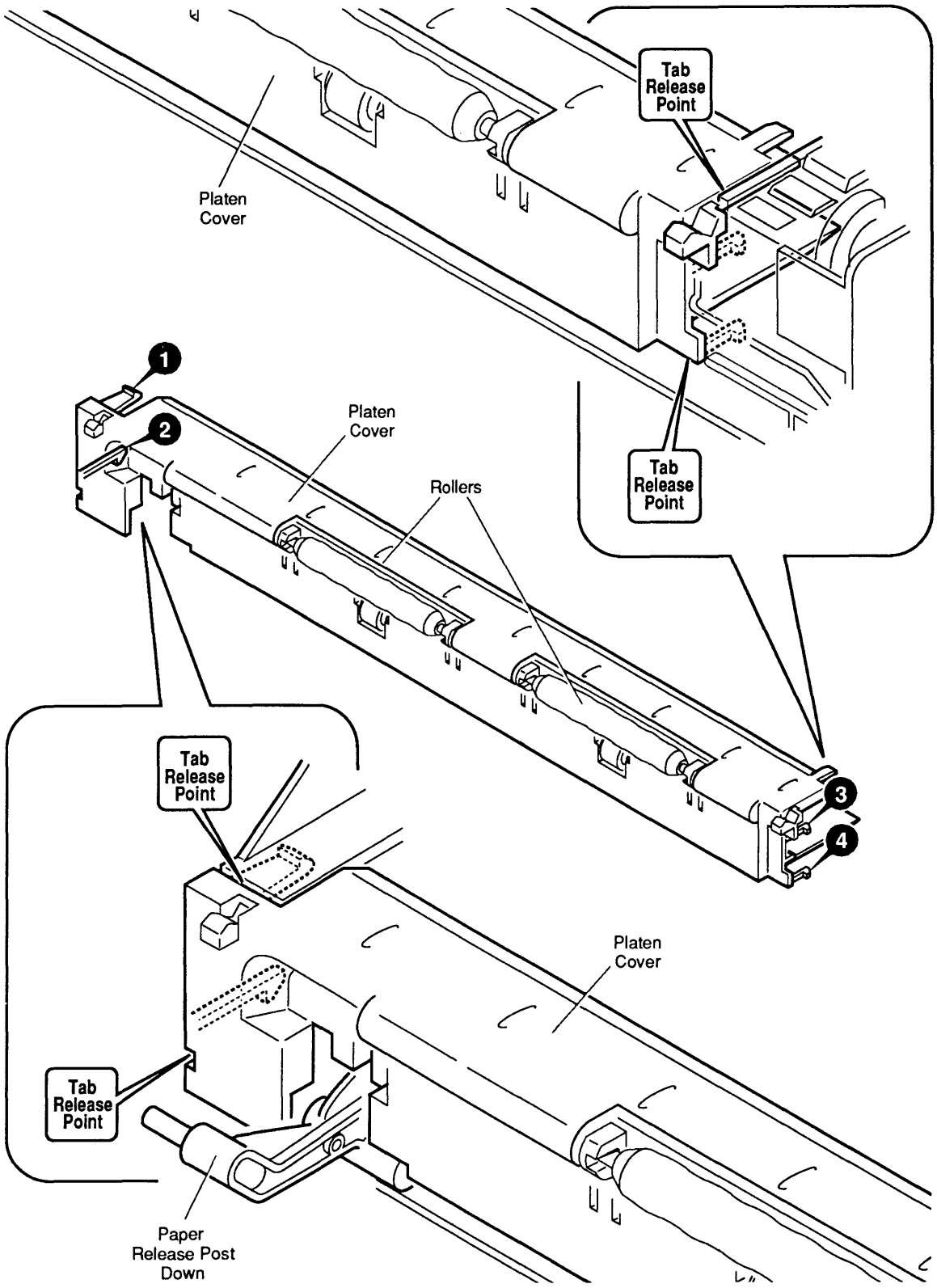


Figure 2-9 Platen Cover and Rollers

❑ PLATEN COVER AND ROLLERS

CAUTION: Removal of the platen cover is necessary only if it is broken and must be replaced—do not remove it in order to perform other take-apart procedures. *Removal of the platen cover is the most painstaking procedure in this section. The plastic tabs are hidden and tiny, and they break very easily.* ***Be very careful not to use force!***

Remove

1. Remove the front access and lower access covers.
2. Pull the paper release post down as far as possible.
3. Before going on, examine **Figure 2-9** to familiarize yourself with the placement of the four tabs (**#1**, **#2**, **#3**, and **#4**) that hold the platen cover in place, and the location of the tab release points on the printer frame (shown in the upper and lower closeups). Only the lower right tab (**#4**) is visible from the outside when the platen cover is in place.
4. Using a precision (jeweler's) screwdriver, **carefully** free the upper-left tab (**#1**) at the tab release point indicated in the lower figure closeup (**Figure 2-9**).
5. Place your screwdriver between the platen cover and the printer frame at the release point for the lower left tab (**#2**) and pry **gently** to free the tab.
6. Now lift up and rotate the cover slightly to free the upper and lower right tabs (**#3** and **#4**)—at the other end of the platen cover—from the printer frame. Lift the platen cover free.

Replace

1. Be sure the paper release post is down.
2. Carefully move the platen cover into position over the platen and push down gently on the platen cover until the tabs snap into place.
3. Replace the lower access cover and front access cover.

Rollers

You need not remove the platen cover from the frame in order to replace a roller. Simply grasp the roller with your fingers and pull—its end tabs will slip out of the holes on the platen cover. To replace a roller, simply snap it into place on the platen cover.

❑ REAR COVER

Remove

1. Remove the front access cover, lower access cover, main logic board, printer frame assembly, and operations panel assembly and cable.

2. Remove the retainer (security) clip from the rear corner of the rear cover (**Figure 2-10A**). Save the retainer clip to install on the replacement rear panel.

Replace

1. Read the customer's original serial number from the label on the bottom of the old rear cover and record the number with indelible ink on the bottom of the new cover (**Figure 2-10B**).

2. Replace the customer's retainer (security) clip on the rear corner of the rear cover (**Figure 2-10A**).

3. Replace the operations panel assembly and cable, printer frame assembly, main logic board, lower access cover, and front access cover.

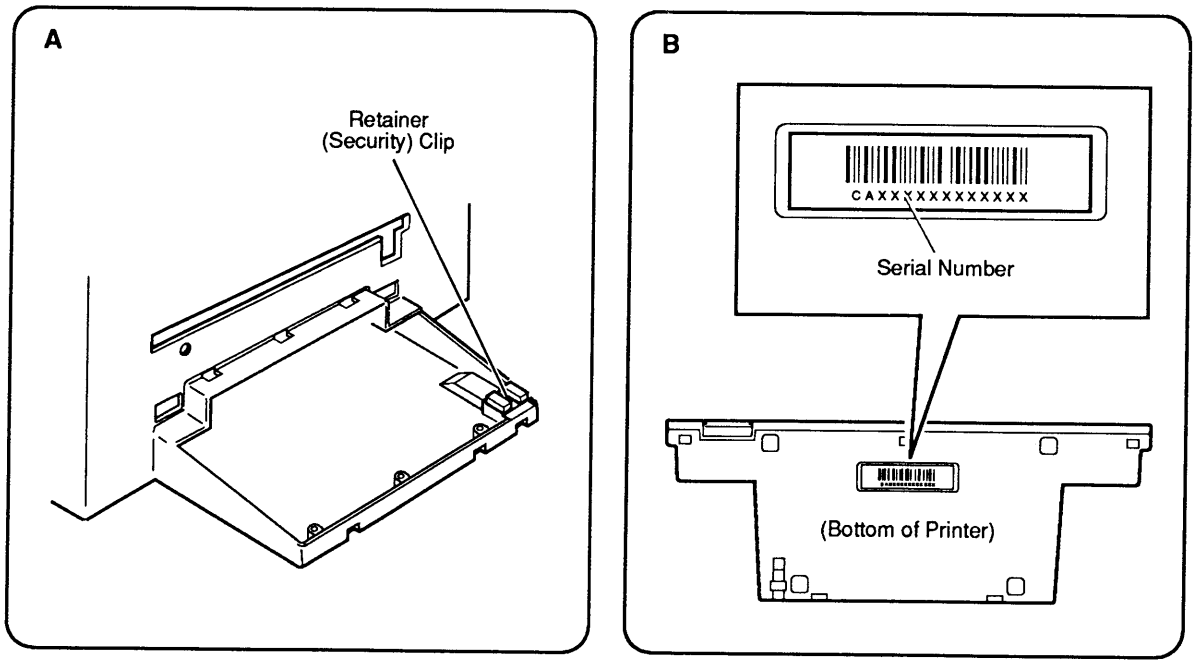


Figure 2-10 Rear Cover

❑ FUSE

Remove and Replace

1. Remove the main logic board cover.
2. Locate the fuse (**Figure 2-11**). Using a precision screwdriver, gently pry the ends of the fuse out of the holder.
3. Carefully snap the replacement fuse into the holder.

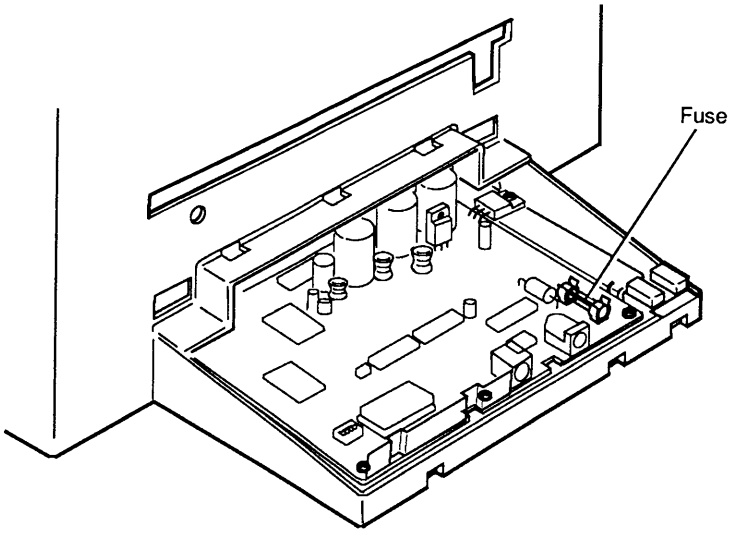


Figure 2-11 Fuse

❑ CUT SHEET FEEDER OUTPUT TRAY SIZE EXTENSION

Remove

1. Separate the cut sheet feeder from the printer (see Section 1, Basics).
2. Open the output tray on the cut sheet feeder and tip up the extension so that you can see the underside (**Figure 2-12**).
3. Using a precision screwdriver, lift up the tabs on the extension guide and slide the size extension out.

Replace

– Slide the new size extension into the extension guide until the tabs snap into place.

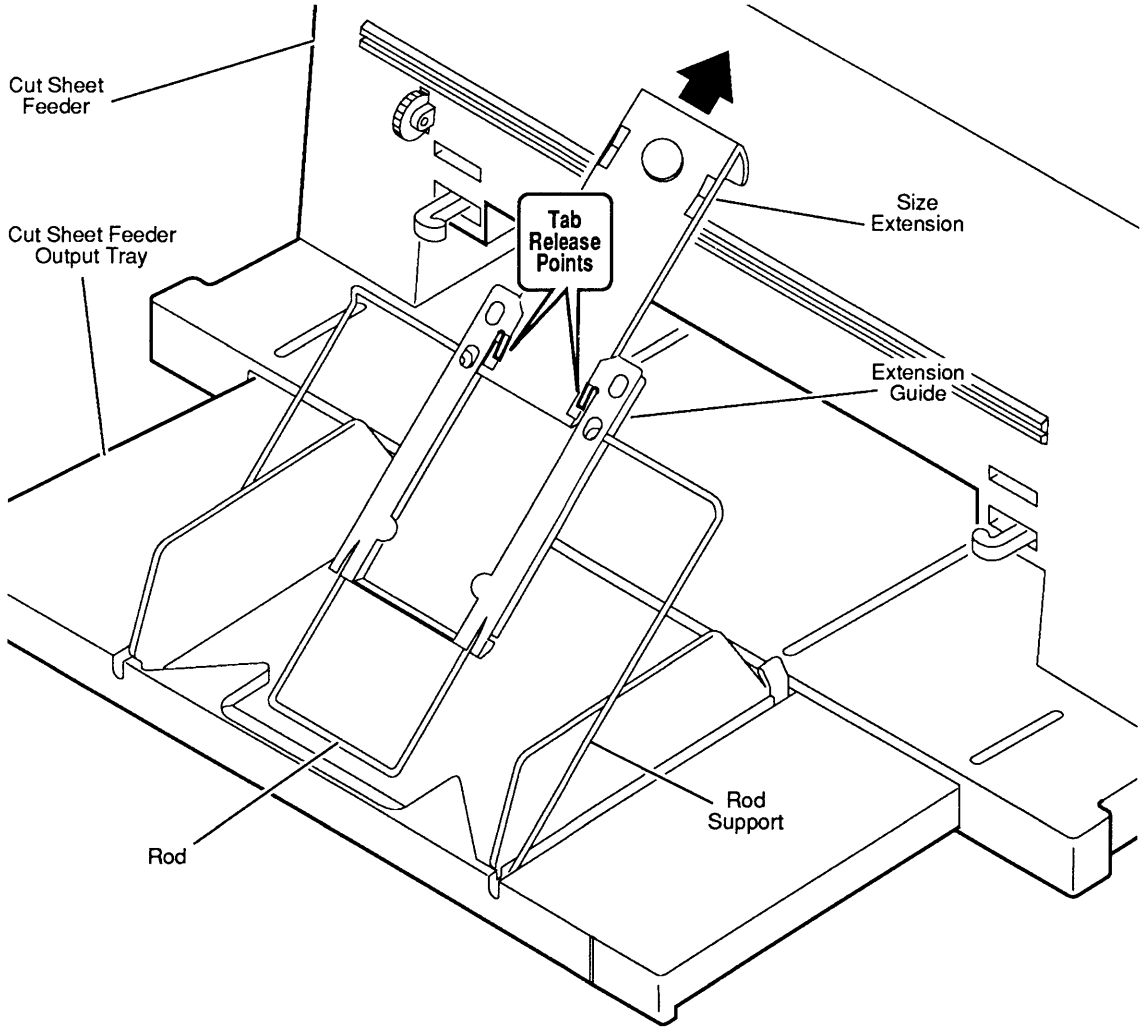


Figure 2-12 Output Tray Size Extension

❑ CUT SHEET FEEDER OUTPUT TRAY EXTENSION GUIDE AND ROD SUPPORT

Remove

1. Separate the cut sheet feeder from the printer (see Section 1, Basics).
2. Open the cut sheet feeder output tray, and remove the cut sheet feeder output tray size extension.
3. Slide the extension guide to the end of the shaft. Using a precision screwdriver, lift up the tabs to free the extension guide from the rod (**Figure 2-13**).
4. If you wish to remove the rod support, press in on the lower ends of the support to free it from the output tray base.

Replace

1. To replace the rod support, press in slightly on the ends of the support and insert the ends into the holes on the output tray base.
2. To replace the extension guide, lift the tabs on each side of the guide and slide the guide over the rod.
3. Replace the output tray size extension.

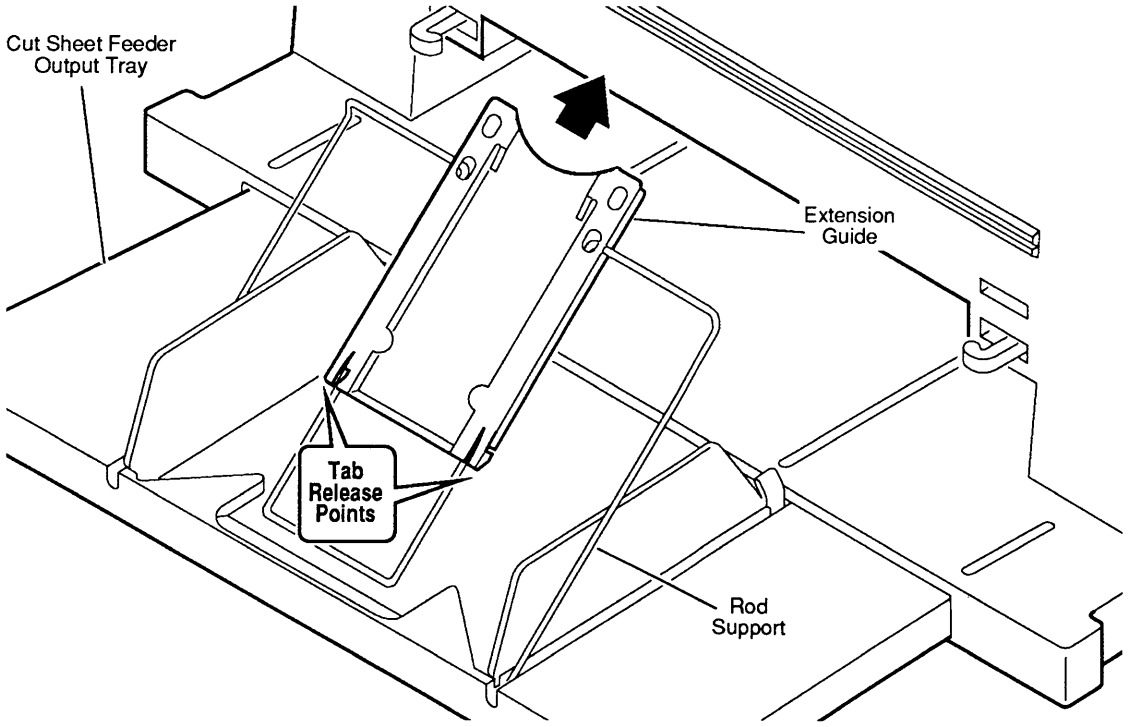


Figure 2-13 Output Tray Extension Guide

❑ CUT SHEET FEEDER OUTPUT TRAY AND BASE

Remove

1. Separate the cut sheet feeder from the printer (see Section 1, Basics).
2. Turn the cut sheet feeder so that you can see the bottom.
3. Remove the two screws (**Figure 2-14**) and lift off the output tray and base assembly.

Replace

Position the output tray and base assembly on the bottom of the cut sheet feeder and replace the two screws.

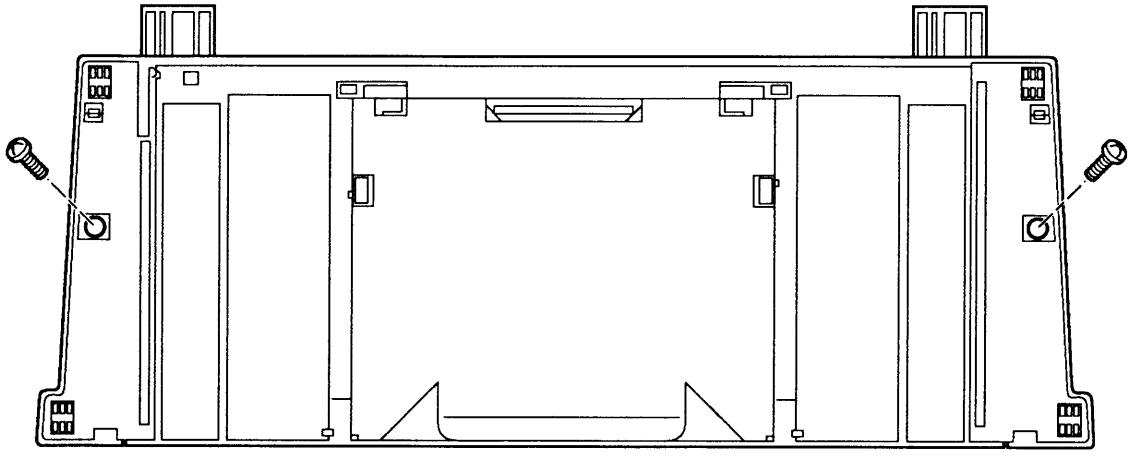


Figure 2-14 Output Tray and Base

❑ STYLEWRITER REVISION IDENTIFICATION

The StyleWriter has two different revisions, Revision A and Revision B. The revisions are identical in outward appearance. The identifying feature is the color of a small gear hidden behind the carriage hook assembly. Follow the procedures below to locate the distinguishing gear.

CAUTION: *The main logic board and printer frame modules are not interchangeable between StyleWriter Revision A and Revision B.*

1. Lower the front access cover if it has not been removed.

2. Locate a large gray gear below the carriage hook assembly. Manually rotate the carriage worm screw until the V-groove of the large gray gear faces up (**Figure 2-15A**).

3. Slide the carriage hook assembly to the left by guiding the lock flap through the V-groove of the large gray gear (**Figure 2-15A**). (It may be necessary to push gently on the carriage hook assembly or to rotate the worm screw slightly to slide the carriage hook assembly.)

4. Notice the gear that is next to the spring and at the right end of the worm screw (**Figure 2-15B**).

   If the the gear is black, the printer is a Revision A StyleWriter. Be certain that you use the main logic board and printer frame assembly for Revision A.

   If the the gear is gray, the printer is a Revision B StyleWriter. Be certain that you use the main logic board and printer frame assembly for Revision B.

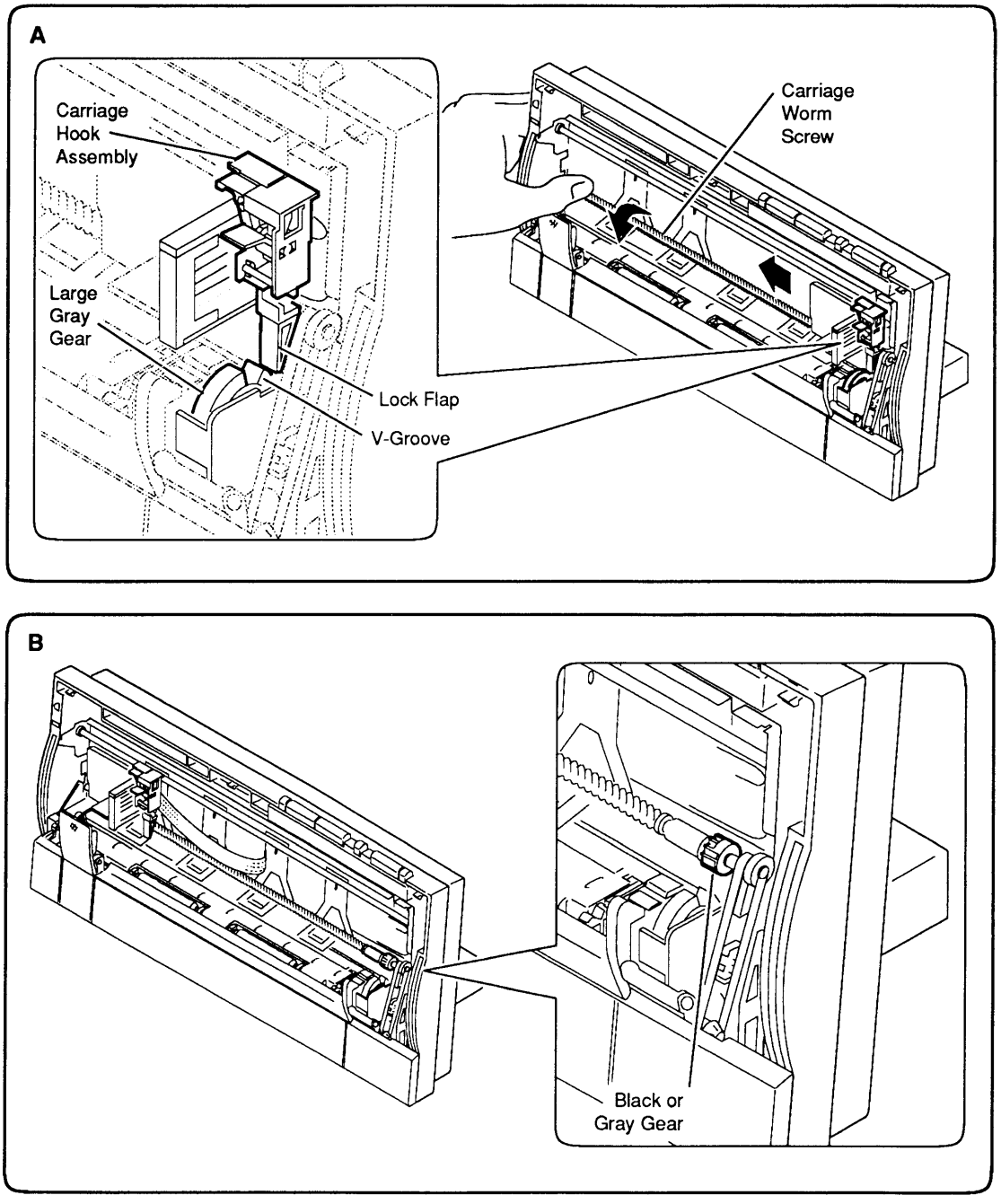


Figure 2-15 StyleWriter Revision Identification

Apple Technical Procedures

StyleWriter

Section 3 – Troubleshooting

❑ CONTENTS

❑ INTRODUCTION

Preliminary Checklist

Some problems may be corrected by simple measures that do not involve taking apart the printer. Before you attempt a repair and before you connect the printer to a computer, attempt to run the test page. If the test page does not run to completion, observe where the process stops working. Also, before you attempt any module replacement, first eliminate all other possible causes for the problem by following the checklist below:

Software Problems

Error messages on the Macintosh screen almost always indicate that the problem is software-related (rather than in the printer hardware).

- If the computer cannot find the printer:
  - Check to see that the StyleWriter driver is installed.
  - Check the serial cable connection.
  - Try swapping the serial cable.
- If you get system bombs, try reinstalling the system and printer files.
- If "what you see is not what you get," try known-good application software.

No Lights/ No Movement

If you get no response from the printer (no status lights, hum of operation, etc.) the problem is in the power function.

- Be sure the printer is plugged into the power adapter, the adapter is plugged into the wall socket, and the printer is turned on.
- Try another electrical outlet.
- Try replacing the AC power adapter.
- Try replacing the logic board 2.5 amp fuse.

Print Quality Problems

If you are seeing problems such as incomplete characters, too much ink, white lines, etc., the problem is almost certainly with the print head (which is contained in the ink cartridge). To correct the problem:

- Use correct paper weight.
- Purge the ink cartridge five times.
- Replace the ink cartridge with a known-good cartridge.
- Verify that the StyleWriter has the correct revision of the main logic board and printer frame assembly. See "StyleWriter Revision Identification" in Section 2, Take-Apart.

Mechanical Problems

If you are seeing paper feed problems, the problem may be in the cut sheet feeder or paper.

- Use correct paper weight.
- Clear any paper jam.
- Verify proper alignment of the cut sheet feeder with the printer.
- Replace the cut sheet feeder.

How to Use the Symptom/ Cure Chart

If you cannot solve the problem using the preliminary checklist, use the symptom/cure chart. First, find the symptom that most nearly describes the problem; then perform the first corrective action on the solution list. If that corrective action does not fix the problem, go to the next action. **If you replace a module and find that the problem remains, reinstall the original module before you go on to the next action.**

❑ SYMPTOM/CURE CHART

Status Light Problems	Solutions
• *No status lights*	1. Check AC adapter connection. 2. Replace AC adapter. 3. Replace fuse. 4. Check operation cable connection to logic board. 5. Replace main logic board. 6. Replace operations panel assembly. 7. Replace operations panel cable.
• *Error and power lights blink; ready light off*	1. Carriage is jammed. Remove anything that obstructs free motion of carriage. 2. Replace main logic board. 3. Verify that right-margin sensor is seated properly (see "Reseating the Right-Margin Sensor"). 4. Replace printer frame assembly. 5. Replace operations panel assembly. 6. Replace operations panel cable.
• *Error light blinks; power light on, ready light off*	1. Close front cover. 2. Check to be sure paper is inserted properly. 3. Check for paper jam; remove jam, then press ready switch. If ready and power lights come on steadily (and error light is off), the problem is resolved. 4. Replace paper sensor. 5. Replace main logic board. 6. Replace printer frame assembly. 7. Replace operations panel assembly. 8. Replace operations panel cable.

Print Problems	Solutions
• *Garbled printing*	1. Check interface cable between printer and computer. 2. Purge ink cartridge five times (see Section 1, Basics). 3. Replace ink cartridge. 4. Verify that printer frame assembly and main logic board are compatible with StyleWriter revision. (See "StyleWriter Revision Identification" in Section 2, Take-Apart.) 5. Replace main logic board. 6. Replace printer frame assembly.

- *No printing*

1. Verify that interface cable between printer and computer is tightly connected.
2. Make sure printer is selected in Chooser.
3. Purge ink cartridge five times (see Section 1, Basics).
4. Replace ink cartridge.
5. Replace paper sensor.
6. Replace main logic board.
7. Verify that right-margin sensor is seated properly (see "Reseating the Right-Margin Sensor").
8. Replace printer frame assembly.

- *Overprinting*

1. Verify that program being used is set for correct line spacing and line length.
2. Ensure that correct printer driver is installed.
3. Replace main logic board.
4. Replace printer frame assembly.

- *Image too light or too dark*

1. Purge ink cartridge five times (see Section 1, Basics).
2. Use 16 lb to 24 lb cotton bond paper.
3. Make sure forms thickness lever is set correctly (*up* for standard paper; *down* for envelopes, transparencies, labels, and heavy paper).
4. Replace ink cartridge.

- *White lines in printing*

1. Purge ink cartridge five times (see Section 1, Basics).
2. Replace ink cartridge.
3. Replace main logic board.
4. Replace printer frame assembly.

- *Page prints off center; images out of place*

1. Use 16 lb to 24 lb cotton bond paper.
2. Ensure sheet feeder holds no more than 50 sheets.
3. Set paper correctly in sheet feeder.
4. Ensure that margins in document and paper size in Page Setup are correct.
5. Replace main logic board.
6. Replace printer frame assembly.

- *Ink appears on back of paper*

1. Clean platen with a soft, dry cloth.
2. Clean platen rollers.
3. Replace platen rollers.
4. Replace printer frame assembly.

• *Image wavy, splotchy, or distorted*	1. Purge ink cartridge five times (see Section 1, Basics). 2. Replace ink cartridge. 3. Replace printer frame assembly.

Carrier Movement Problems	**Solutions**
• *Erratic carrier motion*	1. Replace main logic board. 2. Replace printer frame assembly.
• *Power light on, no carrier motion*	1. Check and, if obstructed, clear carrier area. 2. Replace main logic board. 3. Replace printer frame assembly.
• *Printer will not perform self-test; ready light on*	1. Replace main logic board. 2. Replace operations panel assembly. 3. Replace printer frame assembly.
• *Carrier grinds, hums loudly, or locks up*	1. Verify that right-margin sensor is seated properly (see "Reseating the Right-Margin Sensor"). 2. Replace printer frame assembly.

Paper Feed Problems	**Solutions**
• *No paper feed*	1. Verify alignment of cut sheet feeder with printer. 2. Release paper pressure plate on cut sheet feeder. 3. Clear paper path if it is obstructed. 4. Replace cut sheet feeder. 5. Replace main logic board. 6. Replace printer frame assembly.
• *Grinding during paper feed*	1. Verify that there are no obstructions in paper path. 2. Make sure forms thickness lever is set correctly (*up* for standard paper; *down* for envelopes, transparencies, labels, and heavy paper). 3. Verify alignment of cut sheet feeder with printer. 4. Replace cut sheet feeder. 5. Replace main logic board. 6. Replace printer frame assembly.

• *Paper feed difficulties: binding, tearing*	1. Make sure forms thickness lever is set correctly (*up* for standard paper; *down* for envelopes, transparencies, labels, and heavy paper). 2. Check and, if necessary, clear paper path. 3. Verify that paper is correctly installed. 4. Use 16 lb to 24 lb cotton bond paper. 5. Verify alignment of cut sheet feeder with printer. 6. Replace cut sheet feeder. 7. Replace printer frame assembly.
• *Envelope feed problems*	1. Since envelopes generally are thicker than cut sheets, the user must: • Make sure to adjust paper thickness lever when printing envelopes. • Reset paper thickness lever when printing on cut sheets is resumed. • Because of the difference in paper thickness between cut sheets and envelopes, do not run cut sheets and envelopes in the same print job. 2. Replace printer frame assembly.

Miscellaneous Problems	**Solutions**
• *Operations panel buttons don't work*	1. Make sure operations panel cable is securely connected to main logic board and operations panel. 2. Replace main logic board. 3. Replace operations panel. 4. Replace operations panel cable.
• *Software-specific problem*	1. Try known-good software. 2. Some software is incompatible with TrueType fonts. Check your software application manual.

❑ RESEATING THE RIGHT-MARGIN SENSOR

One possible cause of a grinding noise or failure to print is that the right-margin sensor has been jarred loose from the cartridge hook assembly. Reseating the right-margin sensor can eliminate the need for replacing the entire printer frame assembly. The reseating procedure is tricky, but may be worth a try. The following will help you find the sensor and, if necessary, reseat it.

1. Switch off the printer.

2. Remove the front access cover. (Remember to remove the ink cartridge.)

3. Manually rotate the carriage worm screw until the V-groove of the grey gear faces up (**Figure 3-1**).

4. Gently push the cartridge hook assembly toward the back and slide it to the left side of the worm screw.

5. Locate the right-margin sensor behind the cartridge hook assembly (**Figure 3-2**).

CAUTION: *The cable attached to the right-margin sensor is very fragile.*

6. Check to make sure that right-margin sensor is attached firmly to the cartridge hook assembly.

7. If the sensor is loose, use your fingers, a screwdriver, or needlenose pliers to press the sensor into the cartridge hook assembly (**Figure 3-2**).

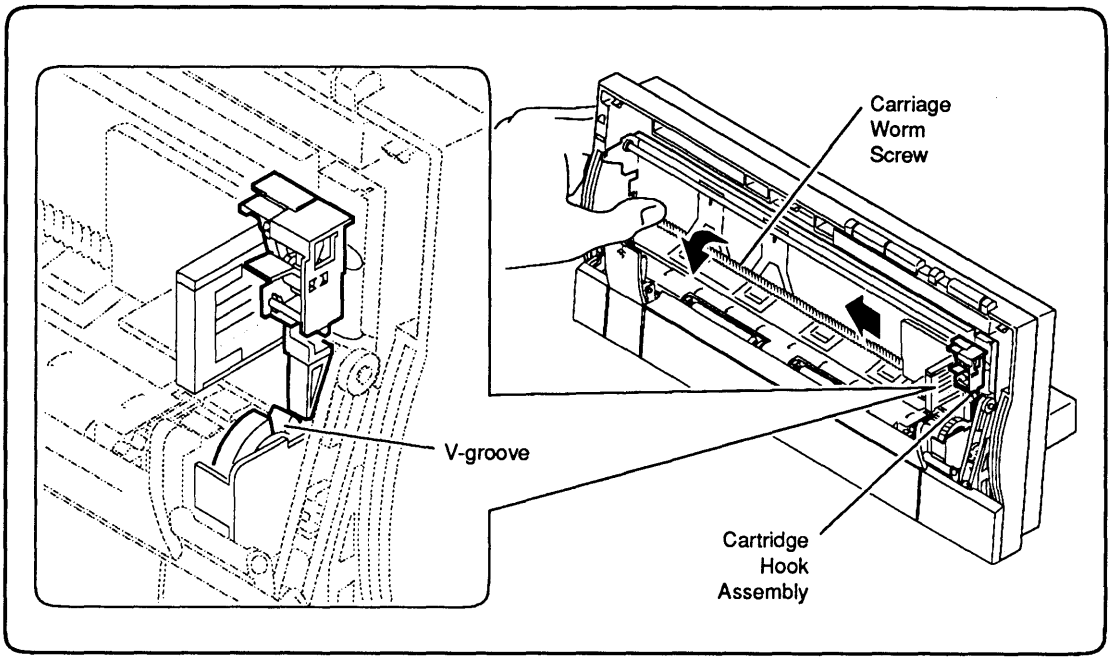


Figure 3-1 Moving the Cartridge Hook Assembly

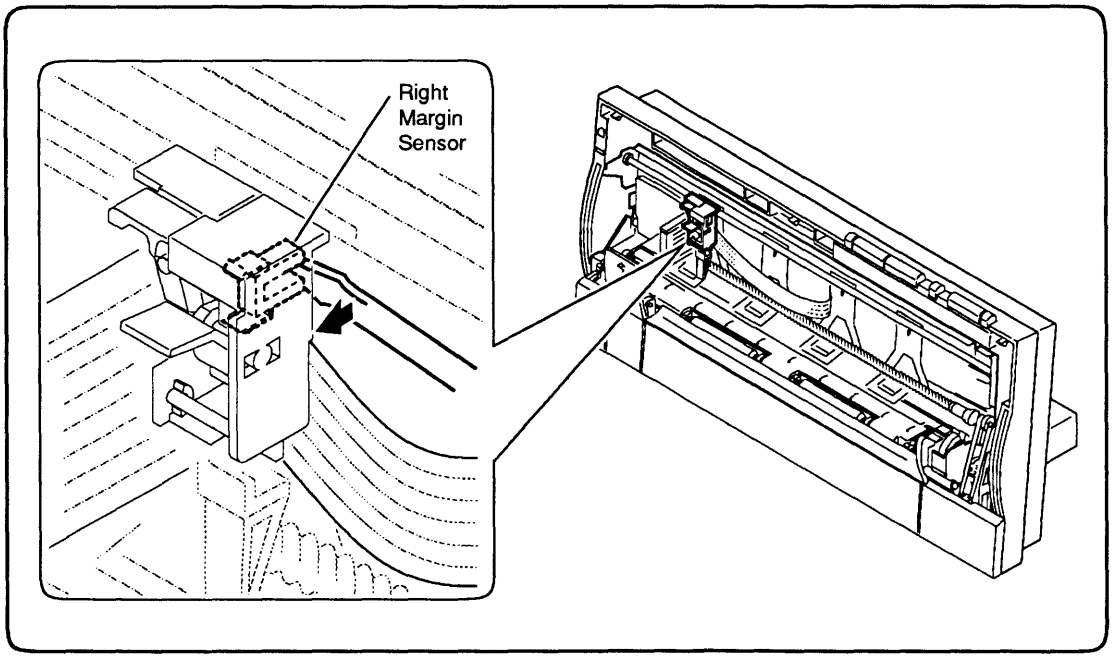


Figure 3-2 Reseating the Right-Margin Sensor

Apple Technical Procedures

StyleWriter

Illustrated Parts List

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Figure 1 includes all piece parts that can be purchased separately from Apple for the StyleWriter printer, along with their part numbers. These are the only parts available from Apple. Refer to your *Apple Service Programs* manual for prices.

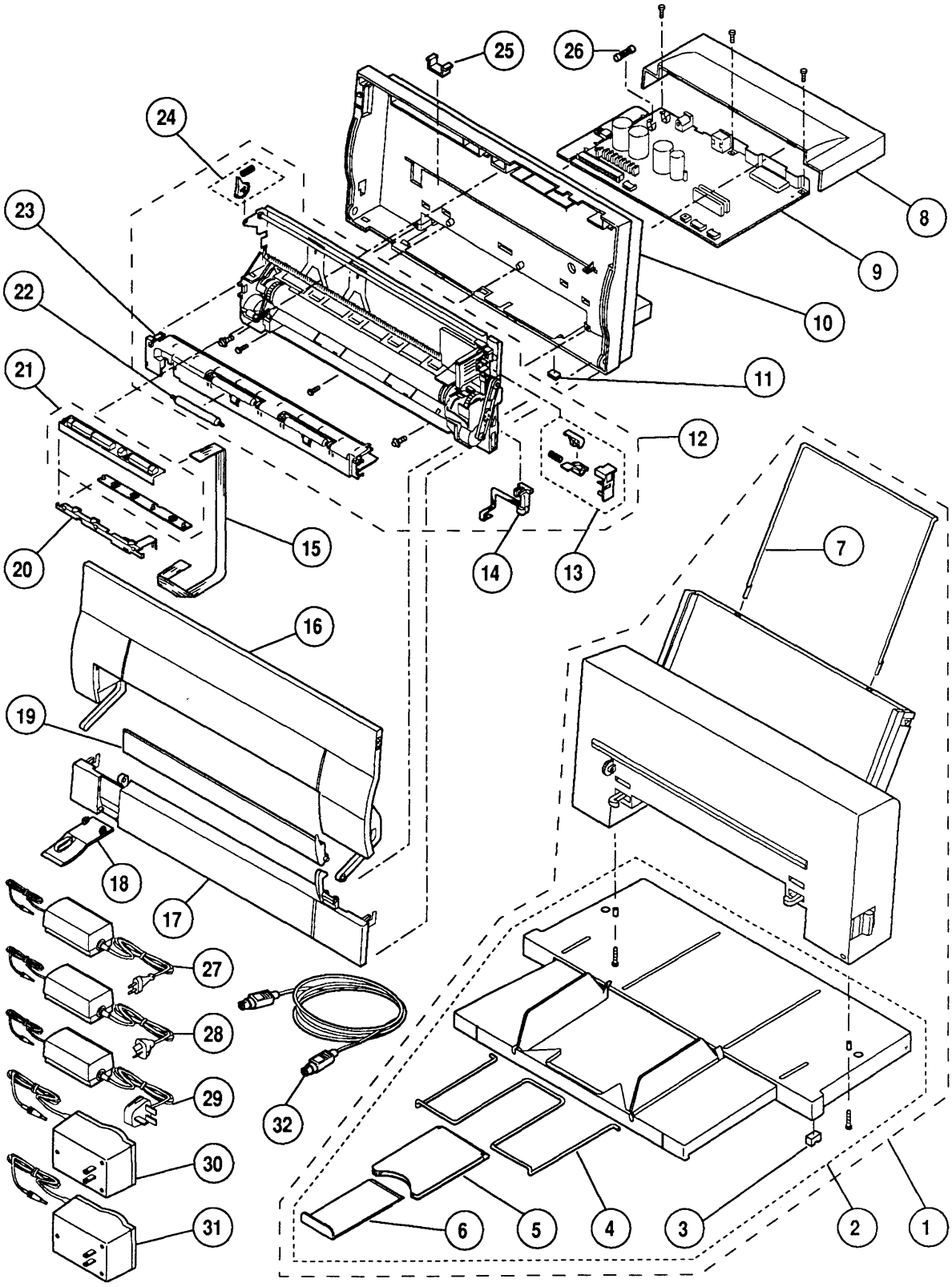

Figure 1 Exploded View

❑ EXPLODED VIEW (Figure 1)

Item	Part No.	Description
–	076-0337	Screw Hardware Kit (includes 10 packs for cut sheet feeder base, mounting printer frame, and RFI shield and mounting logic board)
1	661-0628	Cut Sheet Feeder (complete)
2	076-0401	Base & Tray, Cut Sheet Feeder (includes product label, rod support, size extension, and extension guide)
3	076-0334	Foot, Cut Sheet Feeder (10/pack)
4	970-0143	Rod Support, Cut Sheet Feeder Output Tray
5	949-0325	Extension Guide, Cut Sheet Feeder Output Tray
6	970-0269	Size Extension, Cut Sheet Feeder Output Tray
7	970-0142	Rod Support, Paper, Cut Sheet Feeder
8	949-0307	Cover, Main Logic Board
9	661-0629	Main Logic Board (includes fuse), StyleWriter Rev. A
	661-0716	Main Logic Board (includes fuse), StyleWriter Rev. B
10	076-0400	Rear Cover (includes product label)
11	076-0333	Printer Foot (10/pack)
12	661-0630	Printer Frame Assembly, (includes cartridge hook, paper sensor, forms thickness lever, and platen cover with rollers), StyleWriter Rev. A
	661-0718	Printer Frame Assembly, (includes cartridge hook, paper sensor, forms thickness lever, and platen cover with rollers), StyleWriter Rev. B
13	076-0336	Cartridge Hook Kit (contains cartridge hook, spring, lever, and holder)
14	890-0286	Paper Sensor
15	076-0389	Operation Panel Cable
16	949-0308	Front Access Cover
17	949-0311	Lower Access Cover
18	949-0312	Paper Release Lever
19	949-0319	Manual Feed Tray
20	949-0321	Operation Panel Shield
21	982-0062	Operation Panel Assembly (includes PCB and cover)
22	076-0335	Output Feed Roller (10/pack)
23	949-0309	Platen Cover (includes rollers)
24	076-0388	Kit, Forms Thickness Lever (contains forms thickness lever and spring)
25	952-0014	Base Retainer Clip (security)
26	941-5224	Fuse, 2.5 Amp, 250 V (10/pack)
27	Z699-2050	AC Power Adapter, Europe (220 VAC, 48-62 Hz)
28	X699-2050	AC Power Adapter, Australia (240 VAC, 48-62 Hz)
29	B699-2050	AC Power Adapter, UK (240 VAC, 48-62 Hz)
30	J699-2050	AC Power Adapter, Japan (100-105 VAC, 48-62 Hz)
31	699-2050	AC Power Adapter, USA (120 VAC, 58-62 Hz)
32	590-0552	Apple System/Peripheral-8 Cable