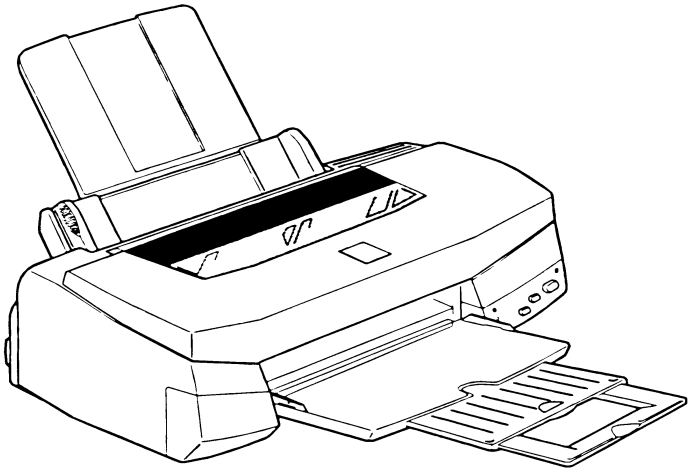
SERVICE MANUAL



Color ink jet printer

EPSON Stylus COLOR 440/640/740

COLOR IMAGING EPSON

EPSON®

TM-SC4/6/740

PREFACE

This manual describes basic functions, theory of electrical and mechanical operations, and maintenance and repair procedures of the Stylus COLOR 440, 640, and 740. The instructions and procedures included herein are intended for experienced repair technicians, and attention should be given to the precautions on the following pages.

Revision	Date
1st Release	November 1998

FCC COMPLIANCE STATEMENT FOR AMERICAN USERS

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio and television reception. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio and television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

WARNING

The connection of a non-shielded equipment interface cable to this equipment will invalidate the FCC Certification of this device and may cause interference levels that exceed the limits established by the FCC for this equipment. It is the responsibility of the user to obtain and use a shielded equipment interface cable with this device. If this equipment has more than one interface connector, do not leave cables connected to unused interfaces.

Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the printer.

FOR CANADIAN USERS

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le materiel brouilleur du Canada.

COPYRIGHT NOTICE

TRADEMARKS

PRECAUTIONS

Precautionary notations throughout the text are categorized with respect to: (1) personal injury and (2) damage to equipment.

Signals a precaution which, if ignored, could result in serious or fatal personal injury. Great caution should be exercised in performing a procedure preceded by a WARNING.

Signals a precaution which, if ignored, could result in damage to equipment.

Always observe the precautions listed below when performing repair and maintenance procedures.

WARNING

1. Always disconnect the product from both the power source and the host computer before performing any maintenance or repair procedure.
2. No work should be performed on the unit by persons unfamiliar with basic safety measures dictated for all electronics technicians in their line of work.
3. In performing testing described in this manual, do not connect the unit to a power source until instructed to do so. When the power supply cable must be connected, use extreme caution in working on the power supply and other electronic components.

CAUTION

1. Repairs on EPSON products should be perfomed only by an EPSON-certified repair technician.
2. Make certain that the source voltage is the same as the rated voltage listed on the serial number/rating plate. If the EPSON product has a primary AC rating different from the available power source, do not connect it to the power source.
3. Always verify that the EPSON product has been disconnected from the power source before removing or replacing printed circuit boards or individual chips.
4. To protect sensitive microprocessors and othe circuitry, use static discharge equipment, such as anti-static wrist straps, when accessing internal components.
5. Replace malfunctioning components only with those components recommended by the manufacturer; introduction of second-source ICs or other nonapproved components may damage the product and void any applicable EPSON warranty.

Table of Contents

1. Product Description

2. Operating Principles

3. Troubleshooting

4. Disassembly and Assembly

5. Adjustments

6. Maintenance

7. Appendix

CHAPTER

1

PRODUCT DESCRIPTION

1.1 Features

The EPSON Stylus COLOR 440/640/740 printers are high-performance, low-cost printers designed for the small office/home office (SOHO) market. The Stylus COLOR 440 has the same print quality (720 × 720 dpi) as the Stylus ProXL; the Stylus COLOR 640 and Stylus COLOR 740 have the same print quality (1440 × 720) as the Stylus COLOR 600 and Stylus COLOR 800.

The main features of these printers are:

- ❑ High-quality color printing
  - ■ High resolution:
    Stylus COLOR 440—720 (H) x 720 (V) dpi
    Stylus COLOR 640—1440 (H) X 720 (V) dpi
    Stylus COLOR 740—1440 (H) X 720 (V) dpi
  - ■ Standard four-color printing (cyan, magenta, yellow, and black)
    Stylus COLOR 440—Black: 64 nozzles; CMY: 21 nozzles
    Stylus COLOR 640: Black: 64 nozzles; CMY: 32 nozzles
    Stylus COLOR 740: Black: 144 nozzles; CMY: 48 nozzles
  - ■ Traditional printing and new Microweave printing that eliminates banding
- ❑ Built-in auto sheet feeder
  - ■ Holds 100 cut-sheets (55 g/m2)
  - ■ Holds 10 envelopes
  - ■ Holds 10 transparencies
  - ■ Holds 65 sheets of special paper
- ❑ High-speed printing
  - ■ Stylus COLOR 440: 200 cps at 10 cpi
  - ■ Stylus COLOR 640: 200 cps in Normal mode, 400 cps in Draft mode
  - ■ Stylus COLOR 740: 200 cps
  - ■ The printer's head drive frequency, 14.4 KHz, allows printing that is twice as fast as that of the Stylus COLOR (true of all three models).
- ❑ Compact size
  - ■ Stylus COLOR 440: 16.9" (429 mm) W x 9" (231 mm) D x 6.1" (155 mm) H
  - ■ Stylus COLOR 640: 16.9" (429 mm) W x 9: (231 mm) D x 6.2" (157 mm) H
  - ■ Stylus COLOR 740: 16.9" (429 mm) W x 10.3" (261 mm) D) x 6.2" (157 mm) H
- ❑ Light-weight
  - ■ Weight: 11.5 lbs. (5.2 Kg)
- ❑ Acoustic noise
  - ■ Stylus COLOR 440: Approximately 45 dB
  - ■ Stylus COLOR 640: Approximately 47 dB
  - ■ Stylus COLOR 740: Approximately 47 dB
- ❑ One combined printhead for black and color
- ❑ Bidirectional parallel interface (IEEE-1284 level 1 device) for all three models
- ❑ Additional interfaces:
  - ■ Stylus COLOR 740: USB
- ❑ Operating environments:
  - ■ Stylus COLOR 440 and 640: Windows only
  - ■ Stylus COLOR 740: Windows and Macintosh

- Fonts:
  - All three models: Standard and NLSP
  - Stylus COLOR 740: 5 scalable fonts

Table 1-1. Consumables Available for Stylus Color 440/640/740

Items	Codes	Remarks
Black ink cartridge	S020189	Stylus Color 740
Black ink cartridge	S020187	Stylus Color 440, 640
CMY ink cartridge	S020191	Stylus Color 440, 640, 740
EPSON 360 dpi ink jet paper	S041025	Size: A4 (200 sheets)
EPSON 360 dpi ink jet paper	S041059	Size: A4 (100 sheets)
EPSON 360 dpi ink jet paper	S041060	Size: Letter (100 sheets)
Photo quality ink jet paper	S041026	Size: A4 (200 sheets)
Photo quality ink jet paper	S041061	Size: A4 (100 sheets)
Photo quality ink jet paper	S041062	Size: Letter
Photo quality ink jet paper	S041067	Size: Legal
Photo quality glossy paper (new release)	S041126	Size: A4
Photo quality glossy paper (new release)	S041124	Size: Letter
Photo quality glossy film	S041071	Size: A4
Photo quality glossy film	S041124	Size: Letter
Photo quality glossy film	S041107	Size: A6
Ink jet transparencies	S041063	Size: A4
Ink jet transparencies	S041064	Size: Letter
Photo quality ink jet cards	S041054	Size: A6
Photo quality ink jet cards	S041121	Size: 5 x 8 inches
Photo quality ink jet cards	S041122	Size: 8 x 10 inches
Photo quality self-adhesive sheets	S041106	Size: A4

1.2 Specifications

This section provides the following information for all three printers: printing specifications, paper specifications, printable area, adjust lever settings, ink cartridge specifications, environmental conditions, electric specifications, reliability statistics, safety approvals, and CE marking.

1.2.1 Printing Specifications

- Print method
  - On-demand ink jet (MACH type; one unit combining black and color heads)
- Print direction
  - Bidirectional with logic seeking
- Print speed/Printable columns

Table 1-2. Character Mode Speed

Model Name	Character Pitch	Printable Columns	LQ Speed	Draft Speed
Stylus COLOR 440	10	80	200 CPS	—
Stylus COLOR 640	10	80	200 CPS	400 CPS
Stylus COLOR 740	10	80	200 CPS	—

Table 1-3. Graphic Mode Speed

Horizontal Resolution	Printable Area	Available dots	CR Speed
180 dpi	8.26	1488	20 IPS
360 dpi	8.26	2976	20 IPS
720 dpi	8.26	5952	20 IPS

- Nozzle Configurations:
  - Stylus COLOR 440 (see Figure 1-1):
    Black— 64 nozzles
    Color—21 nozzles × 3 (CMY)
  - Stylus COLOR 640 (see Figure 1-2):
    Black— 64 nozzles
    Color—32 nozzles × 3 (CMY)
  - Stylus COLOR 740 (see Figure 1-3):
    Black— 144 nozzles
    Color—48 nozzles × 3 (CMY)

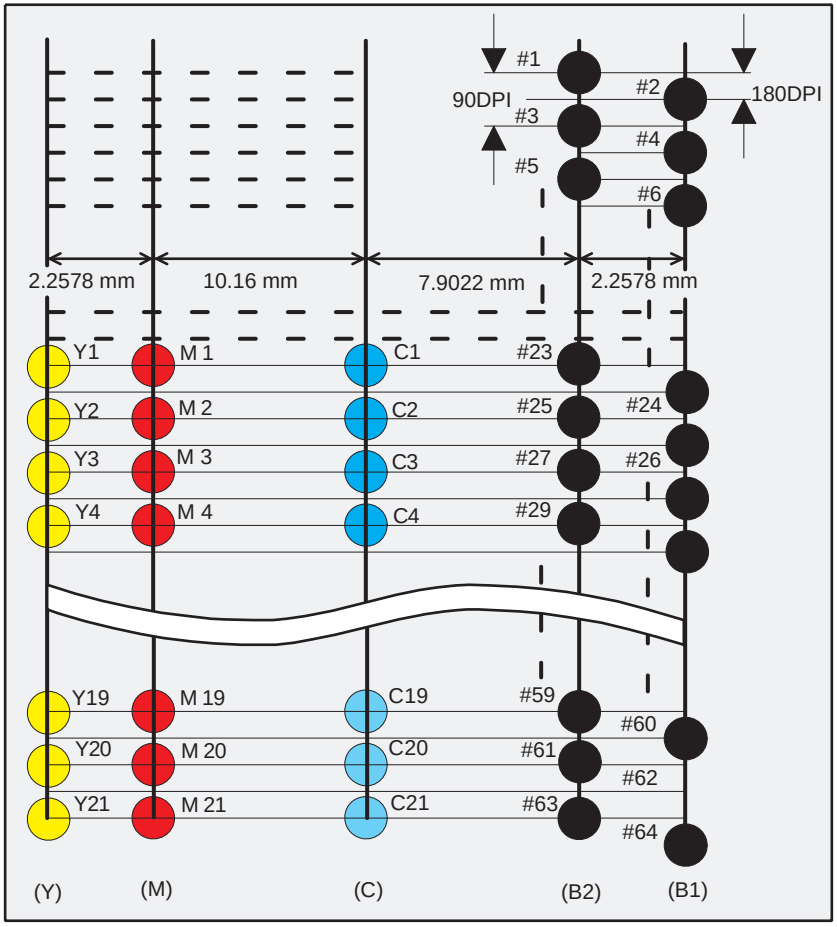


Figure 1-1. Nozzle Configuration for the Stylus COLOR 440

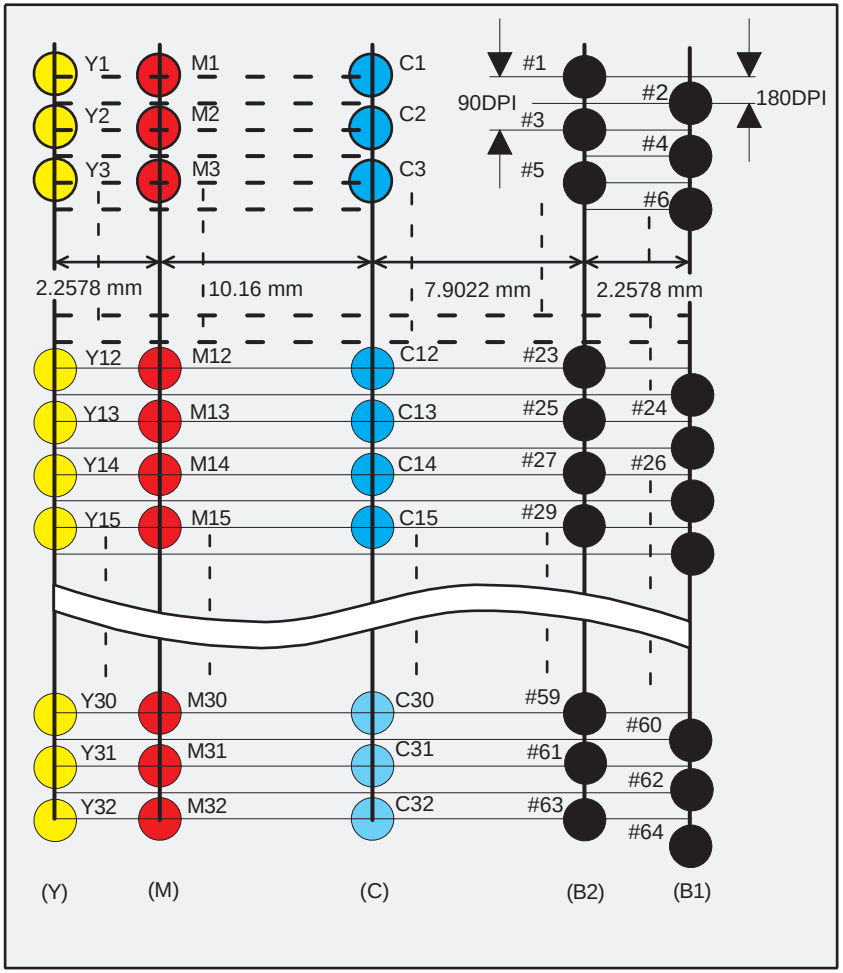


Figure 1-2. Nozzle Configuration for the Stylus COLOR 640

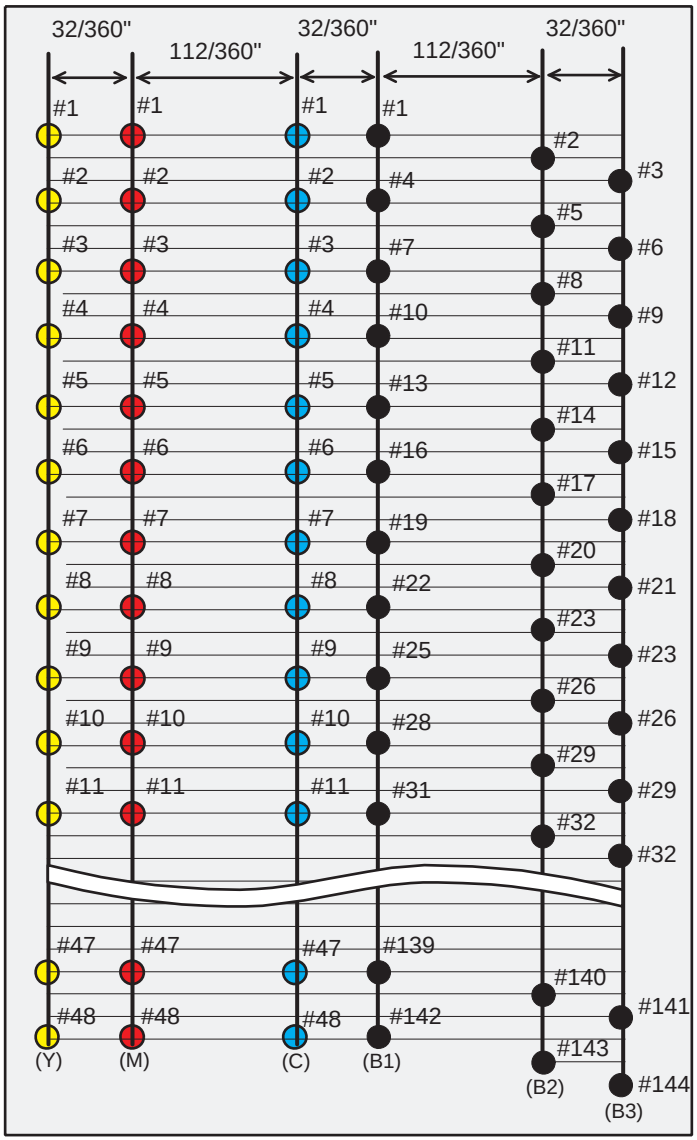


Figure 1-3. Nozzle Configuration for the Stylus COLOR 740

- Feed method
  - Friction feed with the ASF (Automatic Sheet Feeder)
- Line spacing
  - Stylus COLOR 440: 1/6 inch, or programmable in units of 1/360 inch
  - Stylus COLOR 640: 1/6 inch, or programmable in units of 1/360 inch
  - Stylus COLOR 740: 1/6 inch, or programmable in units of 1/360 inch
- Paper path
  - Cut-sheets: ASF (top entry)
- Feed speed
  - Stylus COLOR 440 and 640:
    190 ms per 1/3-inch (8.5-mm) increment advance
    2.0 in/sec (50.8 mm/sec), continuous
  - Stylus COLOR 740
    110 ms, advancing in 0.4-inch (10.16-mm) increments
    4.5 in/sec (114.3 mm/sec), continuous
- Ink supply
  - Ink cartridges (Black and CMY)
- Input data buffer
  - Stylus COLOR 440: 10 Kb
  - Stylus COLOR 640: 32 Kb
  - Stylus COLOR 740: 64 Kb

- Paper capacity of input tray
  - Size: Index card to Legal
  - Thickness: Less than 8 mm
  - Paper capacity: 100 cut sheets
    10 envelopes
    65 sheets of coated paper (360 dpi)
    65 sheets of coated paper (720 dpi)
    20 glossy sheets or sheets of EPSON Photo Paper
    30 transparency sheets
    30 index cards
    1 sheet of any of the following: Panoramic Photo Paper, Iron-On Cool Peel Transfer Paper, Photo Stickers, Glossy Film, Self Adhesive Paper
- Character tables:
  - Stylus COLOR 440 and 640
    - PC437 (US, Standard Europe)
    - PC850 (Multilingual)

NOTE: *These character sets are not available for selection in the default setting mode.*

  - Stylus COLOR 740
    - Standard version: 11 character tables
      Italic, PC437 (US Standard, Europe), PC850 (Multilingual), PC860 (Portuguese), PC861 (Icelandic), PC863 (Canadian-French), PC865 (Nordic), Abicomp, BRASCII, Roman 8, ISO Latin 1
    - NLSP version: 30 character tables
      Italic, PC437, PC437 Greek, PC850, PC852, PC853, PC855, PC857, PC860, PC861, PC865, PC866, ISO8859-7, ISO Latin 1T, PC774, Estonia, ISO8859-2, PC866-LAT, PC866UKR, PC AR864, PC APTEC, PC708, PC720, Hebrew7*, Hebrew8*, PC862*

NOTE: *Character tables marked with an asterisk are not available for selection in the default setting mode.*

- Typefaces
  - Stylus COLOR 440 and 640

    Bitmap LQ font: EPSON Courier 10 cpi
  - Stylus COLOR 740
    - Bitmap LQ fonts:

EPSON Roman	10 cpi, 12 cpi, 15 cpi, Proportional
EPSON Sans Serif	10 cpi, 12 cpi, 15 cpi, Proportional
EPSON Courier	10 cpi, 12 cpi, 15 cpi
EPSON Prestige	10 cpi, 12 cpi, 15 cpi
EPSON Script	10 cpi, 12 cpi, 15 cpi

    - Scalable fonts:

EPSON Roman	10.5 pt.; 8 to 32 pt. (2 pt. increments)
EPSON Sans Serif	10.5 pt.; 8 to 32 pt. (2 pt. increments)
EPSON Roman T	10.5 pt.; 8 to 32 pt. (2 pt. increments)
EPSON Sans Serif H	10. 5pt.; 8 to 32 pt. (2 pt. increments)

NOTE: *Each typeface has 4 variations: Normal, Bold, Italic, and Bold Italic.*

- Control codes
  - Stylus COLOR 440 and 640
    ESC/P raster
    EPSON remote commands
  - Stylus COLOR 740
    ESC/P2 and ESC/P raster
    EPSON remote commands

1.2.2 Paper Specifications

This section describes the printable area and types of paper that can be used with these printers.

1.2.2.1 Cut Sheets

Sizes

Letter:	Width 8.5” (216 mm) x Length 11.0” (279 mm)
Legal:	Width 8.5” (216 mm) x Length 14.0” (356 mm)
Statement:	Width 5.5” (139.7 mm) x Length 8.5” (216 mm)
Exclusive:	Width 7.5” (190.5 mm) x Length 10” (254 mm)
A4:	Width 8.3” (210 mm) x Length 11.7” (297 mm)
B5:	Width 7.2” (182 mm) x Length 10.1” (257 mm)

Thickness

0.003” (0.08 mm) to 0.004” (0.11 mm)

Weight

17 lb (64 g/m^2) to 24 lb (90 g/m^2)

Quality

EPSON paper, bond paper, or PPC

1.2.2.2 Transparencies, Glossy Paper

Sizes

Letter: Width 8.5” (216 mm) x Length 11.0” (279 mm)
A4: Width 8.3” (210 mm) x Length 11.7” (297 mm)

Thickness

0.003” (0.075 mm) to 0.0033” (0.085 mm)

NOTE: *Printing on transparencies is available only at normal temperatures.*

1.2.2.3 Envelopes

Sizes

No.10 Width 9.5” (241 mm) x Length 4.13” (104.88 mm)
DL Width 8.7” (220 mm) x Length 4.3” (110 mm)
C6 Width 6.4” (162 mm) x Length 4.5” (114 mm)

Thickness

0.006” (0.16 mm) to 0.02” (0.52 mm)

Weight

12 lb (45 g/m^2) to 20 lb (75 g/m^2)

Quality or Paper Type

Bond paper envelopes, plain paper envelopes, or air mail envelopes

NOTES:

1. *Printing on envelopes is available only at normal temperatures.*
2. *Load the longer side of the envelope horizontally.*

1.2.2.4 Card Stock

Sizes

5 x 8” card: Width 5.0” (127 mm) x Length 8.0” (203 mm)
8 x 10” card: Width 8.0” (203 mm) x Length 10.0” (254 mm)
A6 card: Width 4.1” (105 mm) x Length 5.8” (148 mm)
A5 card: Width 5.8” (148 mm) x Length 8.3” (210 mm)

Thickness

Less than 0.0091” (0.23 mm)

1.2.3 Printable Area

Cut Sheets

Figure 1-4 in the right column and the tables on the following page show printable areas in character mode and raster graphics mode.

NOTE: *Character mode is supported only by the Stylus COLOR 740.*

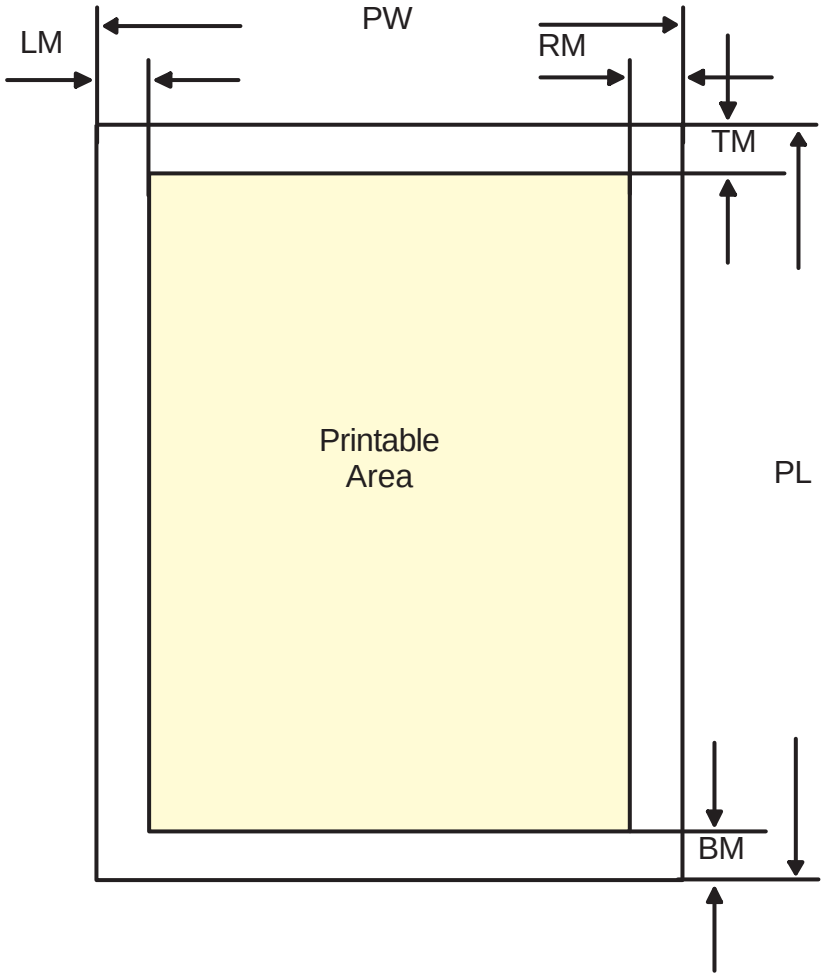


Figure 1-4. Printable Area for Cut Sheets

Table 1-4. Raster Graphics Mode

Paper Size	PW (Typical Paper Width)	PL (Typical Paper Length)	LM (Minimum Left Margin)	RM (Minimum Right Margin)	TM (Minimum Top Margin	BM (Minimum Bottom Margin)
A4	8.3” (210 mm)	11.7” (297 mm)	0.12” (3 mm)	0.12” (3 mm)	0.12” (3 mm)	0.54” (14 mm) 0.12” (3 mm)
Letter	8.5” (216 mm)	11.0” (279 mm)	0.12” (3 mm)	0.35” (9 mm)	0.12” (3 mm)	0.54” (14 mm) 0.12” (3 mm)
B5	7.2” (182 mm)	10.1” (257 mm)	0.12” (3 mm)	0.12” (3 mm)	0.12” (3 mm)	0.54” (14 mm) 0.12” (3 mm)
Legal	8.5” (216 mm)	14.0” (356 mm)	0.12” (3 mm)	0.35” (9 mm)	0.12” (3 mm)	0.54” (14 mm) 0.12” (3 mm)
Statement	5.5” (139.7 mm)	8.5” (216 mm)	0.12” (3 mm)	0.12” (3 mm)	0.l2” (3 mm)	0.54” (14 mm) 0.12” (3 mm)
Executive	7.5” (190.5 mm)	10”(254 mm)	0.12” (3 mm)	0.12” (3 mm)	0.12” (3 mm)	0.54” (14 mm) 0.12” (3 mm)

Table 1-5. Character Mode (Stylus COLOR 740 only)

Paper Size	PW (Typical Paper Width)	PL (Typical Paper Length)	LM (Minimum Left Margin)	RM (Minimum Right Margin)	TM (Minimum Top Margin)	BM (Minimum Bottom Margin)
A4	8.3” (210 mm)	11.7” (297 mm)	0.12” (3 mm)	0.12” (3 mm)	0.12” (3 mm)	0.54” (14 mm) 0.12” (3 mm)
Letter	8.5” (216 mm)	11.0” (279 mm)	0.12” (3 mm)	0.35” (9 mm)	0.12” (3 mm)	0.54” (14 mm) 0.12” (3 mm)
B5	7.2” (182 mm)	10.1” (257 mm)	0.12” (3 mm)	0.12” (3 mm)	0.12” (3 mm)	0.54” (14 mm) 0.12” (3 mm)
Legal	8.5” (216 mm	14.0” (356 mm)	0.12” (3 mm)	0.35” (9 mm)	0.12” (3 mm)	0.54” (14 mm) 0.12” (3 mm)
Statement	5.5” (139.7 mm)	8.5” (216 mm)	0.12” (3 mm)	0.12” (3 mm)	0.12” (3 mm)	0.54” (14 mm) 0.12” (3 mm)
Executive	7.5” (190.5 mm)	10” (254 mm)	0.12” (3 mm)	0.12” (3 mm)	0.12” (3 mm)	0.54” (14 mm) 0.12” (3 mm)

Envelopes

Table 1-6 and Figure 1-5 show the printable area for envelopes.

Table 1-6. Printable Area for Envelopes

Envelope Size	LM (Minimum Left Margin)	RM (Minimum Right Margin)	TM (Minimum Top Margin)	BM (Minimum Bottom Margin)
#10	0.12” (3 mm)	1.10” (28 mm)	0.12” (3 mm)	0.54” (14 mm) 0.12” (3 mm)
DL	0.12” (3 mm)	0.28” (7 mm)	0.12” (3 mm)	0.54” (14 mm) 0.12” (3 mm)
C6	0.12” (3 mm)	0.12” (3 mm)	0.12” (3 mm)	0.54” (14 mm) 0.12” (3 mm)

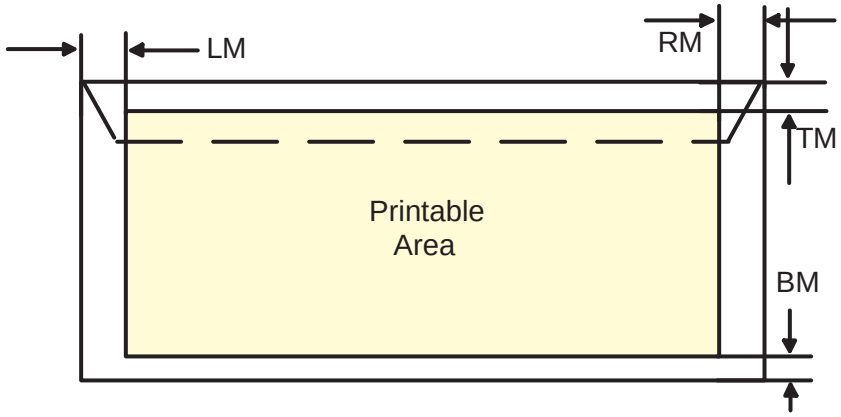


Figure 1-5. Printable Area for Envelopes

1.2.3.1 Adjust Lever Setting (PG Adjust Lever)

The adjust lever (blue) on the right side under the printer cover needs to be set to the proper position for the paper you print on. (See Table 1-7.) If you find that the paper wrinkles during printing, or if smudges appear on the paper, move the lever to the + position (toward the rear), regardless of paper type.

Table 1-7. Adjust Lever Setting

Lever Position	Clearance between head and platen
Plus position	1.04 mm
Zero position	1.74 mm (+0.7 mm)

NOTE: *Always return the adjust lever to the zero position after you finish printing. Leaving the lever in the plus position may cause poor printing in the next printout.*

1.2.4 Ink Cartridge Specifications

Black Ink Cartridge

Table 1-8. Black Ink Cartridge Specifications

Items	Specifications
Type	Exclusive EPSON ink cartridges designed for the Stylus COLOR 440, 640, and 740
Print capacity	• Stylus COLOR 440 and 640 -540 pages / letter or A4 (ISO/IEC 10561 Letter Pattern at 360 dpi) • Stylus COLOR 740 - 900 pages / letter or A4 (ISO/IEC 10561 Letter Pattern at 360 dpi)
Cartridge life	2 years (sealed in package) / 6 months (out of package)
Environmental conditions	• Temperature - Storage: -4 to 104 °F (-20 to 40 °C) 1 month at 104 °F (40 °C) - Packing storage: -22 to 104 °F (-30 to 40 °C) 1 month at 104 °F (40 °C) - Transit: -22 to 140 °F (-30 to 60 °C) 1 month at 104 °F (40 °C) 120 hours at 140 °F (60 °C) • Humidity 5% to 85% (without condensation) ***Note:*** *Ink freezes below 27 °F (-3 °C) but it thaws and is usable after 3 hours at 77 °F (25 °C).*
Dimensions	• *Stylus COLOR 440 and 640* 0.78" W × 2.1" D × 1.52" H (19.8 mm W × 52.7 mm D × 38.5 mm H) • *Stylus COLOR 740* 1.09" W × 2.1" D × 1.5" H (27.8 mm W × 52.7 mm D × 38.5 mm H)
Weight	Cartridge plus ink: 1.06 oz (30 g) Total ink: 0.58 oz +/- 0.02 oz (16.4 +/-0.5 g) Consumable ink weight: more than 0.43 oz (12.1 g)

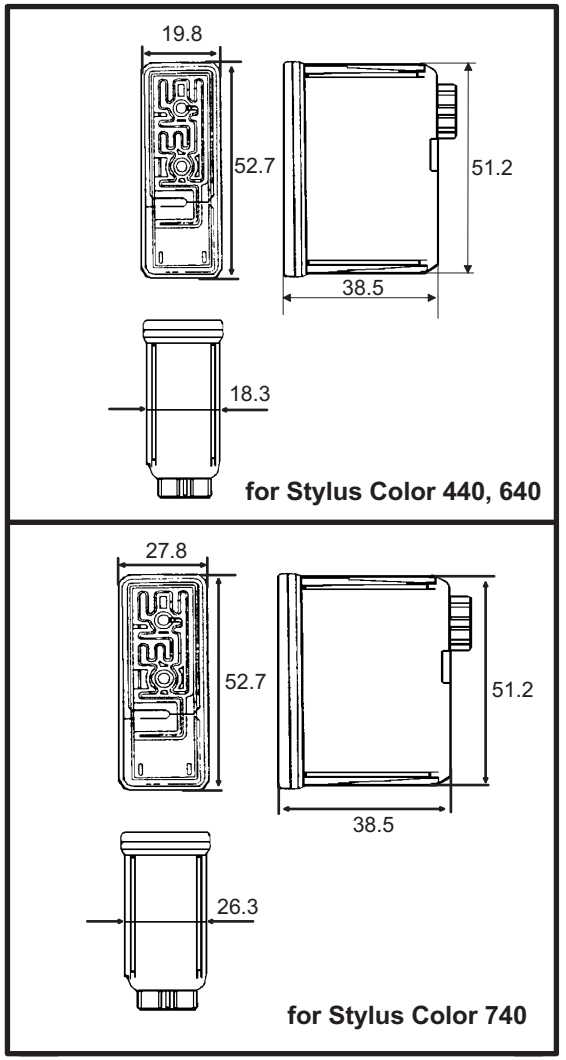


Figure 1-6. Black Ink Cartridge Dimensions (units in mm)

Color Ink Cartridge

Table 1-9. Color Ink Cartridge Specifications

Items	Specifications
Type	Cartridge especially designed for the Stylus COLOR 440, 640 and 740
Colors	Cyan, Magenta, Yellow (CMY)
Print capacity	300 pages / A4 (360 dpi, 5% duty each color)
Cartridge life	2 years (sealed in package) / 6 months (out of package)
Environmental conditions	• Temperature - Storage: -4 to 104 °F (-20 to 40 °C) 1 month at 104 °F (40 °C) - Packing storage: -22 to 104 °F (-30 °C to 40 °C) 1 month at 104 °F (40 °C) - Transit: -22 to 140 °F (-30 °C to 60 °C) 1 month at 104 °F (40 °C) 120 hours at 140 °F (60 °C) • Humidity 5% to 85% (without condensation) ***Note:*** *Ink freezes below 27 °F (-3 °C), but it thaws and is usable after 3 hours at 77 °F (25 °C).* • Dimensions 1.7" W × 2.1" D × 1.5" H (42.9 mm W × 52.7 mm D × 38.5 mm H)
Weight	Cartridge plus ink: 2.36 oz (67 g) Total ink: 0.45 oz +/- 0.02 oz (12.8 +/-0.5 g) Consumable ink weight: more than 0.34 oz (9.6 g)

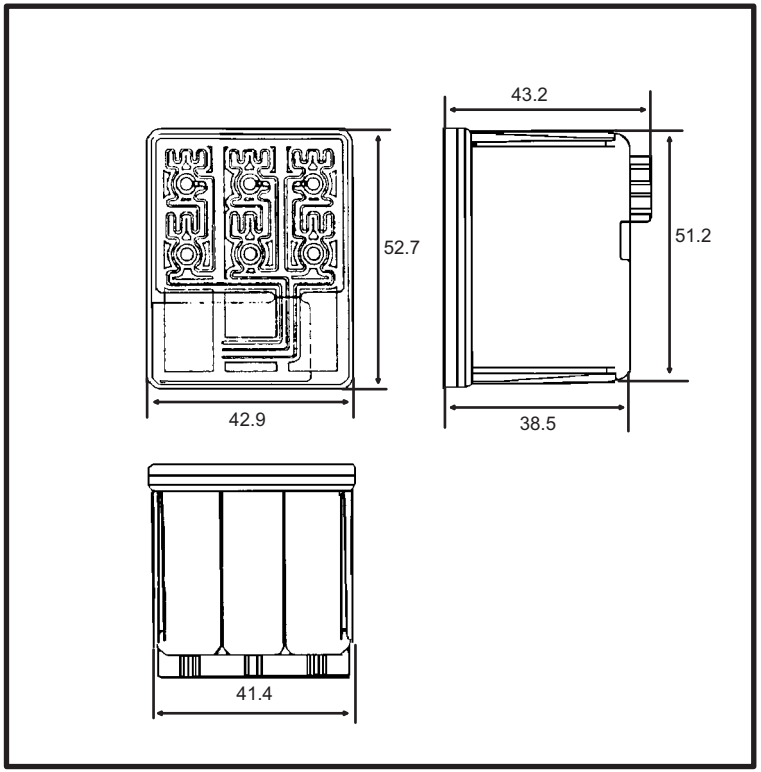


Figure 1-7. Color Ink Cartridge Dimensions (units in mm)

1.2.5 Environmental Conditions

- Temperature
  - Operating : 50 to 95 °F (10 to 35 °C) (See Figure 1-8.)
  - Non-operating:-4 °F to 140 °F (-20 to 60 °C) in shipment container

NOTE: *1 month at 104 °F (40 °C) and 120 hours at 140 °F (60 °C)*

- Humidity
  - Operating: 20% to 80% RH without condensation (See Figure 1-8.)
  - Non-operating: 5% to 85% RH without condensation and in shipping container

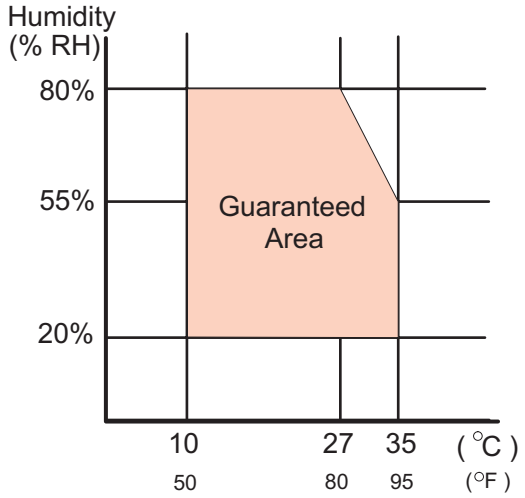


Figure 1-8. Temperature / Humidity of Range

- Resistance to shock
  - Operating: 1 G, within 1 ms
    X, Y, and Z directions
  - Non-operating: 2 G, within 2 ms
    X, Y, and Z directions, in shipment container
- Resistance to vibration
  - Operating: 0.15 G
  - Non-operating: 0.50 G

NOTES:

1. *When the printer is not in operation, make sure that the printhead is capped.*
2. *During transport, make sure the printhead is capped and the ink cartridges are installed.*
3. *If you notice that the printhead is not capped while power is off, turn power on (ink cartridges should be installed). After the printhead has moved to the capping position, turn power off again.*
4. *Ink freezes under 27 °F (-3 °C), but thaws and becomes usable again after 3 hours at 77 °F (25 °C).*

1.2.6 Electrical Specifications

120 V Version

Rated voltage:	120 VAC
Input voltage range:	99 to 132 VAC
Rated frequency range:	50 to 60 Hz
Input frequency range:	49.5 to 60.5 Hz
Rated current:	0.4 A (maximum 0.5 A)
Power consumption:	Approximately 16 W (ISO/IEC 10561 Letter pattern); ENERGY STAR-compliant
Insulation resistance:	10M ohms minimum (between AC line and chassis, 500 VDC)
Dielectric strength:	1000 VAC rms for 1 minute or 1200 VAC rms for 1 second (between AC line and chassis)

220 to 240V Version

Rated voltage:	220 to 240 VAC
Input voltage range:	198 to 264 VAC
Rated frequency range:	50 to 60 Hz
Input frequency range:	49.5 to 60.5 Hz
Rated current:	0.2 A (maximum 0.3 A)
Power consumption:	Approximately 16 W (ISO/IEC 10561 Letter pattern); ENERGY STAR-compliant
Insulation resistance:	10M ohms minimum (500 VDC between AC line and chassis)
Dielectric strength:	1500 VAC rms for 1 minute (between AC line and chassis)

1.2.7 Reliability

Total Print Volume

Stylus COLOR 440: 10,000 pages (A4, Letter)
Stylus COLOR 640: 25,000 pages (A4, Letter)
Stylus COLOR 740: 75,000 pages (A4, Letter)

Printhead Life

Stylus COLOR 440: 2x109 dots/nozzle
Stylus COLOR 640: 2x109 dots/nozzle
Stylus COLOR 740: 4x109 dots/nozzle

1.2.8 Safety Approvals

120 V Version

Safety standards	UL1950 with D3 CSA22.2 No.950 with D3
EMI	FCC part 15 subpart B class B CSA C108.8 class B

220 to 240 V Version

Safety standards	EN 60950 (VDE, NEMKO)
EMI	EN55022 (CISPR Pub.22) class B AS/NZS 3548 class B

1.2.9 CE Marking

220 to 240 V Version

Low Voltage Directive 73/23/EEC: EN60950

EMC Directive 89/336/EEC: EN55022 Class B
EN61000-3-2
EN61000-3-3
EN50082-1
IEC801-2
IEC801-3
IEC801-4

1.3 Interface Specifications

A parallel interface is standard on all three printers.

1.3.1 Parallel Interface (Forward Channel)

Transmission mode	8-bit parallel, IEEE-1284 compatibility mode
Synchronization	STROBE pulse
Handshaking	BUSY and $\overline{\text{ACKLG}}$ signals
Signal level	TTL-compatible level
Adaptable connector	57-30360 (Amphenol) or equivalent

The BUSY signal is set high before setting either $\overline{\text{ERROR}}$ low or PE high, and remains high until these signals return to their inactive state.

The BUSY signal is HIGH at these times:

- During data entry
- When the input data buffer is full
- When the $\overline{\text{INIT}}$ signal is LOW, or during hardware initialization
- When there is a printer error (See $\overline{\text{ERROR}}$ signal)

The $\overline{\text{ERROR}}$ signal is LOW when the printer is in one of the following states.

- Printer hardware error (fatal error)
- Paper-out error
- Paper-jam error
- Ink-out error

The PE signal is HIGH during a paper-out error.

Table 1-10 on the following page shows the signal and connector pin assignments for the parallel interface. With these signals, a twisted pair line is used and the return side is connected to the GND signal.

NOTE: *The forward channel is the mode used to send ordinary data, such as when a print command is sent from the computer to the printer.*

Table 1-10. Signal and Connector Pin Assignments for the Parallel Interface

Pin No.	Signal Name	Return GND Pin	In/Out	Functional Description
1	$\overline{\text{STROBE}}$	19	In	The strobe pulse. Data is read in at the falling edge of this pulse.
2 to 9	DATA0 to DATA7	20 to 27	In	The DATA0 through DATA7 signals represent data bits 0 through 7. Each signal is at a HIGH level when data is logical 1, and at a LOW level when data is logical 0.
10	$\overline{\text{ACKNLG}}$	28	Out	This signal is a negative pulse indicating that the printer can again accept data.
11	BUSY	29	Out	A HIGH signal indicates that the printer cannot receive data.
12	PE	28	Out	A HIGH signal indicates a paper-out error.
13	SLCT	28	Out	Always HIGH when the printer is powered on.
14	$\overline{\text{AFXT}}$	30	In	Not used.
31	$\overline{\text{INIT}}$	30	In	The falling edge of a negative pulse or a LOW signal on this line causes the printer to initialize. Minimum 50 µs pulse is necessary.
32	$\overline{\text{ERROR}}$	29	Out	A LOW signal indicates a printer error condition.
36	$\overline{\text{SLIN}}$	30	In	Not used.
18	Logic-H	—	Out	Pulled up to +5 V via 3.9K ohm resistor.
35	+5V	—	Out	Pulled up to +5 V via 3.3K ohm resistor.
17	Chassis GND	—	—	Chassis ground.
16,33, 19 to 30	GND	—	—	Signal ground.
15,34	NC	—	—	Not connected.

Notes: *In and Out refer to the direction of signal flow from the printer's point of view. An overscore above a signal name means that the signal is active LOW.*

1.3.2 Parallel Interface (Reverse Channel)

Transmission mode: IEEE-1284 nibble mode
Synchronization: Refer to the IEEE-1284 specification
Handshaking: Refer to the IEEE-1284 specification
Data transmission timing: Refer to the IEEE-1284 specification
Signal level: IEEE-1284 level 1 device
TTL-compatible level
Adaptable connector: 57-30360 (Amphenol) or equivalent
Extensibility request: The printer responds affirmatively when the extensibility request values are 00H or 04H, which means:

- 00H: Request nibble mode reverse channel transfer.
- 04H: Request device ID; return data using nibble mode reverse channel transfer.

NOTE: *The printer sends following device ID string when requested.*

Table 1-11. Details of Device ID

00H	3CH	Contents
MGF	EPSON	Manufacturer
CMD	ESCPL2, BDC	Command system
MDL	Stylus COLOR 440 Stylus COLOR 640 Stylus COLOR 740	Model name
CLS	PRINTER	Class

NOTES: *1. [00H] denotes a hexadecimal value of zero.*

2. The MDL value depends on the EEPROM setting. The model name can be changed by changing an address in the EEPROM.

Table 1-12 shows pin assignments for the reverse channel. (Reverse channel is the mode in which all data is transferred from the printer to the computer.) For these signals, a twisted pair line is used, and the return side is connected to the signal GND.

Table 1-12. Pin Assignments for Reverse Channel

Pin No.	Signal Name	Return GND Pin	In/Out	Functional Description
1	HostClk	19	In	Host clock signal.
2 to 9	Data0 to Data7	20 to 27	In	The DATA0 through DATA7 signals represent data bits 0 through 7. Each signal is at HIGH level when data is logical 1, and at a LOW level when data is logical 0. These signals are used to transfer the 1284 extensibility request values to the printer.
10	PrtClk	28	Out	Printer clock signal.
11	PtrBusy, Data Bit-3,7	29	Out	Printer busy signal and reverse channel transfer data bit 3 or 7.
12	AckData Req, DataBit-2,6	28	Out	Acknowledge data request signal and reverse channel transfer data bit 2 or 6.
13	Xflag, DataBit-1,5	28	Out	X-flag signal and reverse channel transfer data bit 1 or 5.
14	HostBusy	30	In	Host busy signal.
31	$\overline{\text{INIT}}$	30	In	Not used.
32	$\overline{\text{DataAvail}}$, DataBit-0,4	29	Out	Data available signal and reverse channel transfer data bit 0 or 4.
36	1284-Active	30	In	1284 Active Signal
18	Logic-H	—	Out	Pulled up to +5 V via 3.9K ohm resistor.
35	+5 V	—	Out	Pulled up to +5 V via 3.3K ohm resistor.
17	Chassis GND	—	—	Chassis ground.
16,33, 19 to 30	GND	—	—	Signal ground.
15,34	NC	—	—	Not connected.

Notes: *In/Out refers to the direction of signal flow from the printer's point of view.*
An overscore above a signal name means that signal is active LOW.

The following are general notes on the parallel interface:

- The Return GND Pin column in Tables 1-10 and 1-12 indicates a twisted pair return, and is used for all control signals except Logic-H, +5 V, Chassis GND, and NC. The return side is connected to GND (pins 16, 33, and 19 to 30) in the twisted pair return. Since these cables are shielded, you can reduce electrostatic noise by connecting them to Chassis GND in both the printer and computer.
- Interface conditions are based on TTL logic levels. Rise and fall times should be less than 0.2μs.
- See Figure 1-9 for the transmission timing of each signal.
- Be sure to perform data transmission only after confirming that the ACKNLG and BUSY signals are LOW.
- You can perform a print test without using external equipment. Set the 8-bit data signals (pins 20 through 27) to the appropriate word code and connect them to the ACKNLG and STROBE signals.

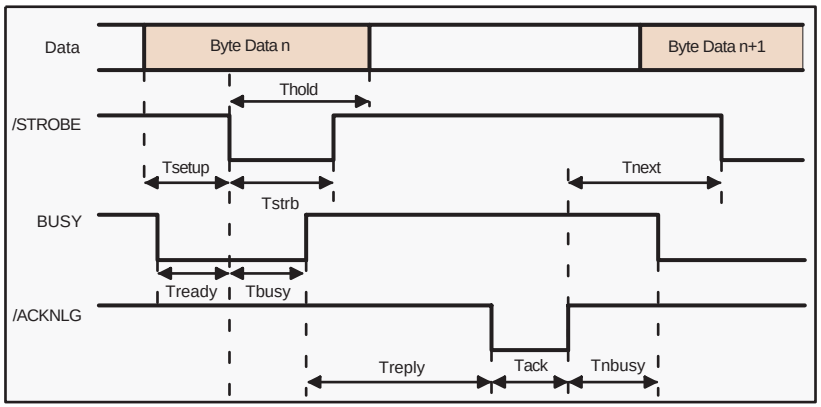


Figure 1-9. Data Transmission Timing for the Forward Channel

Table 1-13.

Maximum and Minimum Timing for Data Transmission

Parameter	Minimum	Maximum
tsetup	500ns	—
thold	500ns	—
tstb	500ns	—
tready	0	—
tbusy	—	500ns
tt-out*	—	120ns
tt-in**	—	200ns
treply	0	—
tack	500ns	10us
tnbusy	0	—
tnext	0	—

** Rise and fall time of every output signal.*

*** Rise and fall time of every input signal. Typical timing for the tack parameter is shown in Table 1-14 below.*

Table 1-14. Typical Tack Timing

Parallel Interface Mode	Typical Tack Timing
High speed	2μs (Stylus COLOR 440 and 640) 1μs (Stylus COLOR 740)
Normal speed	4μs (Stylus COLOR 440 and 640) 3μs (Stylus COLOR740)

The following tables show typical input and output signal levels for the interface (IEEE-1284 level 1 device). Signal levels are based on TTL standards.

Table 1-15. Typical Output Signal Characteristics

Parameters	Minimum	Maximum
Voltage	-0.5 V	5.5 V
Current	0.32 mA when V_{out} = 2.4 V	12 mA when V_{out} = 0.4 V
Capacitance	—	50 pF

Table 1-16. Typical Input Signal Characteristics

Parameters	Minimum	Maximum
Voltage	0.8 V	2.0 V
Current	0.32 mA when V_{in} = 2.0 V	12 mA when V_{in} = 0.8 V
Capacitance	—	50 pF

NOTE: *The input and output signals are active-high; the logic level is considered HIGH at 3.0 volts or more and LOW at 2.0 V or less. The receiver shall provide an impedance equivalent to 7.5K ohm to ground.*

1.3.2.1 Host Data Transfer Timeout Prevention

Generally, hosts abandon data transfer to peripherals when a peripheral is BUSY continuously for dozens of seconds. To prevent this kind of time-out, the printer receives data very slowly, several bytes per minute, even if it is busy. This slowdown starts when the remainder of the input buffer drops under several hundred bytes. In addition, the printer is BUSY continuously when the input buffer is full.

1.3.2.2 Interface Selection

- Manual Selection:
  One of two interfaces can be selected through the default setting mode.
- Automatic Selection (Stylus COLOR 740 only):
  Automatic interface selection is enabled in the default setting mode. In automatic interface selection mode, the printer is initialized to the idle state when it is powered on. The printer scans the interfaces to determine which interface receives data first, then selects that interface for further data transmission. When the host stops data transfer and the printer is in stand-by for several seconds, the printer returns to the idle state. The process is repeated each time the printer is powered on.

The following notes explain how the selection of one interface affects the condition of other interfaces:

- When an interface other than the parallel interface is selected, the parallel interface goes into the BUSY state. The LH signal is set to LOW, blocking the power supply and preventing a response from the 1284 Active signal. This makes it necessary for the host, which requires reverse transfer of data, to check the LH state.
- When an interface other than the serial interface is selected, the serial interface sets the DTR signal MARK.
- When the printer is initialized or returned to the idle state, the parallel interface goes into the ready state. The serial interface sets the DTR signal SPACE (LOW) and resets the off-line bit of the Main Status Register (MNSTS) to an optional interface.

1.3.3 Serial Interface (Stylus COLOR 740 only)

Standard RS-423 compatible
Synchronization Synchronous
Bit rate Approximately 1800 Kbps
Handshaking X-ON/X-OFF, DTR protocol
Word format Data Bit= 8 bits
Parity Bit= None
Start Bit= 1 bit
Stop Bit= 1 bit
Connector 8-pin mini-circular connector
Cable Apple System Peripheral-8 Cable (recommended)

Table 1-17. Connector Pin Assignments for the Serial Interface

Pin No.	Signal Name	I/O	Functional Description
1	SCLK	Out	Synchronous clock signal
2	CTS	In	Clear to send
3	TXD-	Out	Transmit data (-)
4	SG	In	Signal ground
5	RXD-	In	Receive data (-)
6	TXD+	Out	Balanced transmit data (+)
7	DTR	Out	Data terminal ready
8	RXD+	In	Balanced receive data (+)

Table 1-18. X-On/X-Off and DTR Status

State	Buffer Space	X-ON/X-OFF	DTR
Busy	Less than 3072 bytes	Send X-OFF code	OFF
Ready	More than 5120 bytes	Send X-ON code	ON

1.3.3.1 USB Interface (Stylus COLOR 740 only)

Standard Universal Serial Bus Specifications Rev. 1.0
Universal Serial Bus Device Class Definition for Printing Device Version 1.0
Bit rate 12 Mbps
Data encoding NRZI
Connector USB Series B
Cable length 2 meters (recommended)

Table 1-19. Connector Pin Assignments for the USB Interface

Pin No.	Signal Name	I/O	Functional Description
1	VCC	—	Cable power; maximum power consumption is 100 mA
2	-Data	Bi-D	Data
3	+Data	Bi-D	Data; pulled up to +3.3 V via a 1.5K ohm resistor
4	Ground	—	Cable ground

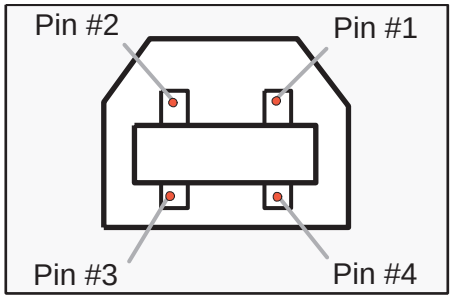


Figure 1-10. USB Pin Assignments

1.4 Control Panel

Since the printer drivers for the Stylus COLOR 440, 640, and 740 control many settings and functions, these printers do not require many control buttons. There are two non-lock type buttons, one lock type button, and four LEDs. Figure 1-11 shows the layout of the control panels.

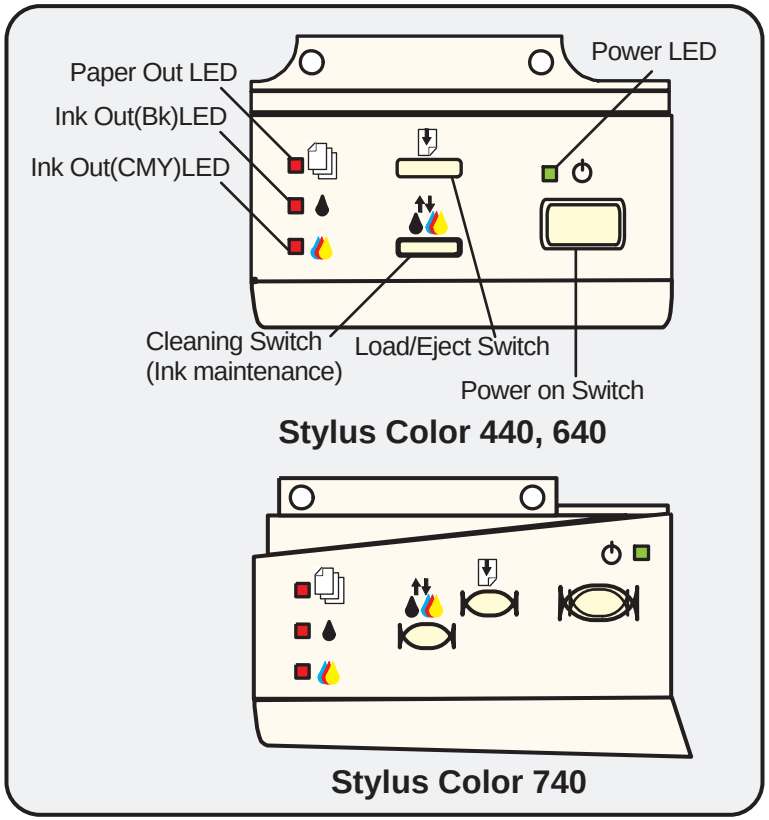


Figure 1-11. Control Panels

1.4.1 Indicators (LEDs)

(1) Power
Lights when the Operate switch is ON and AC power is supplied, and flashes when the printer is receiving data or performing a maintenance operation such as cleaning the printhead.

(2) Paper Out
Lights when the printer is out of paper, and flashes when there is a paper jam.

(3) Black Ink Out
Lights when the black ink cartridge is out of ink, and flashes when ink is low.

(4) Color Ink Out
Lights when the color ink cartridge is out of ink, and flashes when ink is low.

1.4.2 Control Panel Functions

Tables 1-19 through 1-21 describe control panel functions.

Table 1-20. Control Panel Functions during Normal Printer Use

Button	Function
Load/Eject (Hold at least 2 seconds)	1. Starts the ink cartridge replacement sequence.
Load/Eject (Press for less than 2 seconds.)	1. Loads or ejects the paper. 2. If the cartridge is in the ink change position, returns it to the capping position.
Cleaning (Hold at least 2 seconds)	1. Starts the printhead cleaning sequence. 2. When the printer is low on ink or out of ink (either cartridge), starts the ink cartridge replacement sequence.
Cleaning (Press for less than 2 seconds)	1. If the carriage is in the ink cartridge change position, returns it to the capping position.

Table 1-21. Control Panel Functions at Power On

Switch	Function
Load/Eject	1. Starts status printing. 1
Cleaning	**Stylus COLOR 440 and 640:** Changes the code page. 2 **Stylus COLOR 740:** Enters the default setting mode. 3
Load/Eject + Cleaning	Enters the EEPROM Reset mode. (The Load/Eject LED flashes for a few seconds.) (Used only to clear a maintenance error.)

NOTES:
1. *Prints the firmware version, ink counter value, and nozzle check pattern.*
2. *Code pages for the Stylus COLOR 440 and 640 are not available.*
3. *The user can use the parameter list to select settings for both the standard and NLSP version of the Stylus COLOR 740.*

Table 1-22. Control Panel Functions in the EEPROM Reset Mode

Button	Function
Cleaning	Resets the EEPROM. 1. After the Load/Eject LED has been flashing for about 2 seconds, press and hold down the Cleaning button for 10 seconds. Stylus COLOR 440 and 640 After 10 seconds, both the Black Ink Out and Color Ink Out LEDs come **ON** simultaneously. Stylus COLOR 740 After 10 seconds, the Load/Eject, Black Ink Out and Color Ink Out LEDs all **flash** simultaneously. 2. Do one of the following: Stylus COLOR 440 and 640 After you confirm that both the Black Ink Out and Color Ink Out LEDs are **ON**, release the Cleaning button. The printer resets certain addresses in the EEPROM as it begins the initialization process. Stylus COLOR 740 After you confirm that all 3 LEDs are **flashing**, release the Cleaning button. The printer resets certain addresses in the EEPROM as it begins the initialization process.

NOTES:
1. *Before you press the Load / Eject button, be sure you are in EEPROM reset mode (see Table 1-20)*
2. *The following addresses are reset in EEPROM Reset Mode: timer IC (power-off timer), ink counter, and interface selection (interface selection is reset to Auto)*
3. *If you repeat the EEPROM reset operation, it resets the EEPROM addresses but does not necessarily initialize the EEPROM. Whether or not the EEPROM is initialized depends on the power-off time monitored by the timer IC.*

1.4.3 LED Indicators and Printer States

Table 1-23 describes the appearance of the LED indicators during various printer states. You can use the table below to determine the nature of a printer problem and how to solve it.

Table 1-23. Printer Condition and LED Status

Printer State	Indicator Status				Priority
	Power	Ink Out (Black)	Ink Out (Color)	Paper Out	
Power on	—	—	—	—	9
Ink sequence mode	On	—	—	—	6
Ink cartridge replacement mode	Flashing	—	—	—	5
Data processing	Flashing	—	—	—	8
Paper out	Flashing	—	—	On	4
Paper jam	—	—	—	Flashing	3
No ink cartridge or ink out (black)	—	On	—	—	7
Ink low (black)	—	Flashing	—	—	7
No ink cartridge or ink out (color)	—	—	On	—	7
Ink low (color)	—	—	Flashing	—	7
Enter EEPROM reset	—	ON (for 3 seconds)			—
Maintenance request	Flashing	Flashing	Flashing	Flashing	2
Fatal error	Flashing	On	On	Flashing	1

1.5 Error Conditions

When the error conditions described in the following sections occur, the printer stops accepting data, sets the interface $\overline{\text{ERROR}}$ signal to LOW and the Busy signal to HIGH, and stops printing. See Section 1.4.3 for information on the status of the LED indicators during various error states.

1.5.1 Ink Out

When the printer is almost out of any color of ink, the appropriate Ink Out indicator (black or color) flashes and the printer keeps on printing. When the printer is out of either ink color, it stops printing and the appropriate Ink Out indicator remains on. Install a new ink cartridge at this time.

Never reinstall an ink cartridge that has been removed from the printer. Installing an old ink cartridge interferes with the printer's ink level detection capability and may cause serious printing problems.

Here's why:

1. Once the cartridge has been removed, air enters the cartridge and the printhead, and bubbles that form can prevent the printhead from discharging ink properly. On the other hand, the air that enters during installation of a new ink cartridge can be absorbed into the ink itself, since the ink in the cartridge has been de-aerated during the production process. However, the ink's ability to absorb air lasts for only about one hour after the cartridge has been installed.
2. As long as the ink cartridge remains installed in the printer, air cannot enter the printhead. However, if an old ink cartridge is removed from the printer, any air entering the cartridge can never be fully absorbed into the ink. As a result, the ink will thicken and bubbles will form. If thickened ink gets into the printhead, it can clog the ink path or nozzle and cause serious printhead damage.
3. Normally, the ink consumption counter is reset when the ink cartridge is removed. If an ink cartridge is removed and reinstalled unnecessarily, the ink consumption counter will have the wrong value, and the printer may keep printing even though the inkstalled ink cartridge is empty. This can damage the printhead.

1.5.2 Paper Out

When the printer is printing and fails to load a sheet of paper after all power-on operations (including timer clearing) are done, or after you press the Load/Eject button and the paper fails to load, the printer indicates a paper out error.

1.5.3 Paper Jam

When the printer cannot eject a sheet of paper after printing, or when the Load/Eject button on the control panel is pressed, the printer indicates a paper jam error.

1.5.4 No Ink Cartridge

The following can be reasons for the printer to indicate a No Ink Cartridge error:

1. The printer is being turned on for the first time. This is a normal condition, and the printer clears the error state as soon as an ink cartridge is installed.

2. Ink cartridge replacement is performed incorrectly. This error may occur if the carriage is moved during the cartridge replacement procedure, or if the carriage returns to the home position before the cartridge is installed. When ink cartridge replacement is performed again correctly, the printer clears the error condition.

3. There is a problem with the carriage sensor or with the printer itself. If the error occurs when the ink cartridge has been installed correctly, or if the printer sometimes prints normally and sometimes indicates a No Ink Cartridge error, the CR sensor or printer may need to be repaired.

1.5.5 Maintenance Request

When the total quantity of ink released by cleaning and flushing reaches the threshold value, a maintenance request error occurs and the printer stops printing. You need to replace the waste ink pad in the printer case. A printer counter monitors the amount of ink that has been absorbed by the waste ink pad. The counter uses a point system that corresponds to the amount of ink that has been used. The maximum capacity of the waste ink pad is set at the following *maximum counter points*:

Printer	Maximum Counter Points
EPSON Stylus COLOR 440	21000
EPSON Stylus COLOR 640	19800
EPSON Stylus COLOR 740	40900

Since 1 counter point equals 0.02 ml of ink, ink capacity is set at the following:

Printer	Maximum Ink Capacity
EPSON Stylus COLOR 440	420 ml
EPSON Stylus COLOR 640	396 ml
EPSON Stylus COLOR 740	818 ml

When you print the A4 nozzle check pattern after completing repairs, the printout shows you the current value of the total ink counter and whether the ink is discharging properly from all the nozzles. Make sure that the value of the total ink counter is acceptable. If the value is too high (if it is close to or greater than the maximum value), it may be necessary to clear the EEPROM and replace the waste ink pad.

1.5.6 Fatal Errors

The following are fatal errors:

- Carriage Control Error: This error may be caused by a misaligned carriage guide shaft, a home position sensor malfunction, a timing belt tension malfunction, not enough lubricant on the carriage guide shaft, or other problems.
- CG Access Error: This error occurs if the carriage does not move to the ink cartridge replacement position during the replacement sequence.

1.6 Printer Initialization

Stylus COLOR 440, 640, and 740 have three kinds of initialization methods, as described below:

Power-on initialization

Power-on initialization occurs when you turn the printer on, or when the printer receives the cold reset command (remote RS command). Power-on initialization performs the following actions:

(a) Initializes the printer mechanism.
(b) Clears the input data buffer.
(c) Clears the print buffer.
(d) Sets the default values.

Operator initialization

Operator initialization occurs when you turn the printer on less than 10 seconds after it was turned off, or when the printer receives the INIT signal (negative pulse) from the parallel interface. Operator initialization performs the following actions:

(a) Caps the printhead.
(b) Ejects the paper.
(c) Clears the input data buffer.
(d) Clears the print buffer.
(e) Sets the default values.

Software initialization

Software initialization occurs when the printer receives the ESC @ command. Software initialization performs the following actions:

(a) Clears the print buffer.
(b) Sets the default values.

1.7 Initialization Settings

The settings below take effect when the Stylus COLOR 440, 640, or 740 are initialized. If the user changes any settings using the control panel buttons, the Default Setting mode, or remote commands, those settings will take effect instead of the factory settings.

- ❑ Page position: Page heading location for current page
- ❑ Line spacing: 1/6 inch
- ❑ Right margin position: 80 lines
- ❑ Left margin position: First line
- ❑ Character pitch: 10 cpi
- ❑ Printing mode: Text mode (not raster graphics mode)

1.8 Main Components

The main components of the Stylus COLOR 440, 640, and 740 are listed below. (Note that the bottom of the printer mechanism serves as the lower housing for all three printers.)

1) Upper housing

2) Printer mechanism

3) Main control board
   - Stylus COLOR 440: C206 MAIN-B board, C255 MAIN board *
   - Stylus COLOR 640: C256 MAIN board
   - Stylus COLOR 740: C257 MAIN board

4) Power supply board
   - Stylus COLOR 440: C206 PSB/PSE board
   - Stylus COLOR 640: C206 PSB/PSE board
   - Stylus COLOR 740: C257 PSB/PSE board

5) Control panel board
   - Stylus COLOR 440: C206 PNL board
   - Stylus COLOR 640: C206 PNL board
   - Stylus COLOR 740: C209 PNL board

* The C255 MAIN board will eventually replace the C206 MAIN-B.

1.8.1 Printer Mechanism

Like the printer mechanism for earlier printers such as the Stylus COLOR 600, the paper feed (PF) motor drives both the paper feed mechanism and the ink pump. However, the ink pump operates only when the carriage is in its home position and the PF motor is turning the appropriate direction.

Another important feature is that the printhead is one unit, combining both black and color ink nozzles.

1.8.2 C206 MAIN-B Board (Stylus COLOR 440)

The C206 MAIN-B board controls the operation of the printer mechanism and data processing operations for the Stylus COLOR 440. This board will eventually be replaced by the C255 MAIN board.

The C206 MAIN-B board consists of the following major components:

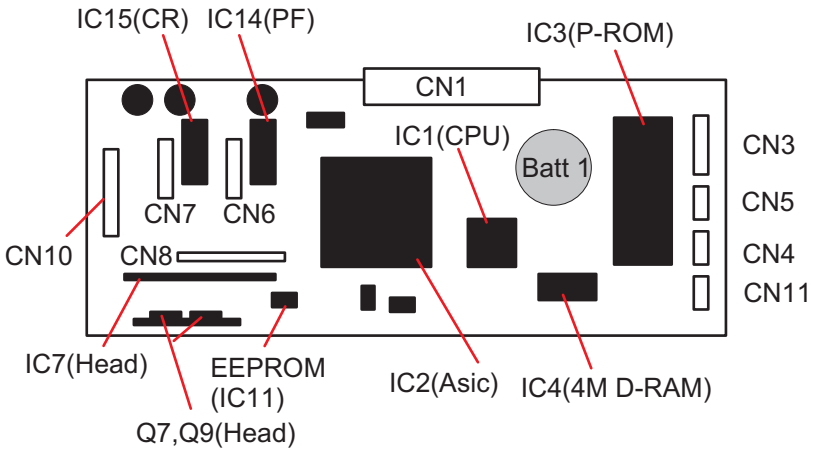


Figure 1-12. C206 MAIN-B board

1.8.3 C256 MAIN Board (Stylus COLOR 640)

The C256 MAIN board controls the operation of the printer mechanism and data processing operations for the Stylus COLOR 640. It consists of the following major components.

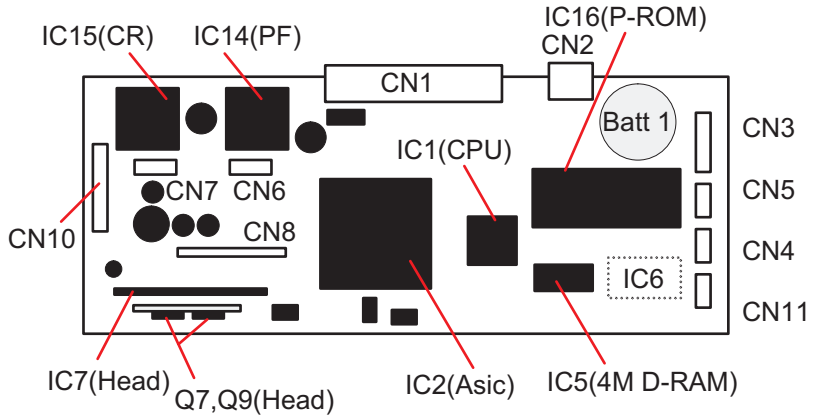


Figure 1-13. C256 MAIN board

1.8.4 C257 MAIN Board (Stylus COLOR 740)

The C257 MAIN board controls the operation of the printer mechanism and data processing operations for the Stylus COLOR 640. It consists of the following major components.

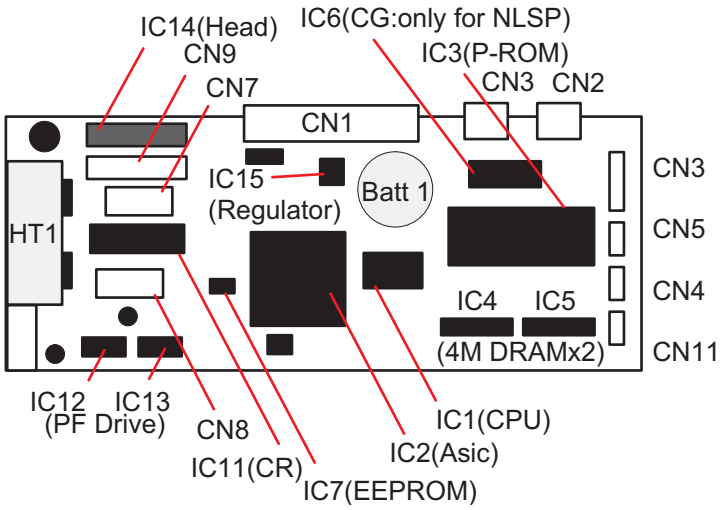


Figure 1-14. C257 MAIN Board

1.8.5 Power Supply Board C206 PSB/PSE (Stylus COLOR 440 and 640) C257 PSB/PSE (Stylus COLOR 740)

The power supply boards for the Stylus COLOR 440, 640 and 740 employ a switching regulator method to supply stable logic and power voltages. Because these boards contain a time delay circuit, electricity can be supplied to the printer for at least 30 seconds after power is turned off. Therefore, even when the user makes a mistake (for example, turns off power in the middle of a print job), this mechanism ensures that the printhead is capped and prevents ink from clogging the nozzle plate.

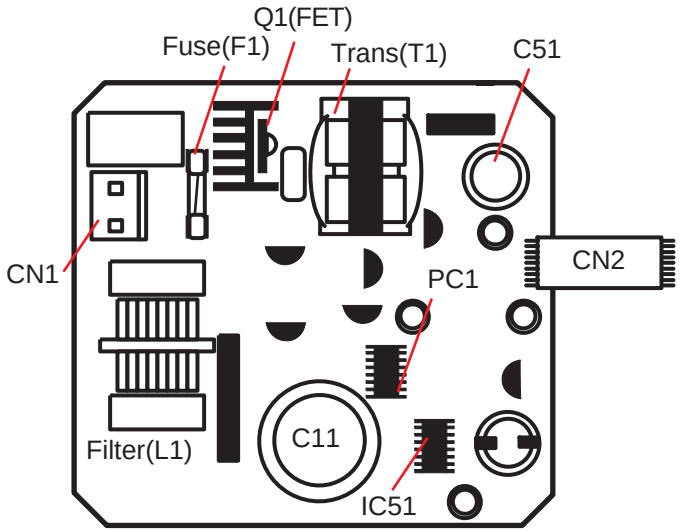


Figure 1-15. C206/C257 PSB/PSE board

1.8.6 C206 PNL Board (Stylus COLOR 440 and 640)

The C206 PNL (panel) board is located in the panel housing on the front of the printer. It consists of 3 buttons, 4 LEDs, and 1 connector.

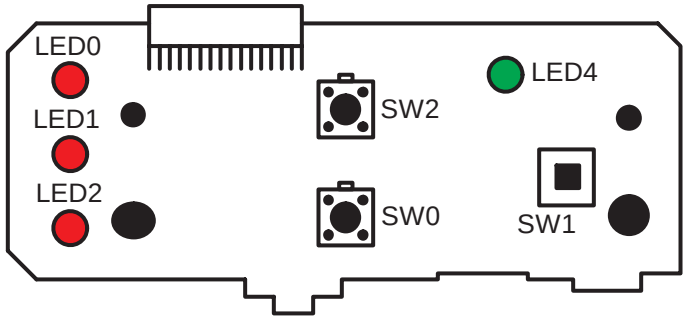


Figure 1-16. C206 PNL board

1.8.7 C209 PNL Board (Stylus COLOR 740)

The C209 PNL (panel) board is located in the panel housing on the front of the printer. It consists of 3 buttons, 4 LEDs, and 1 connector.

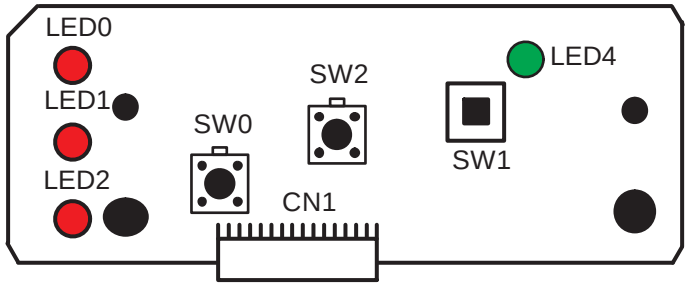


Figure 1-17. C209 PNL Board

CHAPTER

2

OPERATING PRINCIPLES

2.1 Printer Mechanism

The printer mechanism includes all the mechanical components that enable printing to take place. These components include the printhead (PH) and carriage (CR) unit, the paper feed (PF) and paper eject rollers, the auto-sheet feeder (ASF), and the pump unit which is used in printhead cleaning operations.

Like some previous versions of EPSON ink jet printers, the paper feed motor in the Stylus COLOR 440, 640, and 740 is used not only for paper feeding, but also to pump ink and drive the auto-sheet feeder. The direction of the paper feed motor, along with the position of the carriage, determines which operations are performed. Figure 2-1 shows how the main components of the printer mechanism interact.

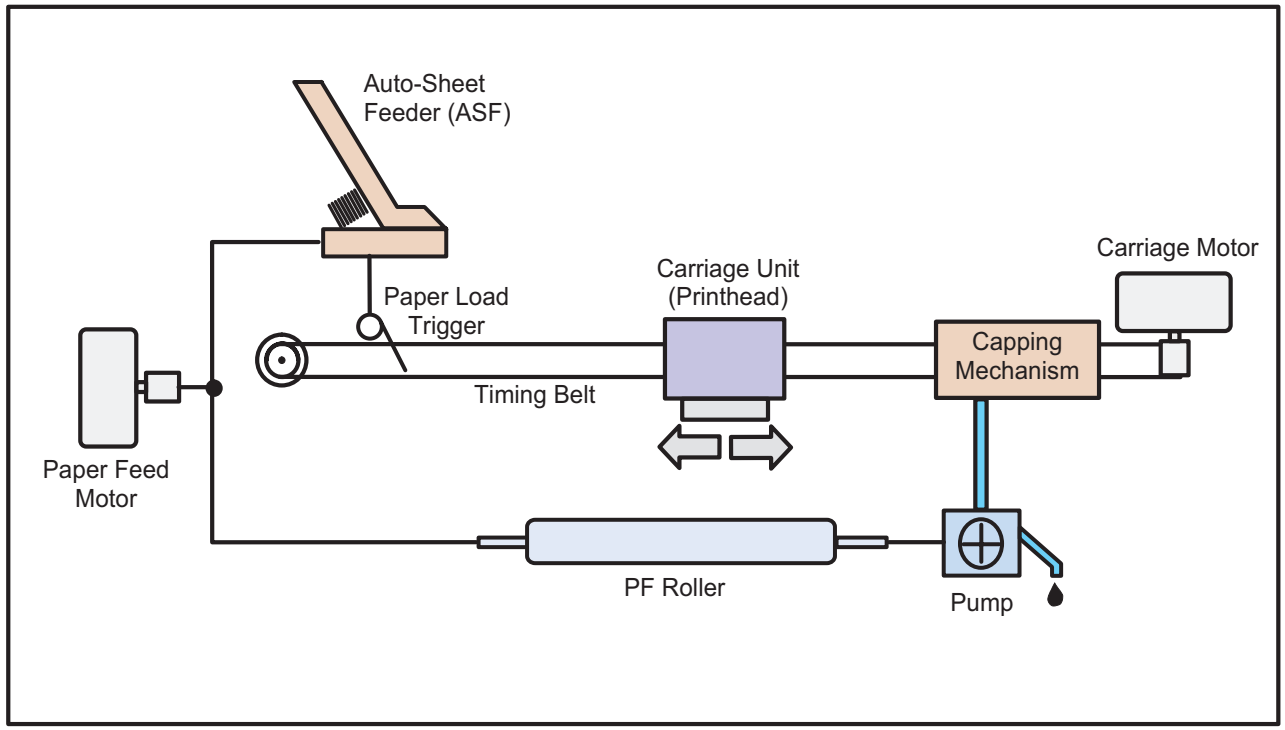


Figure 2-1. Printer Mechanism Block Diagram

2.1.1 Printhead

The printhead of the Stylus COLOR 440, 640, and 740 combines the black and CMY (Cyan, Magenta, Yellow) heads in one unit. As shown below, the nozzle configurations are different for each model:

- Stylus COLOR 440:
  Black Nozzle: 64 nozzles (90 dpi x 2 rows staggered)
  CMY Nozzle: 21 nozzles per color (90 dpi x 1 row)
- Stylus COLOR 640:
  Black Nozzle: 64 nozzles (90 dpi x 2 rows staggered)
  CMY Nozzle: 32 nozzles per color (90 dpi x 1 row)
- Stylus COLOR 740:
  Black Nozzle: 144 nozzles (120 dpi x 3 rows staggered)
  CMY Nozzle: 48 nozzles per color (120 dpi x 1 row

The Stylus COLOR 640 and 740 print at the highest resolution (720 x 1440 dpi), while the Stylus Color 440 prints at 720 x 720 dpi.

The printhead uses an on-demand MACH-type ink delivery system. Refer to Figure 1-1, Figure 1-2, and Figure 1-3 for the nozzle configuration. In order to correct manufacturing variations in the piezo elements used for ejecting ink from the nozzles, you must input the head voltage ID to the printer whenever you replace the printhead, main board, or printer mechanism. The head voltage ID is marked on the side of the printhead, and is stored in the EEPROM on the printer's main board. You can input the ID to the printer by using the adjustment program described in "Using the Adjustment Program" in Chapter 5, *Adjustments*.

Printing Process

In Figure 2-2, the ink cartridge sensor detects the presence of the ink cartridge; note that the sensor's position differs between models. After ink flows out of the cartridge through the needle, it passes through a filter. The filter prevents dust or dirt from clogging the ink nozzles and causing missing dots or ink deflection. The ink cavity then stores the ink until it is ready to be discharged. This is accomplished by piezo electric elements (PZTs). In response to signals from the driver on the main board, the PZTs compress the top of the ink cavity, causing ink to eject through the nozzle plate on the bottom of the printhead.

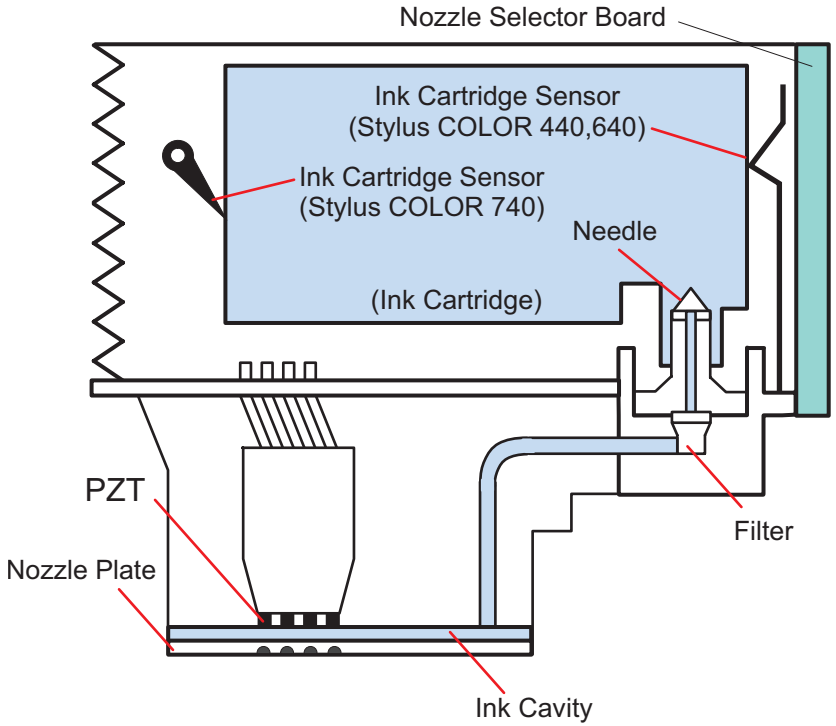


Figure 2-2. Printhead Sectional Drawing

The following figures show sectional drawings of the printhead while waiting to print and during printing (normal state and ejecting state).

- **Normal State:**
  During the normal state, the PZT elements do not move and ink fills the ducts between the ink cavity and the nozzles. (Refer to Figure 2-3.)

- **Ejecting State:**
  The printhead is designed to operate at a high frequency, and goes through thousands of print cycles each second. During each print cycle, the main board transmits data to the nozzle selector IC (IR2C72C), which is located on the printhead. This data determines which PZTs are to be actuated in the current cycle. At the same time, the main board generates a high-frequency drive voltage. During each print cycle, the nozzle selector applies this drive voltage to specific PZTs, as determined by the print data. This causes ink to eject from the nozzles in a specific pattern. (See Figure 2-4.)

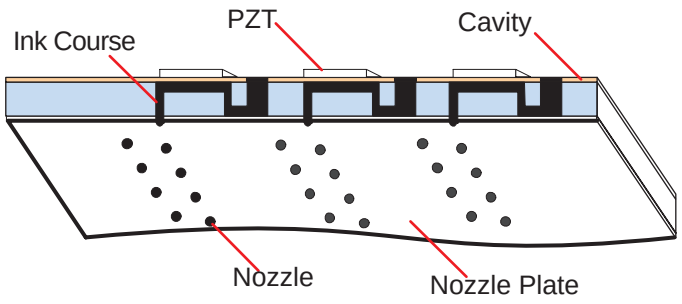


Figure 2-3. Printhead - Normal State

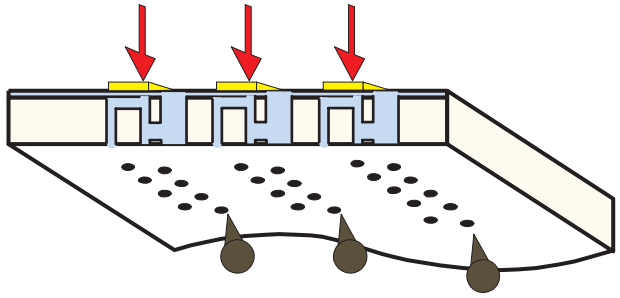


Figure 2-4. Printhead - Ejecting State

2.1.2 Carriage Mechanism

The carriage (CR) motor moves the carriage, which holds the printhead, along the carriage guide shaft. Unlike the paper feed motor, the carriage motor is capable of Micro-Step control. (This means it can advance the carriage in increments of 1/360 of an inch.) The carriage motor is a 4-phase, 200-pole stepper motor. Its specifications are shown in the table below.

Table 2-1. Carriage Motor Specifications

Items	Description
Motor type	4-phase/200-pole stepper motor
Drive voltage	42 VDC ± 5%
Internal coil resistance	7.8 ohms ± 10% (per phase under 25 °C environment)
Driving speed (frequency)	5 cps (60 Hz) to 340 cps (4080 Hz)
Control method	Bi-polar drive

The carriage motor for the Stylus COLOR 440 and 640 is driven by 1-2, 2-2, and W1-2 phase drive methods. The Stylus COLOR 740 uses 2-2, 1-2, W1-2, 2W1-2, and 4W1-2 phase drive methods. Different phase drive methods are used for different printer functions, as shown below.

Table 2-2. Phase Drive Methods (Stylus COLOR 440, 640)

Printer function	Drive Speed [CPS]	Drive frequency [PPS]	Drive method
High-speed skip	340	4080	W1-2, 2-2,1-2 phase drive
Normal printing	200	2400	W1-2, 2-2 phase drive
Capping	80	960	W1-2, 2-2 phase drive
Wiping	40	480	W1-2, 2-2 phase drive
Opening the bleed valve	20	240	W1-2, 2-2 phase drive
Uncapping	5	60	W1-2, 2-2 phase drive

Table 2-3. Phase Drive Methods (Stylus COLOR 740)

Printing mode	Drive Speed [CPS]	Drive frequency [PPS]	Drive method
High-speed skip	340	4080	W1-2, 2-2,1-2 phase drive*
Normal printing	200	2400	W1-2, 2-2 phase drive
Capping	80	960	2W1-2, 2-2 phase drive
Wiping	40	480	2W1-2, 2-2 phase drive
Opening the bleed valve	20	240	4W1-2, 2-2 phase drive
Uncapping	5	60	4W1-2, 2-2 phase drive

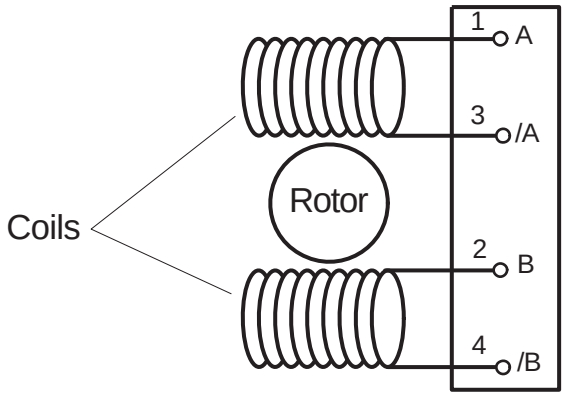


Figure 2-5. CR Motor Circuit Diagram

2.1.3 Platen Gap and Parallelism Adjustment Mechanisms

The platen gap (PG) adjustment lever changes the distance between the printhead and the platen. (See Figure 2-6.) The distance can vary between 1.04 mm and 1.74 mm. Normally, the lever is kept in the forward position, or narrow gap setting. In case of problems during printing, such as paper curl, the user can move the lever toward the rear to increase the gap.

Table 2-4. Platen Gap Adjustment Lever Settings

Paper	Lever Position	PG adjustment value
All media	Front	0 mm (1.04 mm between head and platen)
If you experience print problems	Rear	0.7 mm (1.74 mm between head and platen)

The parallelism adjustment levers, mounted on the left and right ends of the carriage guide shaft, adjust alignment between the platen and the guide shaft. Parallelism must be checked and adjusted whenever a new guide shaft is installed on the printer mechanism, whether during the production process or repair. For details, see "Parallelism Adjustment" in Chapter 5, *Adjustments*.

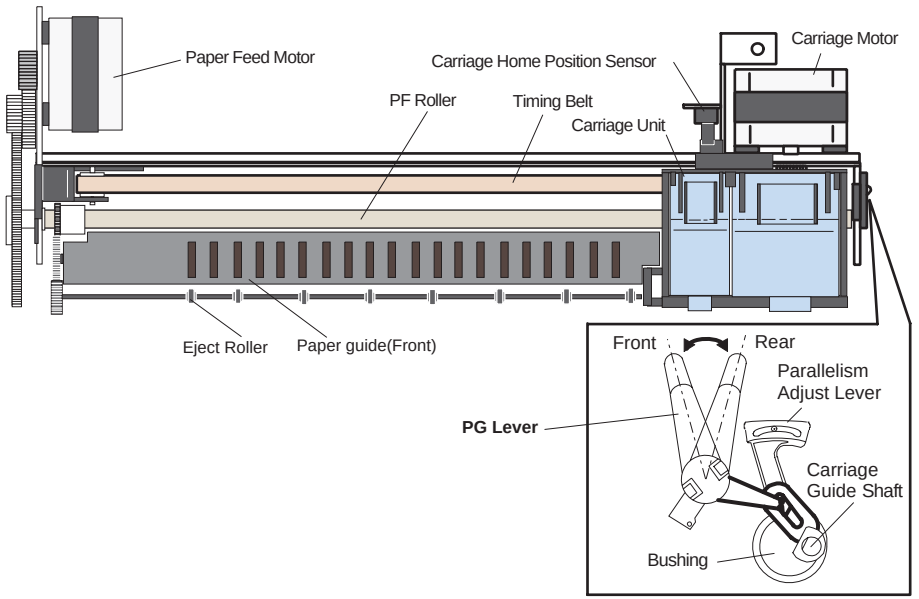


Figure 2-6. Carriage Mechanism (Top View)

2.1.4 Carriage Lock Mechanism

The carriage lock mechanism prevents the printhead from becoming uncapped, which could happen because of vibration during transport or mishandling by users. If the printhead is uncapped for a long time, ink on the printhead surface dries out and becomes thick. This can keep the nozzle from discharging ink. To prevent this, the printer locks the carriage under the following conditions:

- **After power-off:**
  If the power is turned off during printing or any other operation, the printer initializes and then locks the carriage in the home position.
- **After power-on:**
  The printer locks the carriage after the power is turned on and automatic power-on cleaning is completed.
- **After ejecting the paper:**
  If the Load/Eject button is pressed during printing and no further data is being received by the printer, the printer ejects the paper, locks the carriage, and goes into standby. However, if the Load/Eject button is pressed for paper loading only, the printer does not perform a carriage lock.

2.1.5 Paper Feed Motor

The paper feed (PF) motor powers not only the paper feed mechanism, but also the pump mechanism that is used for printhead cleaning. The type of motor used is a 4-phase hybrid pulse motor. This makes it possible to use the same motor to perform both high- and low-speed operations for a variety of paper feeding and ink pumping tasks.

The PF motor for the Stylus COLOR 440 and 640 uses 2-2 and 1-2 phase drive methods, whereas the Stylus COLOR 740 uses 2W1-2, W1-2, 1-2 and 2-2 phase drive methods. The following tables show the PF motor specifications.

Table 2-5. PF Motor Specifications (Stylus Color 440, 640)

Item	Description
Motor type	4-phase/48-pole stepper motor
Drive voltage	42 VDC ± 5%
Coil resistance	7 ohms ± 10% (each coil, at 25 °C)
Drive frequency	100 to 1990 Hz
Control method	Bi-polar drive

Table 2-6. PF Motor Specifications (Stylus Color 740)

Item	Description
Motor type	4-phase/200-pole stepper motor
Drive voltage	42 VDC ± 5%
Coil resistance	8.8 ohms ± 10% (each coil, at 25 °C)
Drive frequency	100 to 3240 Hz
Control method	Bi-polar drive

2.1.6 Paper Handling

Paper handling on the Stylus COLOR 440, 640, and 740 is performed by the automatic sheet feeder (ASF) and paper feed mechanisms. The ASF is designed to prevent more than one sheet of paper from being fed into the printer at a time. After the ASF has introduced a single sheet into the printer, the paper feed mechanism takes over. It manages the paper during printing, and also ejects the page when printing is complete.

Since the paper feed mechanism and ASF share the same motor, the printer needs a way of transmitting power to the ASF during loading. This is done by the ASF transmission.

ASF transmission

Normally, when the the PF motor is running, it turns only the gears on the right-hand side of the ASF transmission, as shown in Figure 2-7. These gears include the PF roller drive gear and the eject roller drive gear, which are both parts of the paper feed mechanism.

When the Load/Eject switch is pressed or the printer receives instructions to load a new sheet of paper, the carriage unit moves all the way to the left and presses against the sheet feeder clutch. The clutch then pushes against the sliding gear, which is mounted on the same axle as the platen roller drive gear. This causes the sliding gear to mesh with the ASF roller transmission gears. In this way, the PF motor drives the ASF during paper loading.

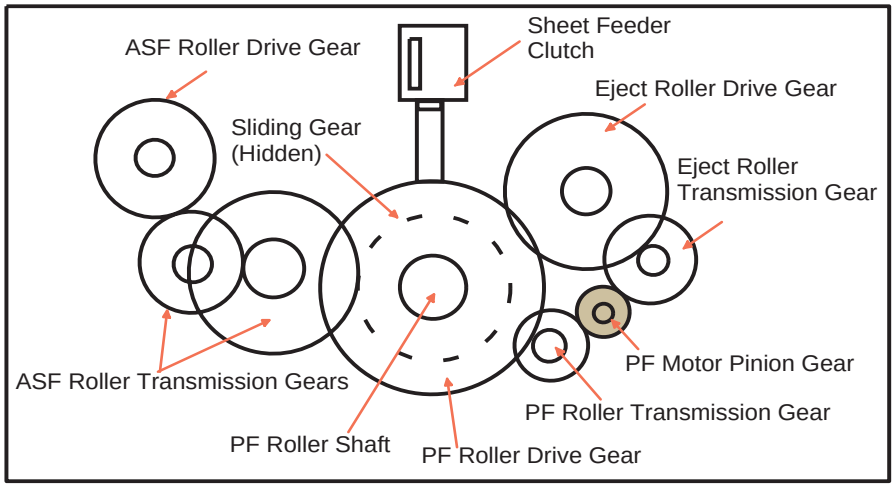


Figure 2-7. ASF Transmission

Automatic Sheet Feeder (ASF)

When the user sets a stack of paper in the printer, it rests on top of the upper ledge of the *pad*, shown in Figure 2-8. The stack remains on the pad while individual sheets are fed into the paper path. Sometimes, however, more than one sheet of paper slips into the paper path during printing. If this is not corrected, it can cause paper to jam when the printer tries to load the next sheet of paper. To prevent this, the PF motor rotates backwards at the beginning of each paper feed cycle. This causes the cam to rotate counterclockwise, catch the paper return lever, and lift it upward, as shown in the figure at right. At the same time, the hopper and the pad are pushed backwards, away from the D-cut paper loading roller, leaving a gap to prevent friction with the paper. As the cam continues to rotate, any paper that has slipped into the paper path is caught by the return lever and returned to its proper position on top of the pad.

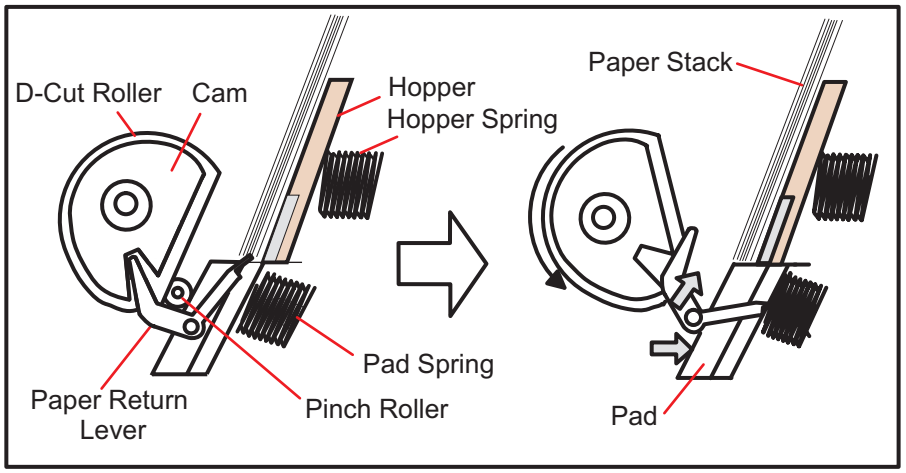


Figure 2-8. ASF Unit Operation

When the PF motor resumes normal forward motion, the cam and the D-cut roller rotate clockwise, allowing the paper return lever to move downward and clear the paper path. At the same time, the hopper and the pad move forward and press the paper against the D-cut roller. As the D-cut roller continues to turn, it draws the top sheet of paper off the stack and feeds it into the printer, until the roller has turned so that its flat side is parallel to the paper. At this point, the paper is fully loaded and only the paper pinch roller remains in contact with the paper. This is the ASF's home position. A sensor detects this position and causes the printer to disengage power from the ASF.

Paper Feed Mechanism

When the ASF loads paper into the printer, the PF and pinch rollers receive it. These rollers in turn move the paper across the platen, where printing takes place, and feed it out through the eject rollers. The top eject roller is notched and set back from the lower eject roller at a 5-degree angle toward the platen. This compensates for paper curl and allows the trailing (top) edge of the paper to pass under the printhead without bending.

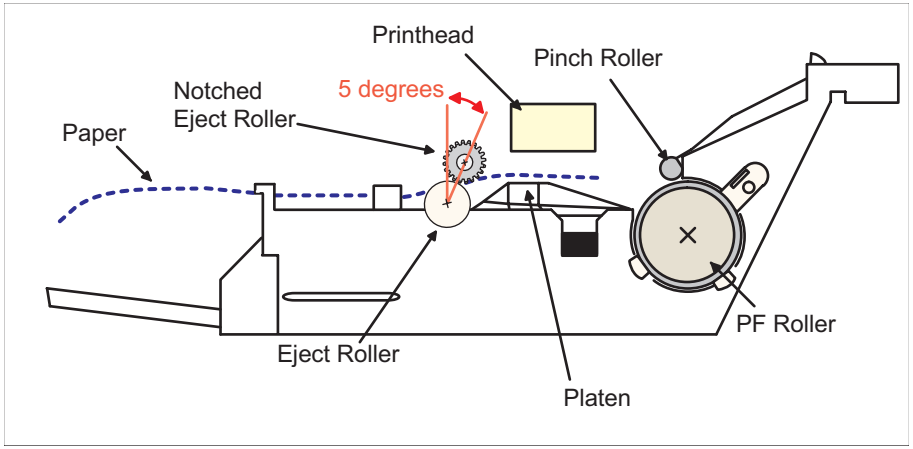


Figure 2-9. Paper Feed Mechanism

2.1.7 Ink System

The ink system consists of the following:

- ❑ink cartridge
- ❑printhead capping mechanism
- ❑carriage lock
- ❑cleaning blade
- ❑ink pump
- ❑waste ink drain pad

Although the PF motor drives both the paper feed mechanism and the ink pump, the gear linkage contains no special mechanism to disengage these systems. However, this does not mean the pump is always pumping ink. For the ink pump to operate, the printhead must be capped by the capping mechanism (to create a vacuum seal) and the PF motor must turn the pump in the appropriate direction (to engage the pump drive rollers).

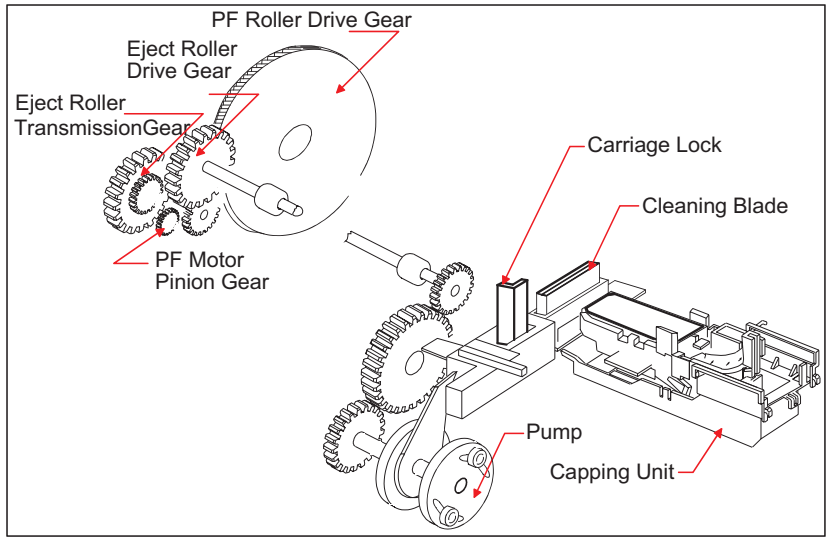


Figure 2-10. Ink System Mechanism

Head Cleaning Operations

The printer performs a variety of tasks to keep the printhead clean and to keep ink from drying out on the printhead's surface. These tasks include:

❑ Rubbing and Wiping

Rubbing and wiping are performed prior to suctioning to eliminate dust and dirt on the printhead. This helps maintain normal ink ejection and ensures that a firm seal can be obtained when the printhead is capped during suctioning.

Rubbing and wiping occur when the printhead passes over the cleaning blade, which can be extended into the path of the printhead or withdrawn out of its way. To learn how this works, see "Pump Mechanism" on page 45.

The cleaning blade is composed of two materials: felt on the left side and rubber on the right. When the carriage moves right to left, the printhead *rubs* against the rubber half of the blade. When the carriage moves left to right, the printhead *wipes* against the felt half. A small amount of ink is sent to the nozzle surface before wiping to make adhering objects come off easily.

❑ Discharging

Discharging is the electronically controlled ejection of ink from the printhead. Unlike suctioning, which uses an external pump, discharging uses the printhead's own PZTs to perform the operation. Discharging eliminates the viscous ink that forms when ink near the printhead nozzles starts drying out.

❑ Suctioning

Suctioning takes place when the printer uses the ink pump to suction ink away from the nozzles. This eliminates trapped air bubbles and prevents ink from remaining near the nozzles and drying out.

The printer performs suctioning at three different power levels. During high-power suctioning, the printhead is fully capped and the bleed valve remains closed. This gives rise to maximum suction. The printer then switches to medium-power suctioning, a sensitive operation performed with the bleed valve open. This eliminates air bubbles formed in the printhead cavity during high-power suctioning. Finally, with the bleed valve still open but the pump motor running at a lower speed, the printer performs low-power suctioning. This vacuums away any ink that remains on the nozzle plate and in the ink cap following other cleaning procedures.

The figure below shows where the carriage is positioned during the various head cleaning operations.

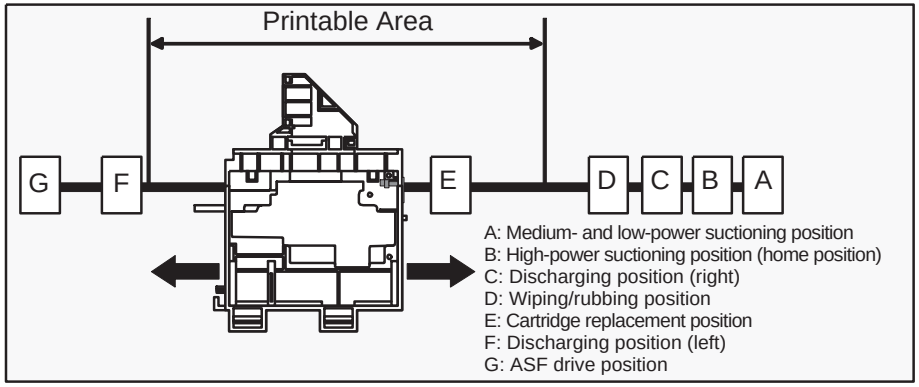


Figure 2-11. Carriage Positioning

Pump Mechanism

The pump mechanism, shown in Figure 2-12, actually performs three different functions:

- ❑ The pump itself removes ink from the ink cartridge, as part of the head cleaning operation.
- ❑ The cleaning blade removes dust and dirt from the printhead, as part of the head cleaning operation.
- ❑ The carriage lock retains the carriage in its home position, to ensure that the printhead remains capped when the printer is not in use.

The cleaning blade and the carriage lock are mounted on the same slider unit, and therefore extend or retract in tandem. The slider's motion is controlled by the slider lever, which is held against the clutch plate by a compression spring. Because the slider lever is operated by friction instead of gears, the rest of the pump mechanism can continue to turn even when the slider unit is fully extended or retracted. However, this also means that even a minor obstruction can cause the slider to stick.

The pump itself uses peristaltic compression. Rollers attached to the pump drive wheel create a vacuum in the ink drain tube by squeezing the tube along its length and forcing the ink to travel through it. This is shown in Figure 2-12 at right, and schematically in Figure 2-13 on the following page.

As mentioned above, the PF motor is the power source for both the paper feed mechanism and the pump mechanism. The PF motor powers the pump mechanism through the eject roller shaft, as shown in Figure 2-10 and Figure 2-12 at right.

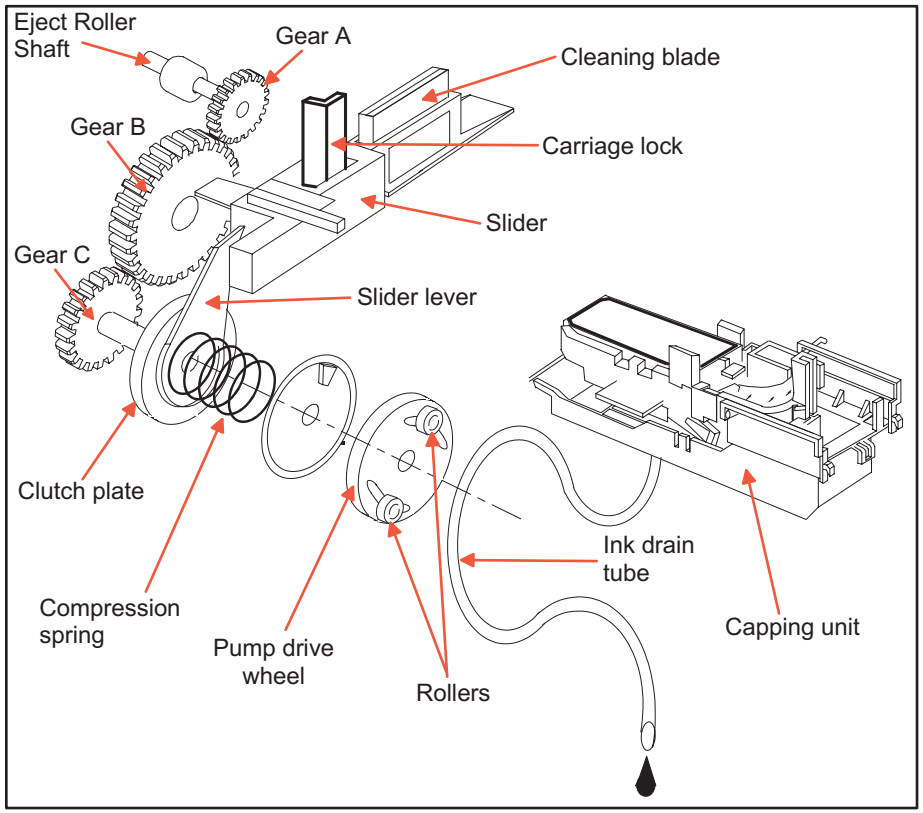


Figure 2-12. Pump Mechanism

Although economy of design results from the pump mechanism and the paper feed mechanism sharing the same motor, it is not desirable for the pump to be running every time the printer feeds paper. To overcome this problem, the operations of paper feeding and pumping are kept separate by the PF motor's direction of rotation. Since the printer feeds paper in one direction only, the other direction is reserved for running the pump.

Here's how that works: Slots in the pump's drive wheel permit two rollers to move radially inward or outward, depending on the wheel's direction of rotation. As shown in Figure 2-13, when the pump turns counterclockwise (as viewed from the left side of the printer), the rollers are forced outward to compress against the ink drain tube. This is caused by the angle of the slots and friction between the rollers and the drain tube. In this position, pumping takes place. When the pump turns clockwise (the direction of paper feeding), the rollers relax and move inward, and no pumping occurs.

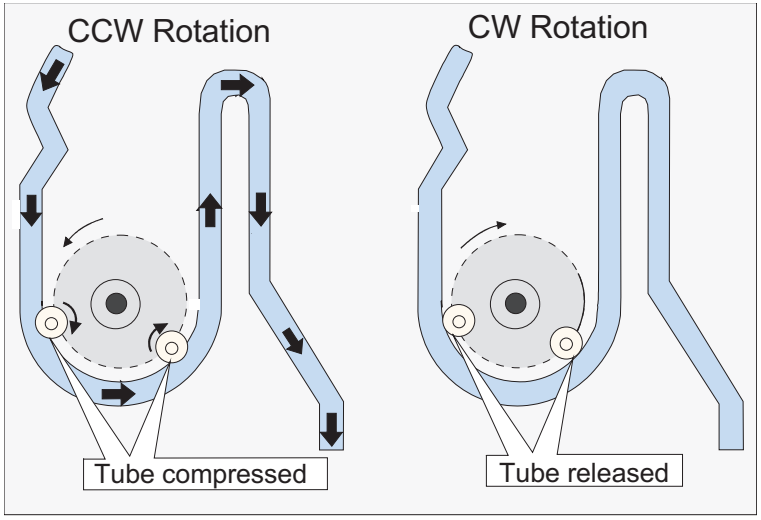


Figure 2-13. Pump Rotation

The table below summarizes the relationship between the PF motor's direction of rotation and the pump mechanism's operation.

Table 2-7. PF Motor and Pump Mechanism Functions

PF Motor Rotation	Pump Mechanism Functions
Clockwise (CW)	Pump operates Head cleaner extends Carriage lock extends
Counterclockwise (CCW)	Pump does not operate Head cleaner retracts Carriage lock retracts

For the pump to drain ink away from the cartridge, not only must the pump be running, but the printhead must be firmly seated on the printhead capping mechanism with the air bleed valve closed. The following section explains the operation of the capping mechanism.

Capping Mechanism

The capping mechanism seals the printhead when the printer is not in use. This prevents the ink from thickening due to continuous exposure to the air. Also, the capping mechanism creates a vacuum seal around the printhead, which enables ink suctioning to take place.

Included in the capping mechanism is an air bleed value. See Figure 2-14. During high-power suctioning, the bleed value is kept closed. This enables the pump to generate maximum suction. During medium- and low-power suctioning, the carriage moves all the way to the right, pushing the valve release pin against the frame of the capping mechanism. This opens the bleed valve and reduces vacuum pressure in the cap.

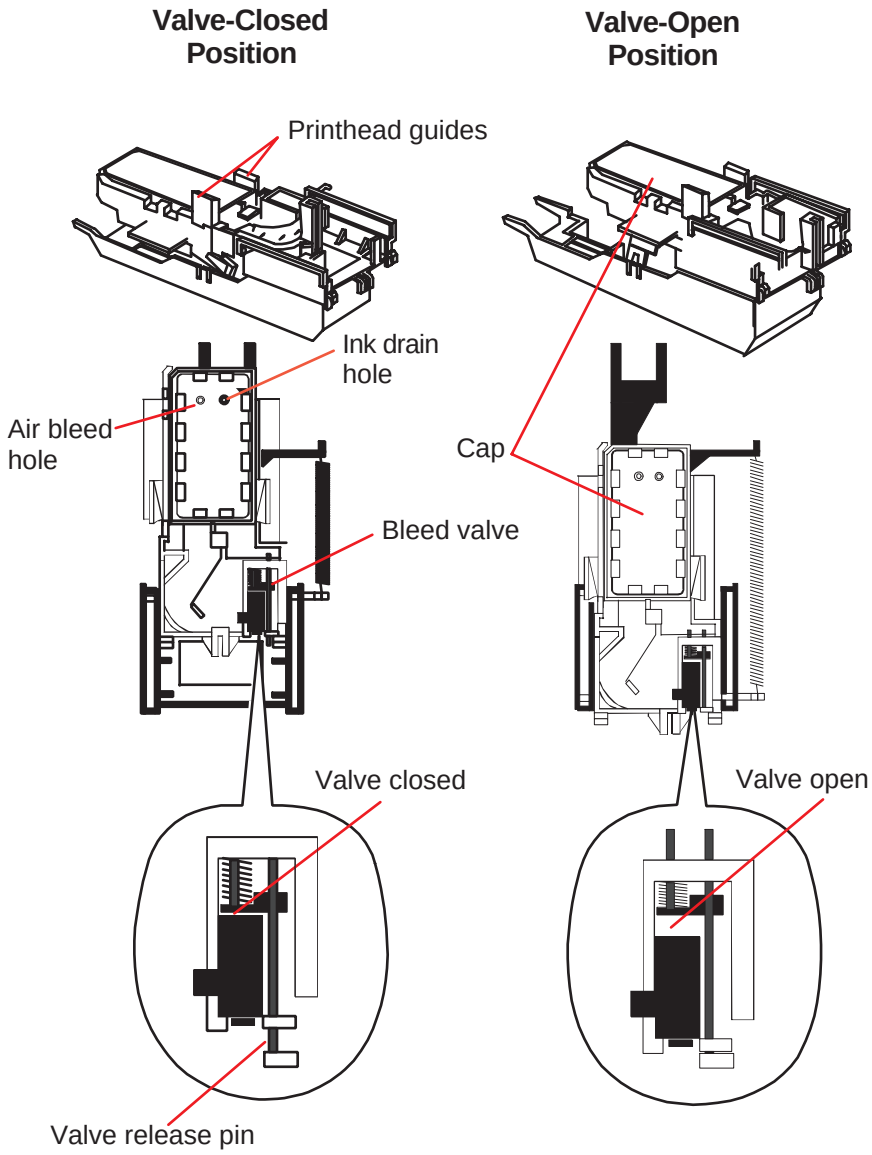


Figure 2-14. Capping Mechanism - Bleed Valve Operation

2.2 Electronic Circuit Boards

The Stylus COLOR 440, 640, and 740 contain three circuit boards each:

- Stylus COLOR 440:
  Main: C206 Main-B or C255 Main Board *
  Power Supply: C206 PSB, PSE Board
  Control Panel: C206 PNL Board
- Stylus COLOR 640:
  Main: C256 Main Board
  Power Supply: C206 PSB, PSE Board
  Control Panel: C206 PNL Board
- Stylus COLOR 740:
  Main: C257 Main Board
  Power Supply: C257 PSB, PSE Board
  Control Panel: C209 PNL Board

The printer's main electrical systems are connected as shown in Figure 2-15 at right.

* The C255 Main board will eventually replace the C206 Main-B board.

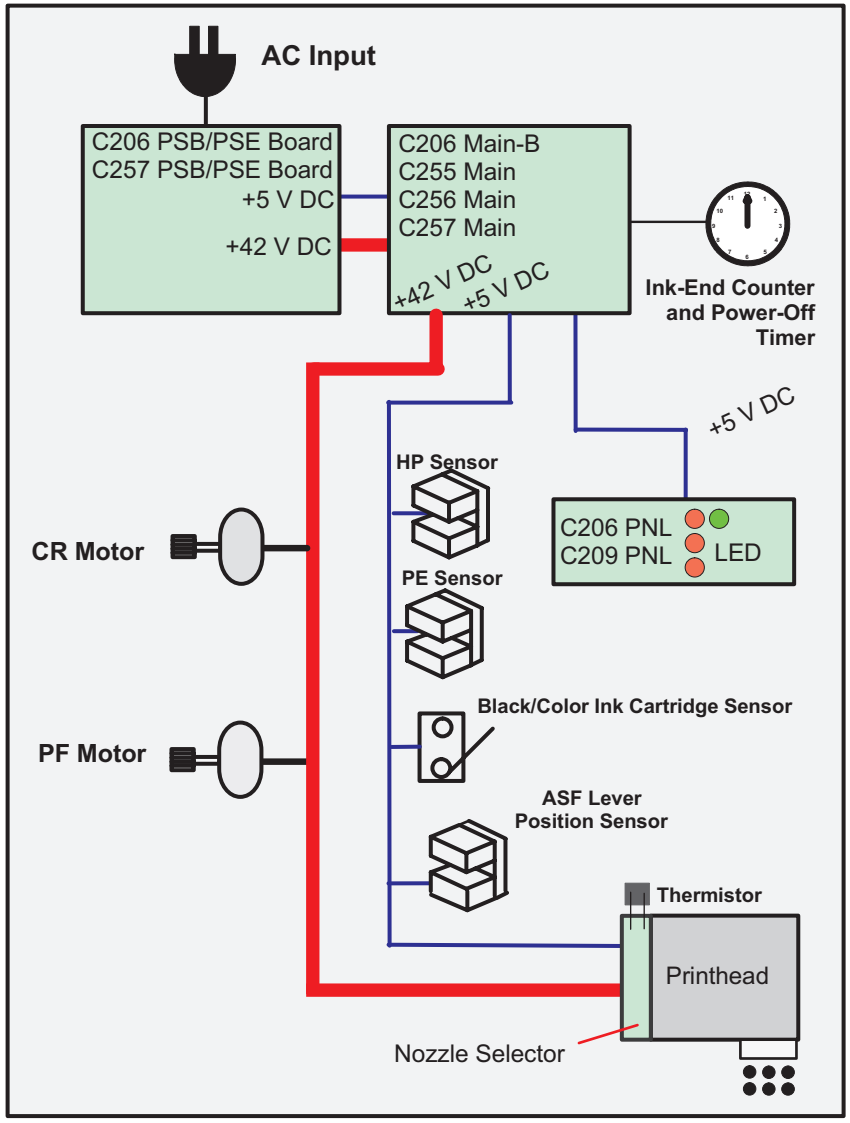


Figure 2-15. Connections Between Main Electrical Systems

2.2.1 Power Supply Board

The Stylus COLOR 440, 640, and 740 use one of two power supply boards: the PSB, which accepts 120 volts, or the PSE, which accepts 240 volts. The difference between them lies in their primary circuitry, which includes the power line filter, the main switching transistor, and the transformer. In the PSE, these components are designed to withstand higher input voltages than in the PSB. Except for these differences, the two boards are exactly the same.

The power supply provides filtered output at 5 and 42 VDC. These voltages power the various printer functions shown in the table below.

Table 2-8. Power Output Applications

Voltage	Application
42 VDC	CR motor PF motor Printhead PZTs
5 VDC	Logic circuitry Control signals Sensors Control panel LEDs Printhead nozzle selector IC

Built into the power supply is a delay circuit, which keeps the printer fully powered for about 30 seconds after the printer is turned off. (This works only when you turn the power off by pressing the Power switch on the front control panel; the printer will *not* stay on if you unplug it.) The delay gives the printer time to eject any paper that may be in the paper path and to return the carriage to its home position. (The carriage must return to its home position in order to cap the printhead. If the printhead remains uncapped, ink dries out and clogs the printhead.)

Power Supply Operation

When the printer is plugged in, electricity is always present in the primary circuitry of the power supply. This means that certain components are always "hot," including the power line filter circuit, the main switching transistor, and the transformer. Note that the heat sink on the main swtiching transistor (Q1) is *not* electrically isolated. Never touch the primary components of the power supply with the printer plugged in.

The secondary power supply circuitry, as well as the rest of the printer's electrical components, are electrically isolated from the primary power-line voltage. Isolation is accomplished by transformer T1 and photo-coupler PC1.

The power supply consists of a line filter, a ZC-RCC (Zero-Cross Ringing Choke Converter) switching circuit, and a 5-volt chopper regulator IC. See Figure 2-16. When AC power enters the printer from an external power source, the line filter blocks power-line transients from entering the printer and prevents radio frequency interference (high-level harmonics) generated by the switching circuit from being placed back onto the power line. In the PSB board, the primary current (at 120 VAC rms) then undergoes full-wave rectification and is smoothed to produce 160 VDC. (In the PSE board, the 220 VAC input is over 300 VDC after filtering.) This is fed through the RCC switching circuit and a secondary smoothing circuit to produce a stepped-down 42 VDC; feedback ensures stable output. A second, additional output at 5 VDC is produced by a chopper regulator IC which draws from the 42-volt supply.

At the heart of the switching circuit is a power MOSFET (Q1), an efficient type of transistor that dissipates relatively little heat. By using a transistorized switching circuit instead of a transformer to regulate

voltage, the power supply's cost is reduced. (Although a small transformer is still used, it's relatively inexpensive compared with the large, heavy transformer that would otherwise be needed.)

The RCC switching circuit works by alternately energizing and de-energizing the transformer. Oscillation begins when the voltage at the gate of Q1 rises through kick-start resistor R18. Current passing through Q1 enters transformer T1, energizing its primary coils. Since diode D51 prevents current from flowing through the transformer's secondary coils, the transformer is forced to store the energy as a magnetic field.

After startup, Q1 is held by voltage supplied by the transformer. This voltage is switched on and off by IC1, a programmable unijunction transistor (PUT). As the transformer becomes magnetically saturated, its output voltage drops below the PUT's holding threshold, and the PUT shuts off. This deprives Q1 of voltage, causing it to shut off and allowing the transformer to release its stored energy. As the magnetic field collapses, current begins flowing through the transformer's secondary coils. (Since the current's direction is reversed during discharge, diode D51 no longer blocks its flow.) When the transformer has fully de-energized, the cycle repeats. The resulting pulsed output contains less energy than the original input, since the unwanted energy has been chopped out, and can now be used for the final stepped-down voltage. To smooth the waveform, capacitor C51 filters the output, which is then regulated at 42 volts by a stack of seven 6-volt zener diodes.

As discussed above, the power supply contains a built-in delay that enables the printer to remain on long enough to complete its power-down operations. When you turn on the printer by pressing the power switch on the front control panel, the power control signal (PSC) from the main board energizes transistor Q84, which acts as a relay and turns on the power supply. At the same time, the PSC charges capacitor C84. As a result, even when you shut the printer off, the capacitor continues supplying power to Q84 and keeps the printer on for at least an additional 30 seconds.

To protect the printer, the power supply incorporates over-voltage, under-voltage, and short-circuit protection circuitry. These circuits contain zener diodes, which monitor the regulated output voltages. If the 5-volt supply exceeds 9 volts, or if the 42-volt supply exceeds 48 volts, the RCC switching circuit is immediately shut off and its output falls to zero. In addition, a voltage drop protection circuit protects the printer in case of a short circuit in any component that draws from the 42-volt line. This also works by shutting off the switching circuit, which occurs when output falls below 36 volts. Finally, fuse F1 protects the power supply itself, in case of a short circuit in any primary component.

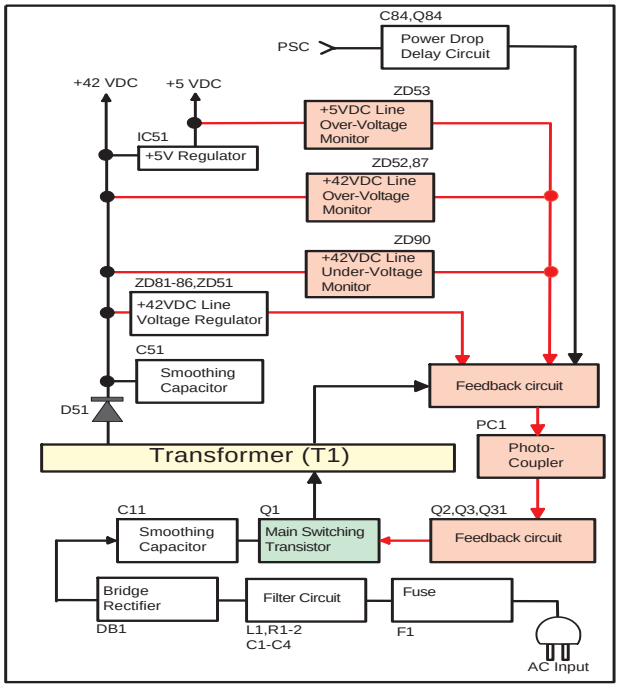


Figure 2-16. PSB, PSE Board Block Diagram

2.2.2 Main Circuit Board

The main board processes all incoming data and translates it into control signals used to operate the printer mechanism.

The Stylus COLOR 440 uses one of two main boards: the C206 MAIN-B or the C255 MAIN. (The C255 MAIN will eventually replace the C206 MAIN-B.) In addition, the Stylus COLOR 640 uses the C256 MAIN and the Stylus COLOR 740 uses the C257 MAIN.

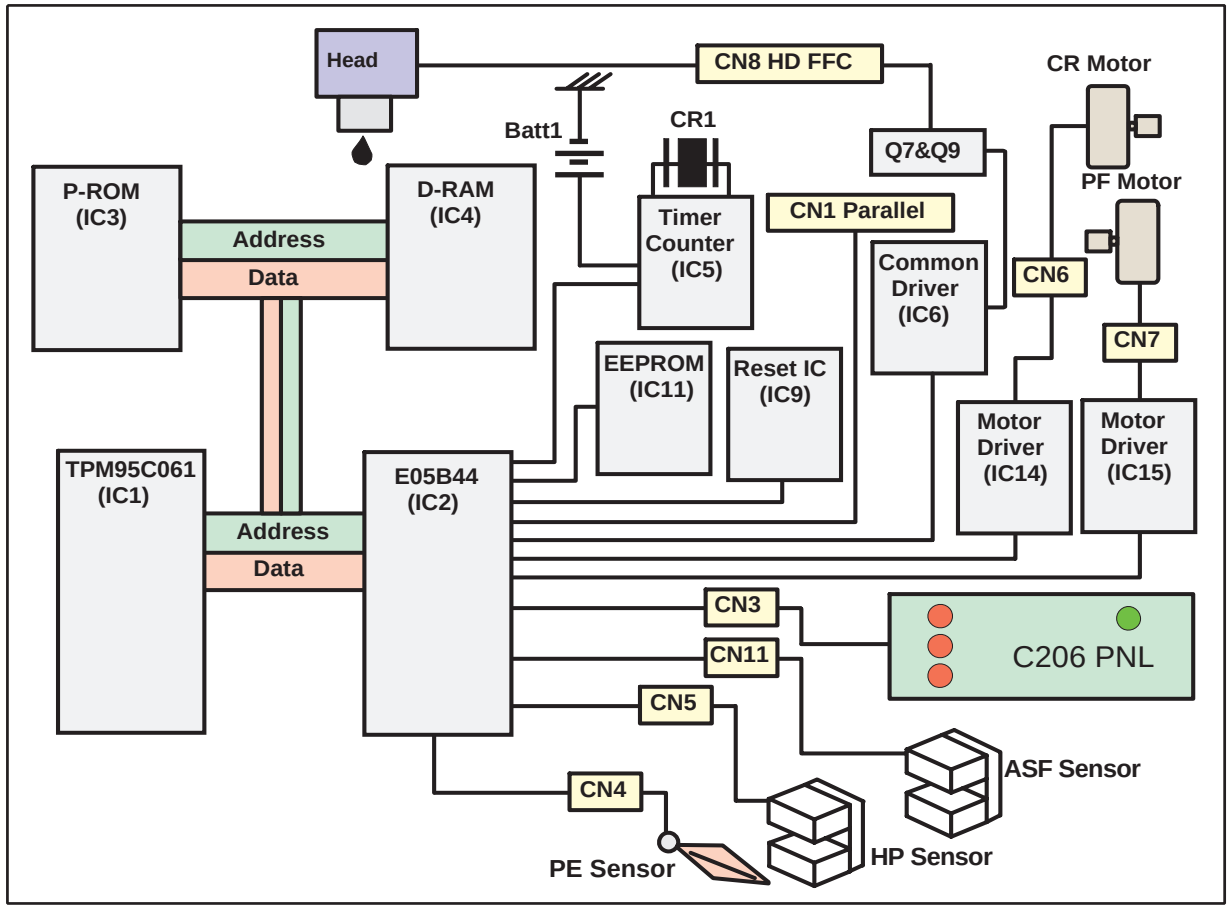


Figure 2-17. C206 MAIN-B, C255 MAIN Board Block Diagram for Stylus COLOR 440

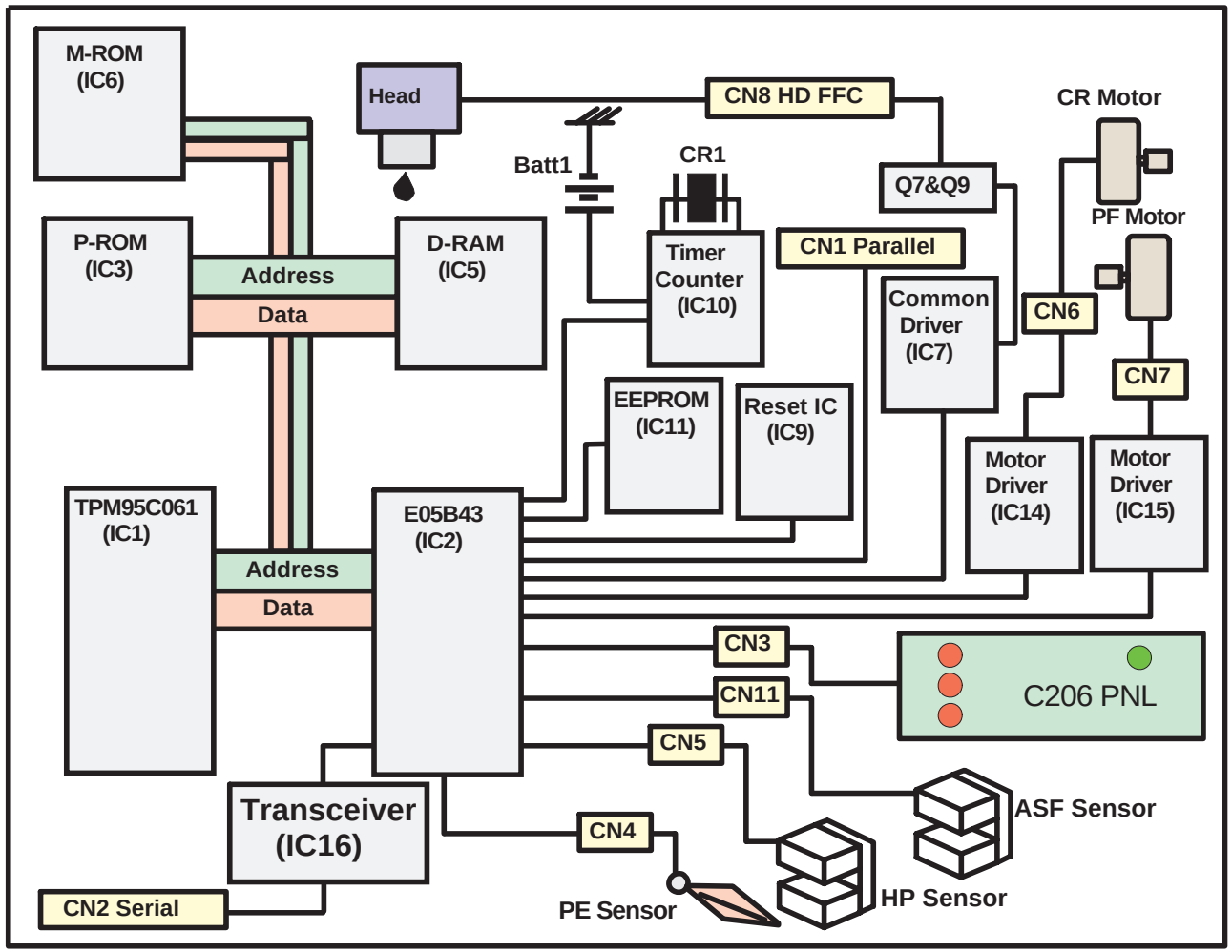


Figure 2-18. C256 MAIN Board Block Diagram for Stylus COLOR 640

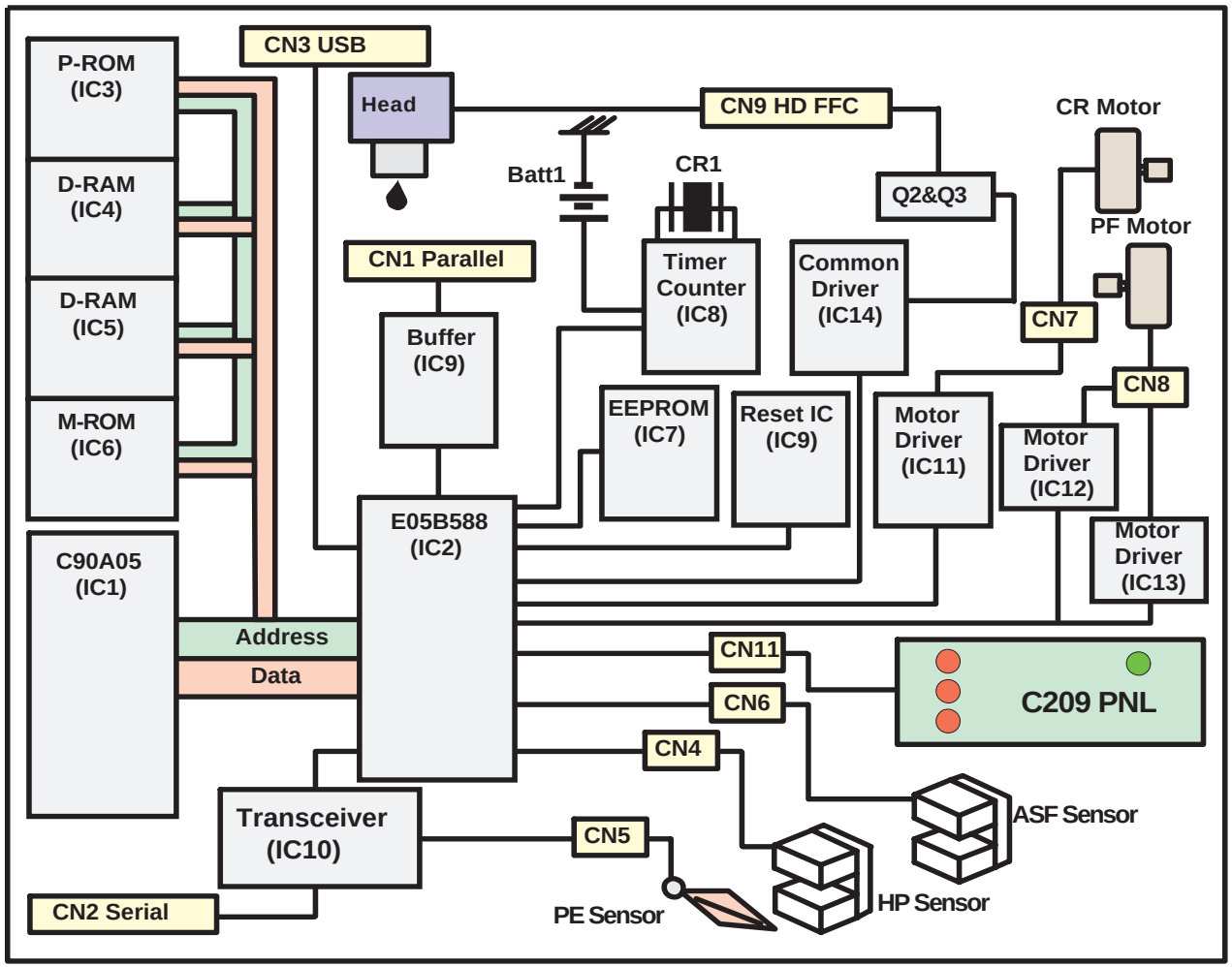


Figure 2-19. C257 MAIN Board Block Diagram for Stylus COLOR 740

CPU

The 16-bit CPU (IC1) runs at 25 MHz and performs the printer's data processing and memory management functions. This includes sending out the CAS and RAS refresh signals required by the DRAM.

Gate Array

The gate array (IC2) is the main hub for transmitting control signals and receiving data. It interfaces with the following devices:

- Paper Feed and Carriage Motor Drivers
  The gate array outputs motor control signals to the PF and CR motor drivers.
- Printhead Driver
  The gate array outputs control signals to the PH driver.
- EEPROM
  Default settings, records of previous printhead cleanings, ink cartridge usage, ink waste pad count, and adjustment values are stored in the EEPROM. The gate array retrieves these data when the printer is first turned on, and writes data to the EEPROM at power-off.
- Sensors
  The printer contains 6 sensors. Of these, 5 feed data directly to the gate array. (The thermistor connects to the CPU.)
- Power-Off Timer
  The gate array receives information from a timer that monitors how long the printer is turned off. When the printer is turned back on, the level of cleaning the printer performs on the printhead depends on how long the power has been off.
- Serial I/F Control (Stylus COLOR 740 only)
  The gate array receives serial port data through the transceiver IC.
- Parallel I/F control
  Using IEEE1284 Nibble mode, the gate array not only receives data from the host computer but can also return information about the printer's status.
- USB I/F Control (Stylus COLOR 740 only)
  The transceiver circuit that controls the USB interface has been incorporated into the gate array.

EEPROM

The EEPROM of Stylus COLOR 440, 640, and 740 contains the following:

- Ink cartridge consumption data (Blk, CMY)
- Ink waste pad counter
- Printhead cleaning information (keeps track of previous cleaning operations)
- Destination information
- Adjustment values (Bi-D, printhead voltage ID, etc.)
- Default values set by the user

As shown in the figures below, the EEPROM connects to the gate array (IC2) by 4 lines which perform the following functions:

- CS: Chip select signal
- CK: Clock pulse
- DI: Data in (writing of serial data at power off)
- DO: Data out (reading of serial data at power on)

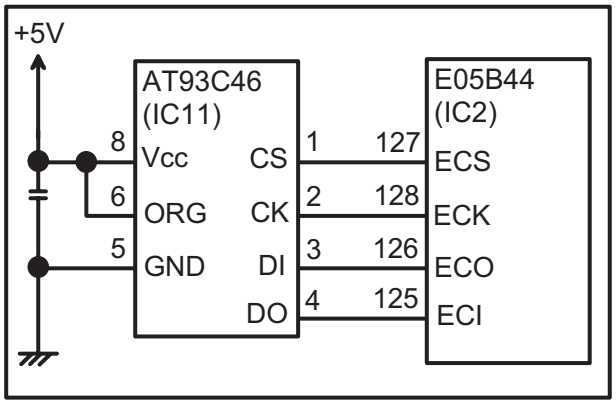


Figure 2-20. EEPROM Control Circuit for Stylus COLOR 440

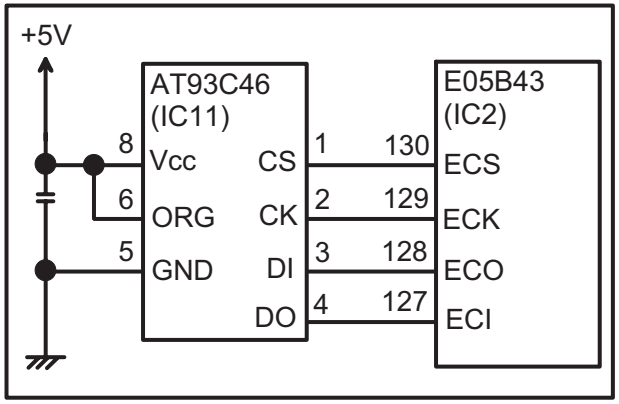


Figure 2-21. EEPROM Control Circuit Stylus COLOR 640

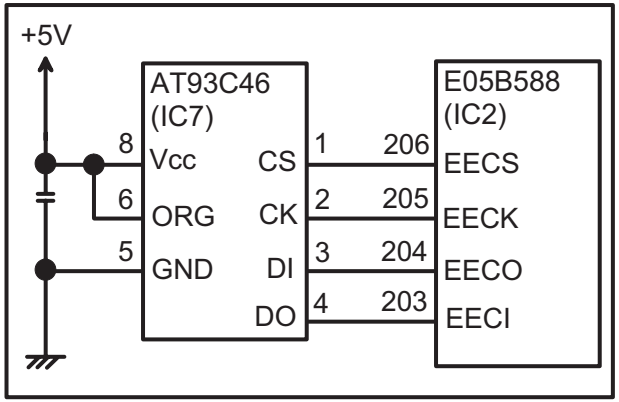


Figure 2-22. EEPROM Control Circuit for Stylus COLOR 740

Reset Circuit

The reset circuit (IC 9 on the Stylus COLOR 440 and 640, IC8 on the 740) holds the reset pins of the CPU and the gate array LOW at power-on. This resets the chips' internal state and prevents them from outputting erratic signals or data. To give the power supply time to build up a stable output voltage, a brief delay is built into the system. This delay is programmed by an external RC network. When the reset signal is removed after the delay, the CPU and the gate array begin normal functioning.

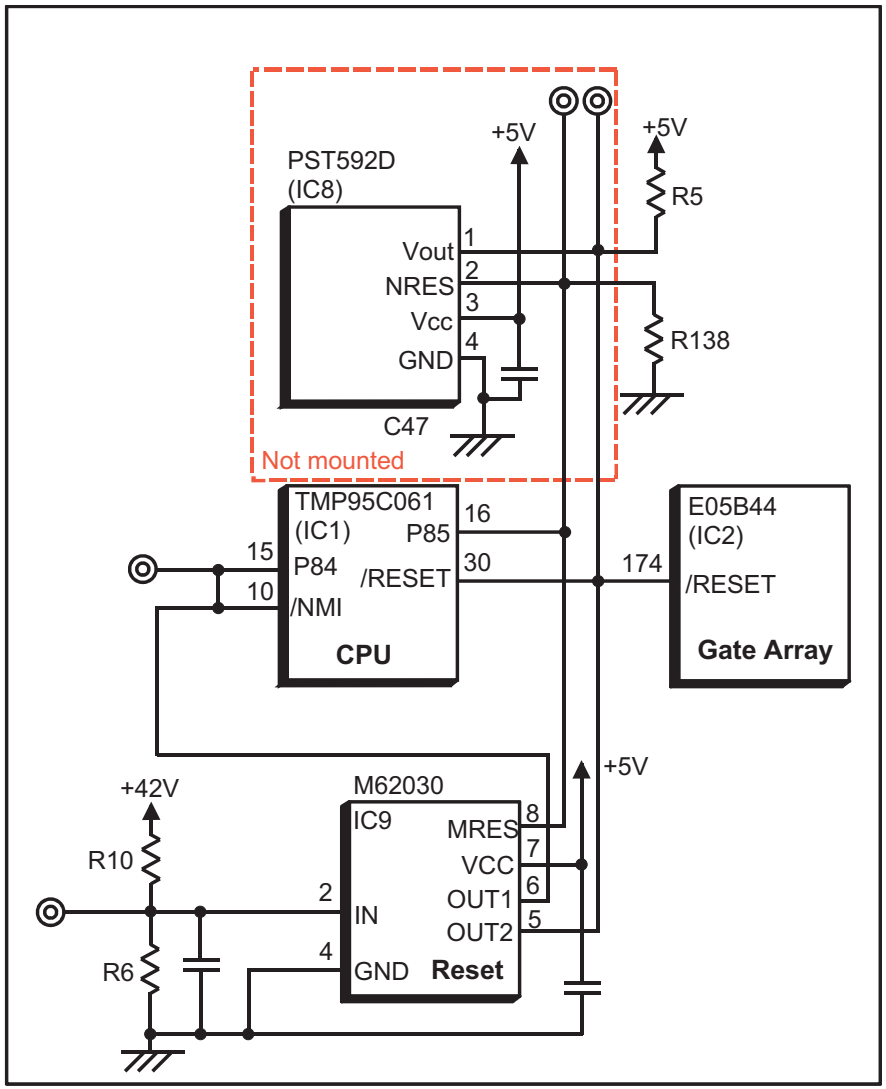


Figure 2-23. Reset Circuit for Stylus COLOR 440

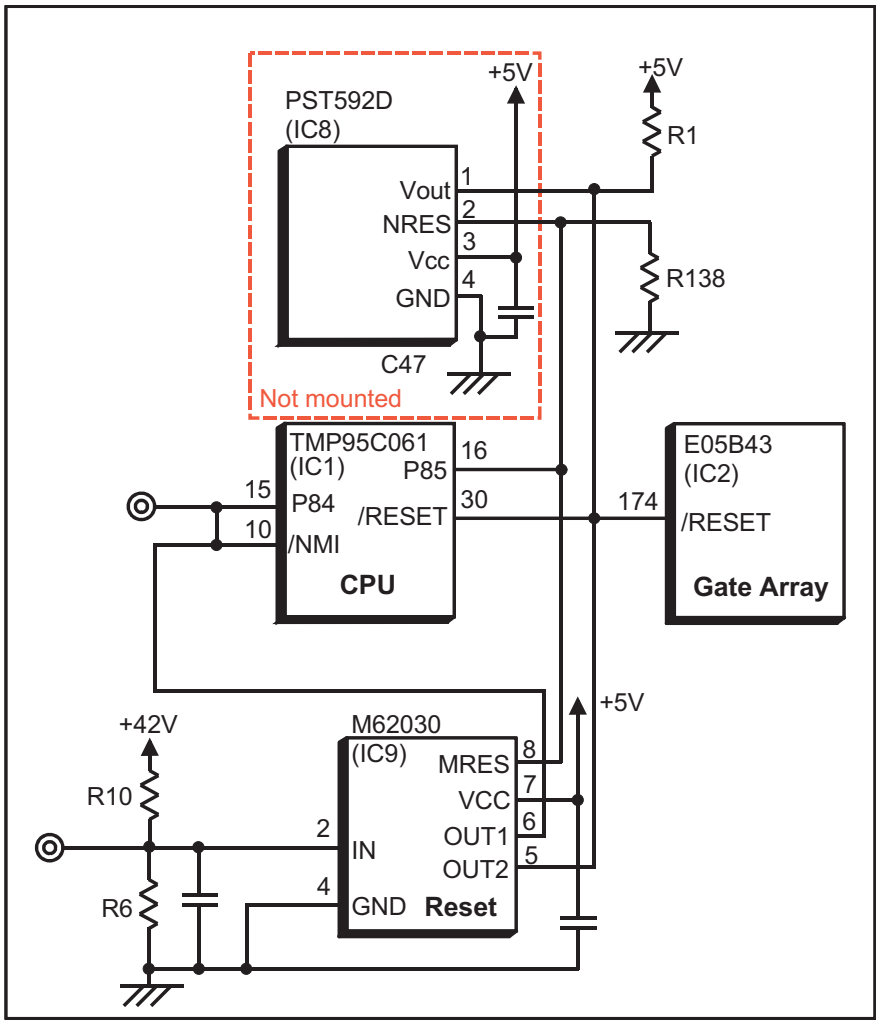


Figure 2-24. Reset Circuit for Stylus COLOR 640

The reset IC on the main board of the Stylus COLOR 740 has a dual role. As shown in the figure below, it combines the reset circuitry with the power-off timer that monitors how long the printer is off.

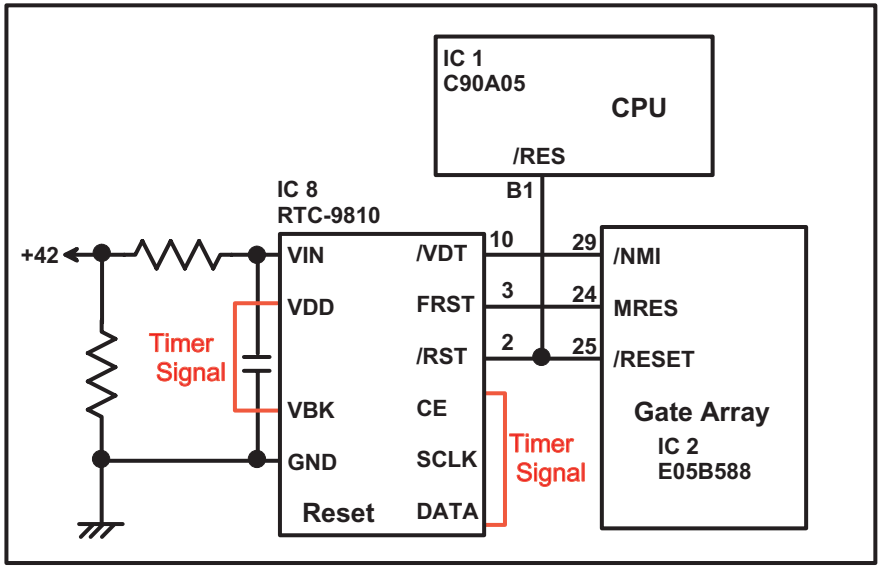


Figure 2-25. Reset Circuit for Stylus COLOR 740

Power-Off Timer Circuit

The timer IC measures how long the printer is turned off. When the printer is turned on, the IC sends the power-off time to the gate array. The power-off time determines how extensively the printhead is cleaned at power-on.

In the Stylus COLOR 440 and 640, an external crystal oscillator (CR1 or CR3) provides the basic timing pulse. In the Stylus COLOR 740, the oscillator is built into IC8, the same chip that contains the reset circuit. Since the crystal's oscillation produces an analog waveform, the timer IC converts it into a square wave to enable it to be processed digitally.

When the printer is on, power is supplied to the timer through the 5-volt power bus. When the printer is turned off, a 3-volt lithium battery powers the chip. Diodes on the power supply line prevent the battery from charging when the printer is on, and from discharging back into the power line when the printer is off.

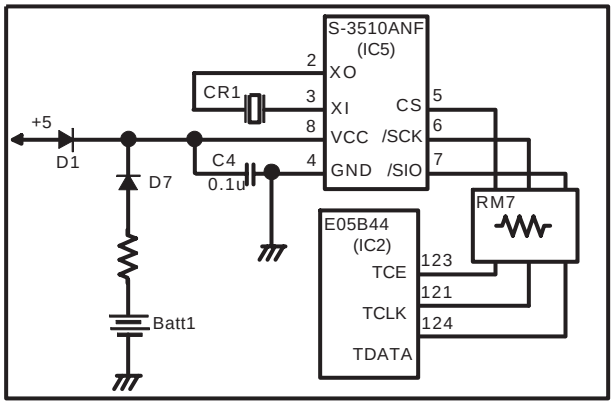


Figure 2-26. Timer Control Circuit for Stylus COLOR 440

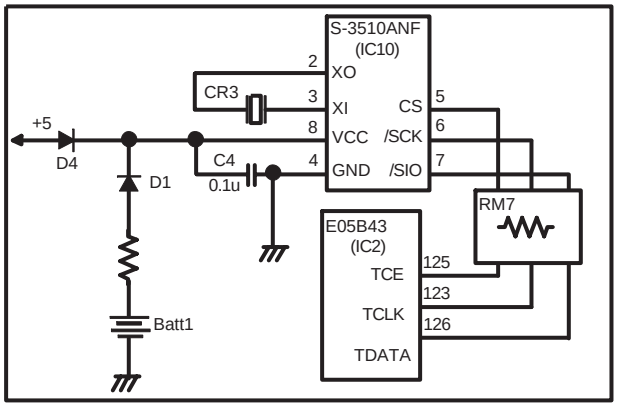


Figure 2-27. Timer Counter Circuit for Stylus COLOR 640

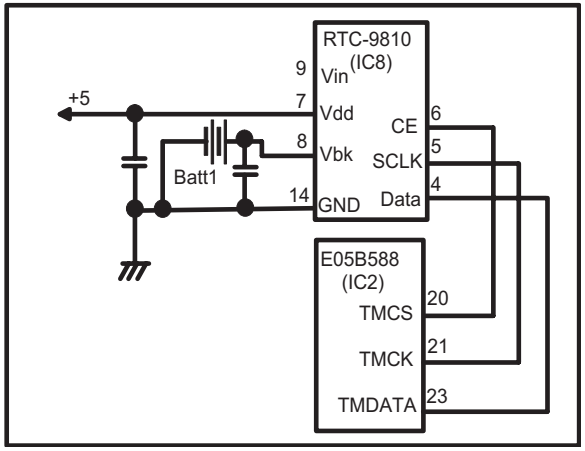


Figure 2-28. Timer Counter Circuit for Stylus COLOR 740

Sensor Circuits

The printer mechanism includes 3 sensors. As shown in the following figures, they connect directly to the gate array (IC2).

- ASF Sensor
  The ASF sensor detects the home position of the auto sheet feeder.
- PE Sensor
  The PE sensor determines if there is paper in the printer. In addition, if paper of non-standard length is inserted into the printer, the PE sensor detects its edge and prevents printing from taking place on the bare platen.
- HP Sensor
  The HP sensor detects the home position of the carriage.

The following sensors are part of the printhead and carriage unit.

- Thermistor
  The thermistor detects printhead temperature and maintains print quality despite changes in environmental conditions. When the thermistor heats up, its resistance changes and a corresponding voltage relays this information to the CPU. The gate array makes slight adjustments to the PZT drive voltage based on this information, and print quality is maintained.
- Cartridge Sensors (Black, Color)
  Sensors built into the carriage unit detect the presence of the ink cartridges during cartridge replacement and when the power is turned on. This information is received by the gate array. In the Stylus COLOR 440, 640, and 740 printers, every time the black or color ink cartridge is removed, its respective ink consumption counter gets reset.

NOTE: *Ink consumption is not detected by a sensor. Rather, it is calculated from the same EPW data that the printer sends to the host.*

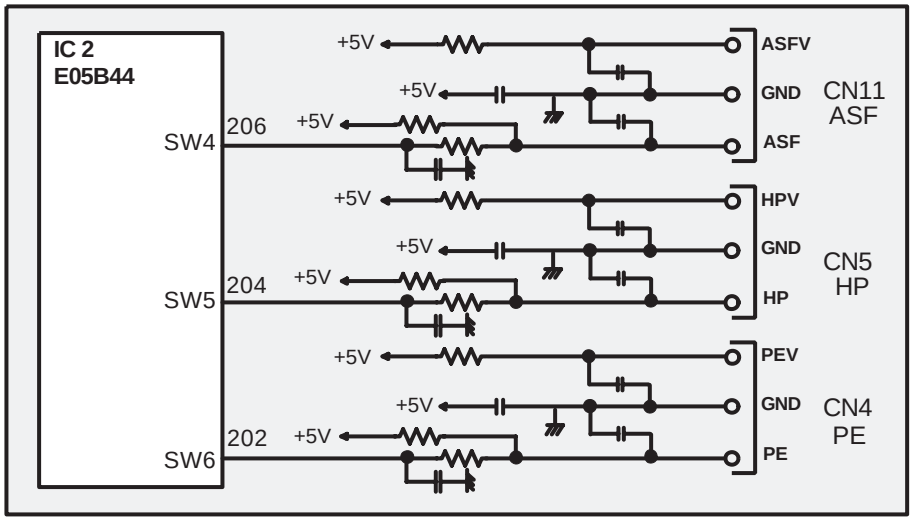


Figure 2-29. Figure 5-23. Sensor Circuit for Stylus COLOR 440

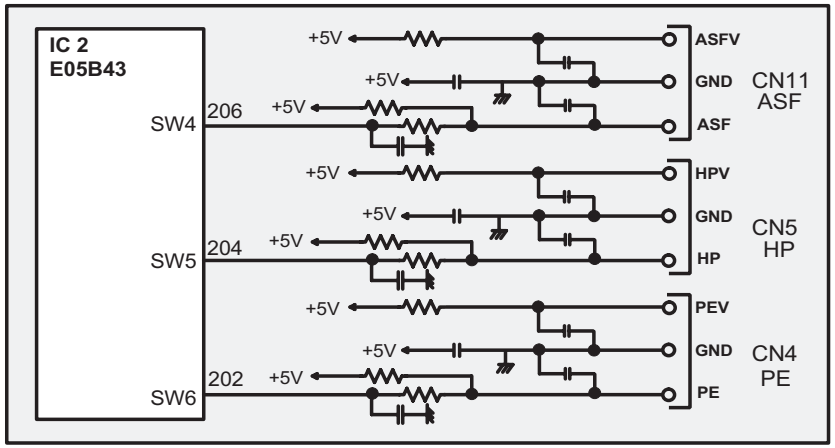


Figure 2-30. Figure 5-24. Sensor Circuit for Stylus COLOR 640

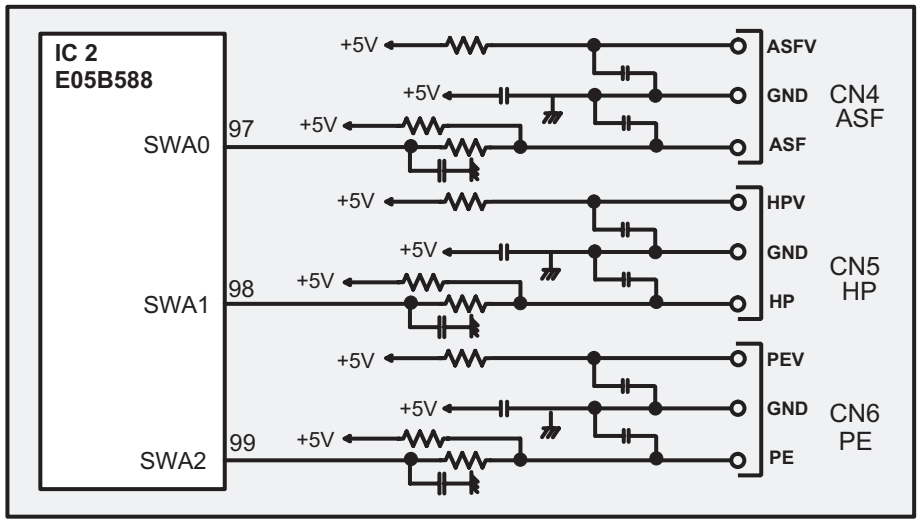


Figure 2-31. Sensor Circuit for Stylus COLOR 740

Printhead Driver

The printhead control circuit has the following features:

- High-speed drive: the common voltage drive circuit runs at 14.4 KHz.
- Slight vibration mode: this is added during carriage acceleration to eliminate trapped air bubbles.
- Normal Dot and Dual Firing (also called Normal-Dot-2Dot): these modes can be selected by the user from the driver software.

The printhead control circuit is divided into two parts: the common voltage drive, which supplies power to the printhead as a whole, and the nozzle selector drive, which determines the individual PZTs to which the power is applied.

Common Voltage Drive Circuit

The common voltage drive circuit generates the voltage waveform for driving the PZTs (piezo-electric elements) in the printhead. The gate array outputs signals to the common drive IC (H8D2813, H8D2889, or CXA20995 in the Stylus COLOR 440, 640, or 740). The common drive IC then drives 2 power transistors arranged in a push-pull configuration (see Figures 2-32 through 2-34 below). The waveform produced by these transistors is called the "trapezoidal" waveform, because it looks like an irregularly shaped trapezoid with a small step in the middle. The trapezoidal waveform can be observed any time the printer is on, whether something is being printed or not.

Table 2-9. Common Voltage Driver Characteristics

Items	Characteristics
Drive voltage	42 volts ± 5% Waveform appears after voltage rises above 5 volts.
Final drive element (power transistors)	2S**C3746** (PNP) 2S**A1469** (NPN)
Operation during reset	Both transistors are off.

Nozzle Selector Drive Circuit

The nozzle selector IC is located in the printhead itself. Data from the gate array is sent serially to the IC and latched in one-byte units. After the IC interprets the data, it sends print signals in parallel to the appropriate PZTs. These signals are synchronized with the trapezoidal waveform produced by the common voltage driver, and determine which PZTs get actuated by the common voltage in each cycle.

Figure 2-32, Figure 2-33, and Figure 2-34 show printhead driver diagrams for each printer.

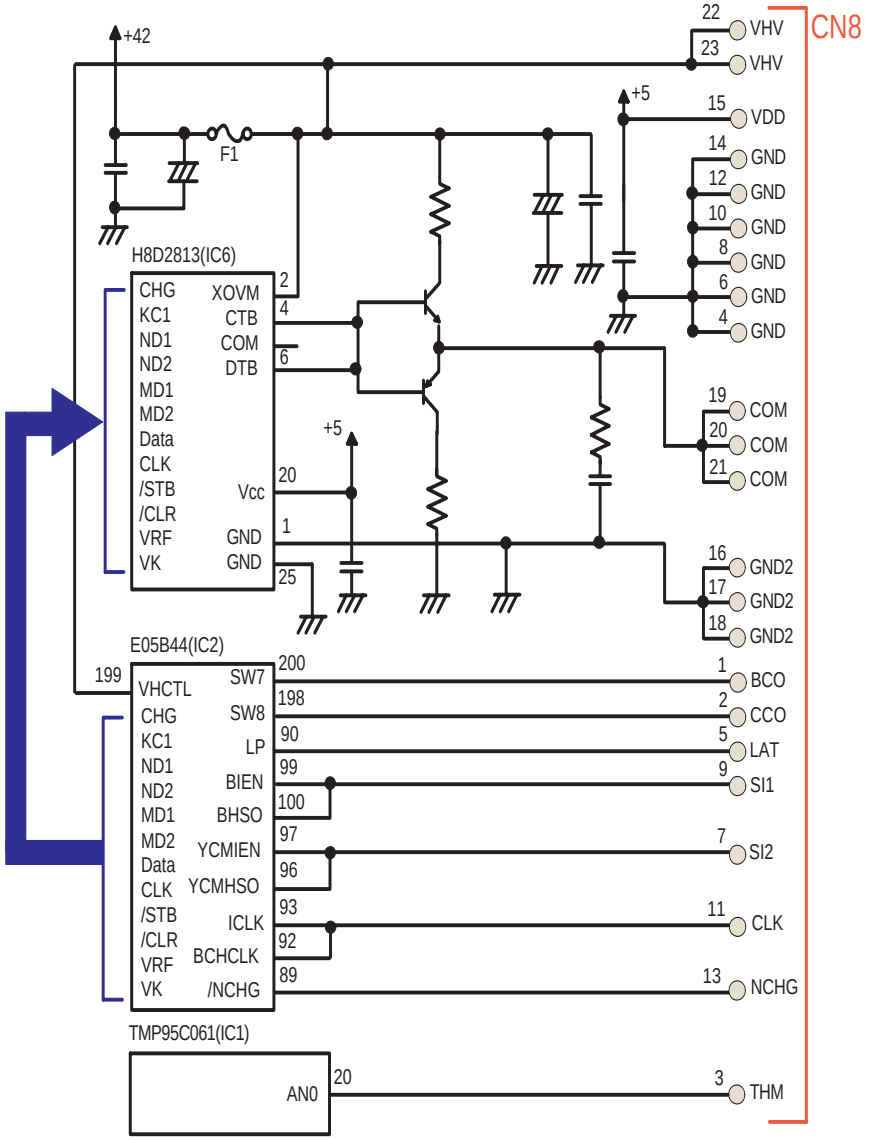


Figure 2-32. Head Drive Circuit for Stylus COLOR 440

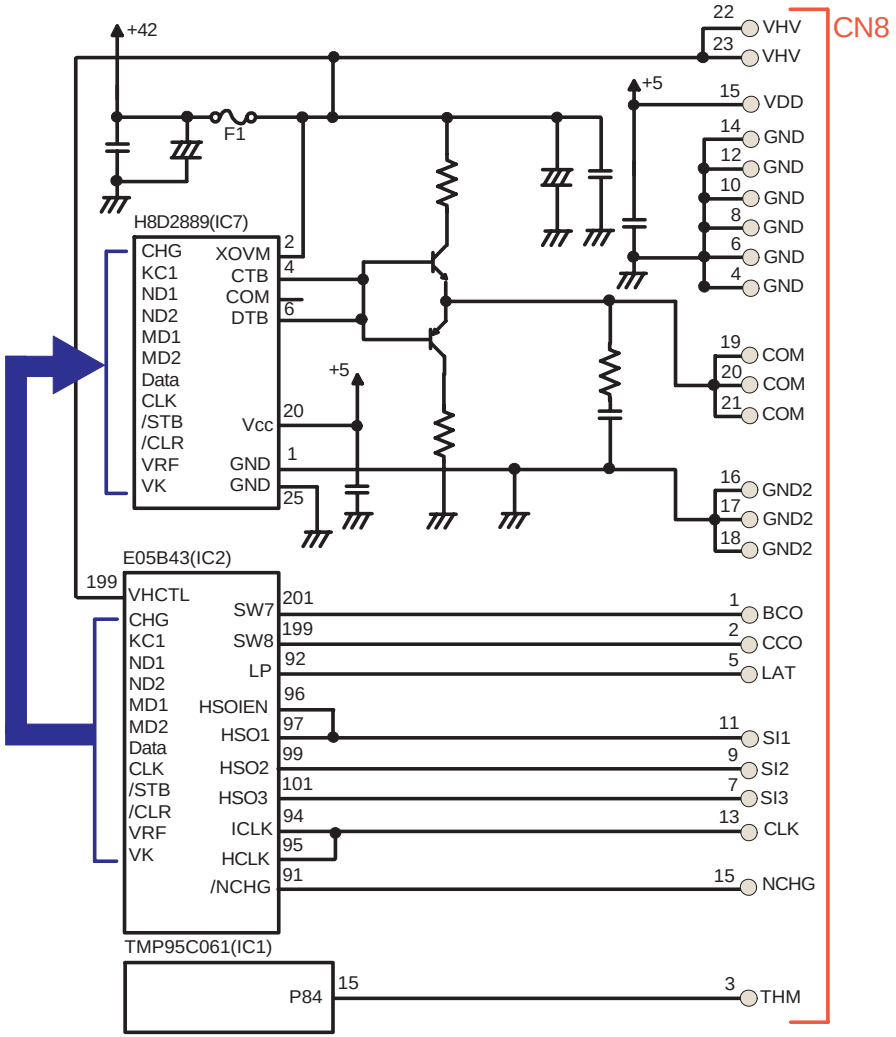


Figure 2-33. Head Driver Circuit for Stylus COLOR 640

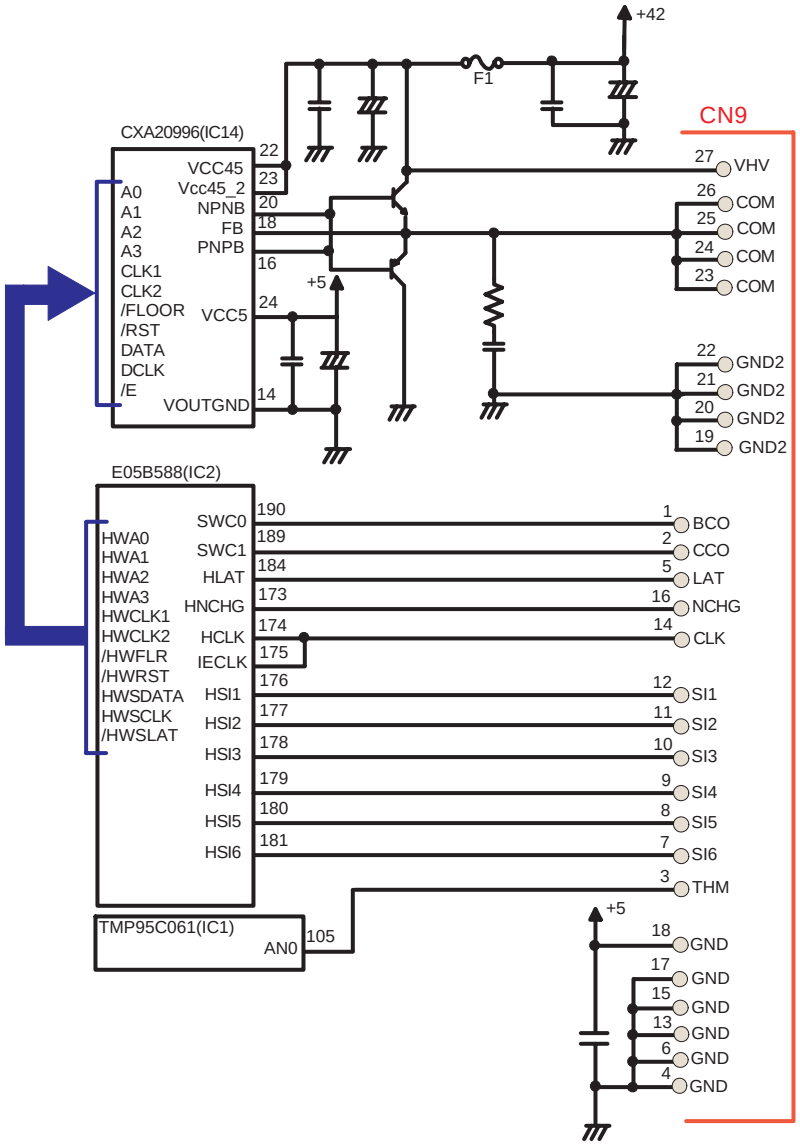


Figure 2-34. Head Drive Circuit for Stylus COLOR 740

Paper Feed (PF) Motor Driver

The paper feed motor is a bipolar stepper motor controlled by a pulse-width modulation (PWM) circuit. The drive circuit provides contant current output for maximum motor stability and control. See the following figures for circuit details.

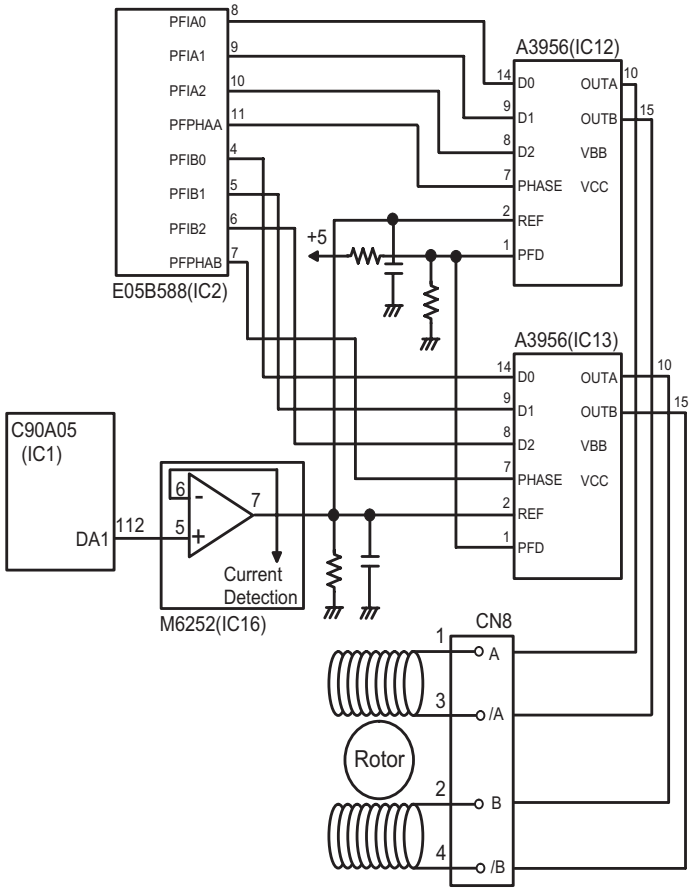


Figure 2-35. PF Motor Driver for Stylus COLOR 740

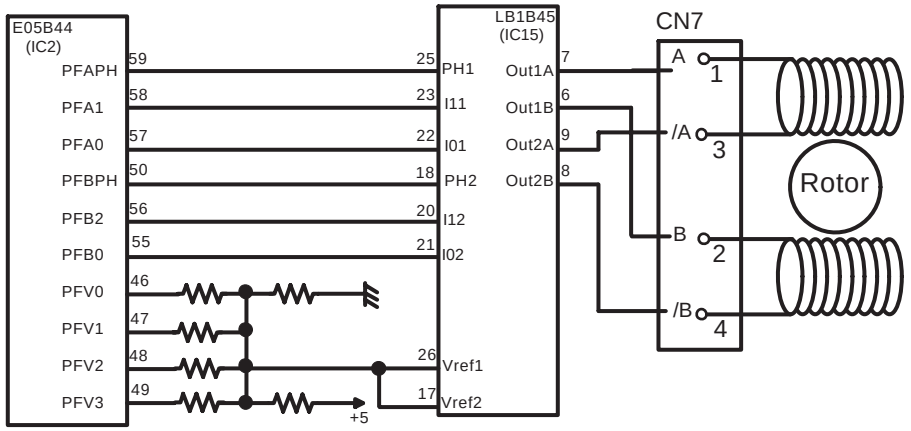


Figure 2-36. PF Motor Driver for Stylus COLOR 440

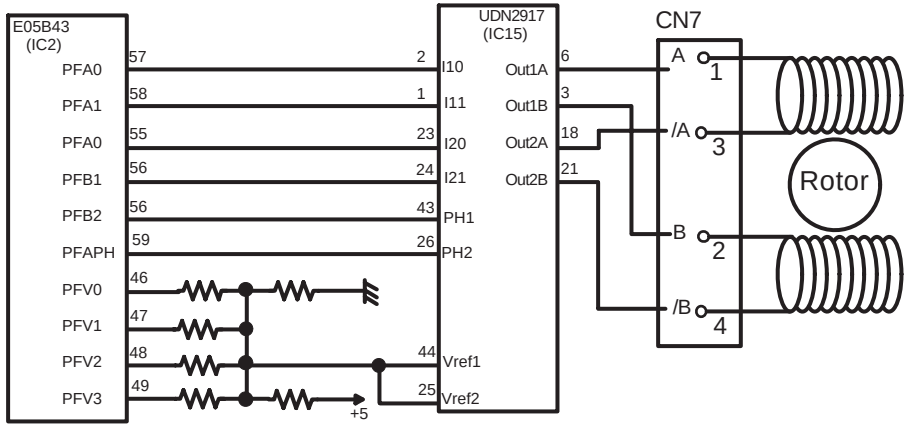


Figure 2-37. PF Motor Driver for Stylus COLOR 640

Carriage (CR) Motor Drive Circuit

The carriage motor is a bipolar stepper motor controlled by a pulse-width modulation (PWM) circuit. The drive circuit provides constant current output for maximum motor stability and control. See the following figures for circuit details.

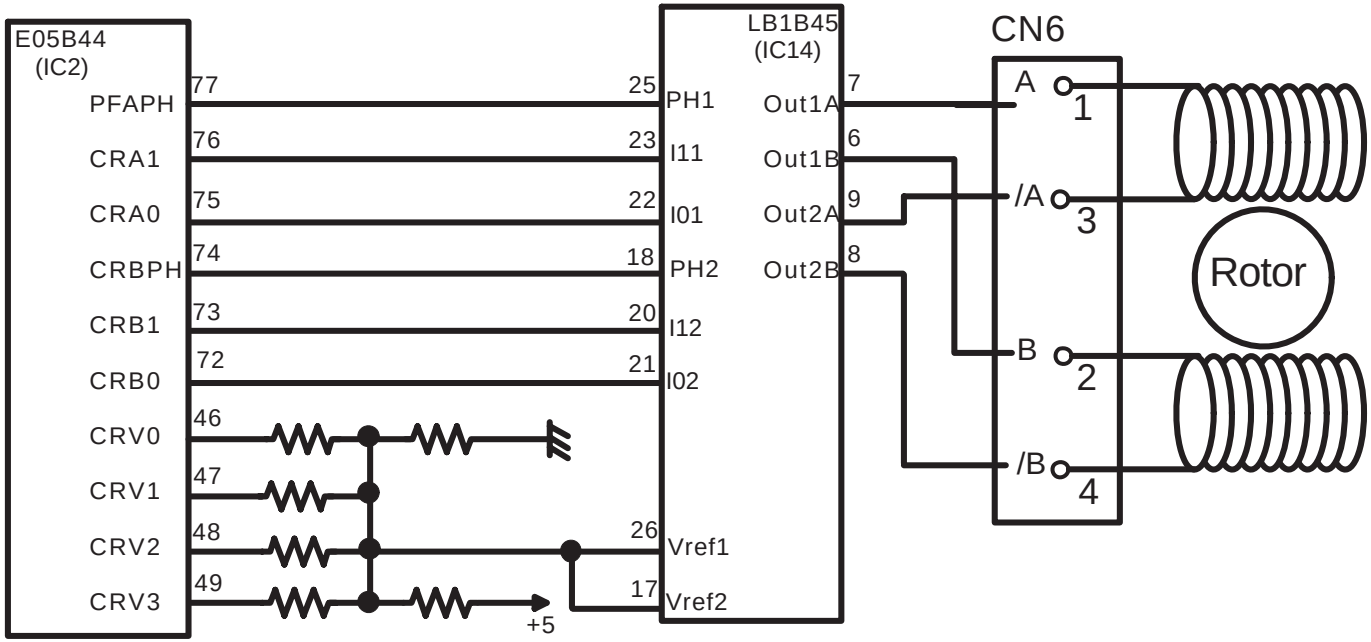


Figure 2-38. Carriage Motor Drive Circuit for Stylus COLOR 440

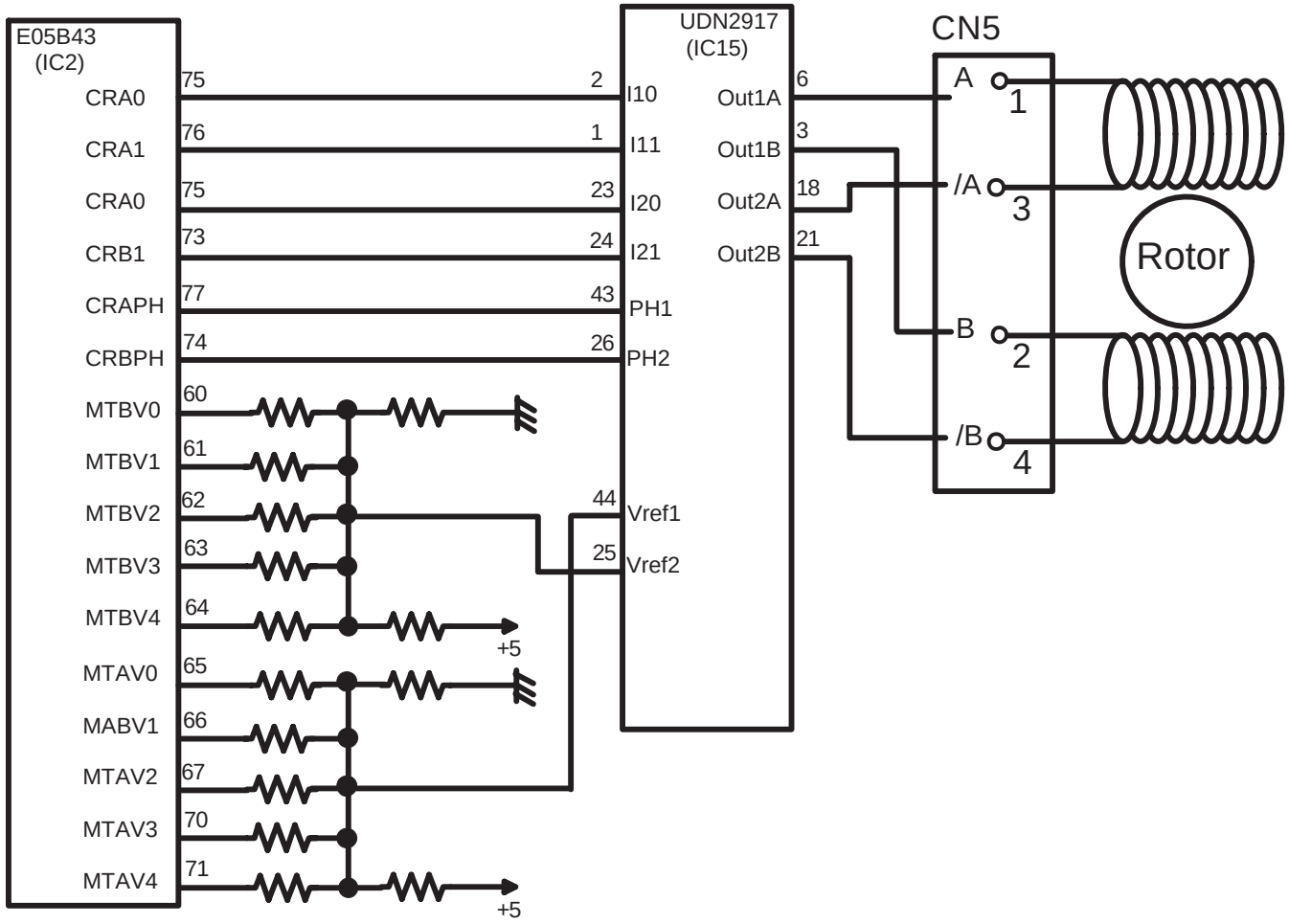


Figure 2-39. Carriage Motor Drive Circuit for Stylus COLOR 640

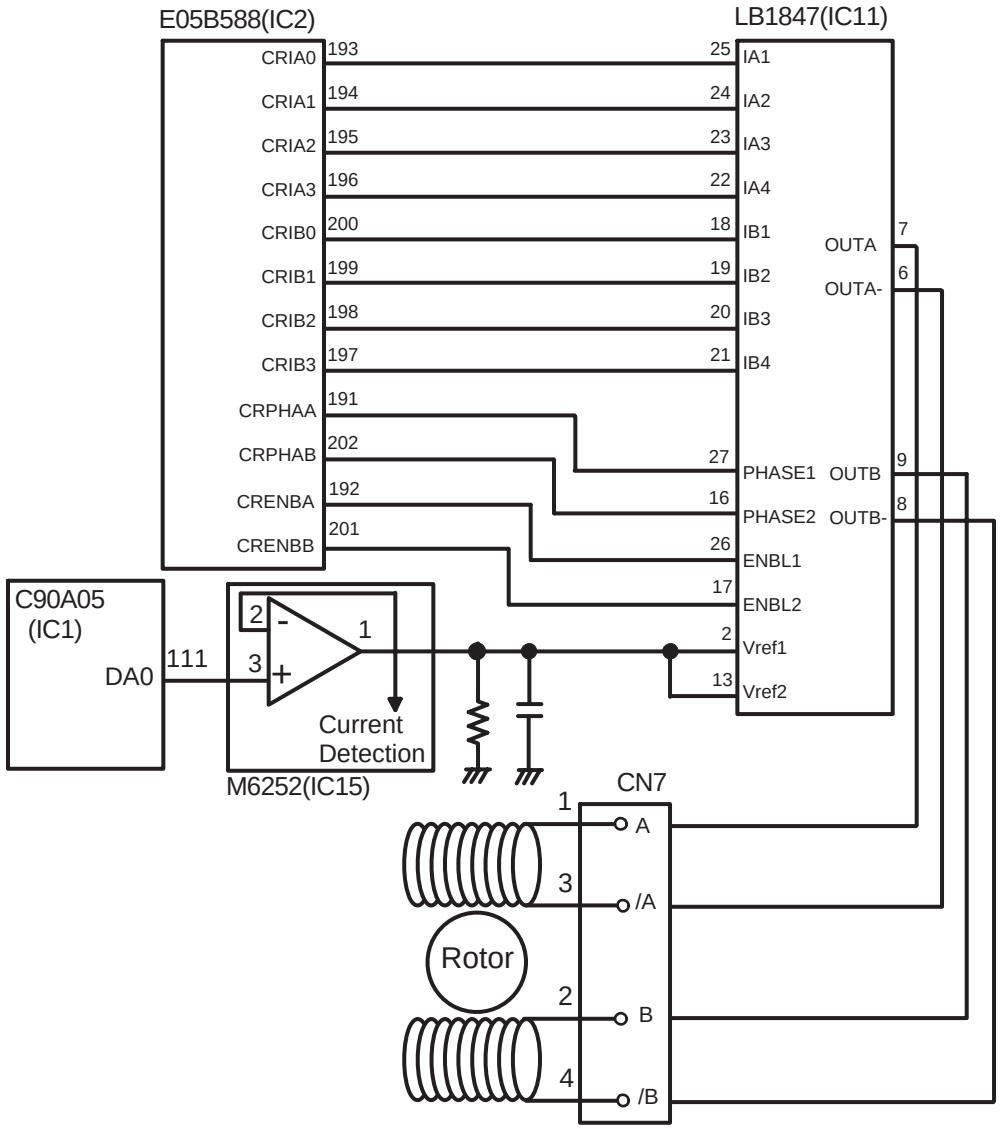


Figure 2-40. Carriage Motor Drive Circuit for Stylus COLOR 740

CHAPTER

3

TROUBLESHOOTING

3.1 Troubleshooting

The printer may exhibit different symptoms for the same problem. Start with Table 3-4 to locate the appropriate flowchart, and then use the flowchart to identify a problem based on its symptoms. Refer to the tables at the end of this chapter for detailed information on testing and repairing printer components.

The following figure illustrates the main steps of the troubleshooting process.

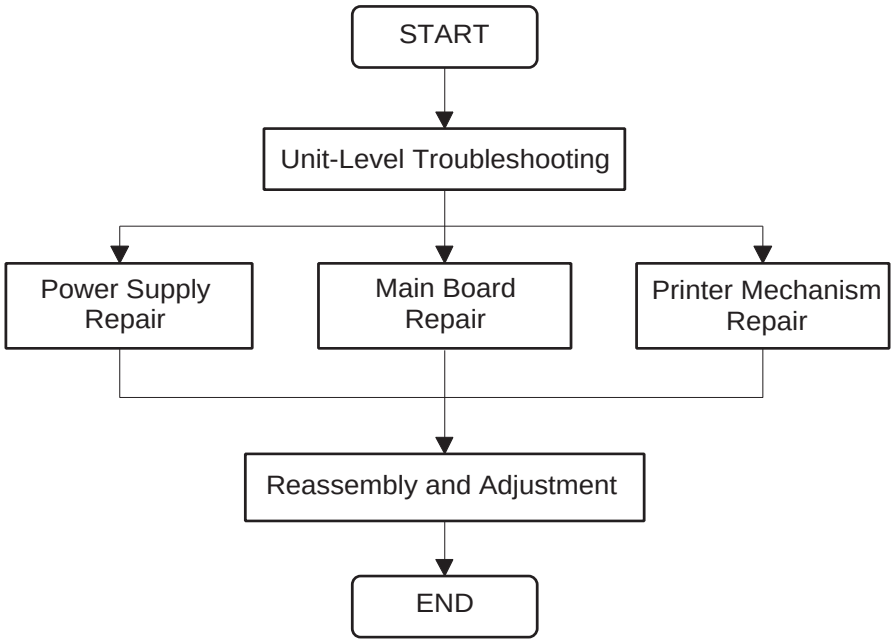


Figure 3-1. Troubleshooting Process Flowchart

3.1.1 Component Test Specifications

The following tables specify the values at which the CR motor, PF motor, and sensors should test. In addition, Table 3-3 shows how to interpret the printer's LED error indicators.

Table 3-1. Motor Coil Resistance

CR motor	• Stylus Color 440/ 640 CN6 (Main board *) • Stylus Color 740 CN7 (Main board *)	Pins 1 & 3, Pins 2 & 4	7.8 Ohms ± 10%
PF (pump) motor	• Stylus Color 440/ 640 CN7 (Main board *) • Stylus Color 740 CN8 (Main board *)	Pins 1 & 3, Pins 2 & 4	7.8 Ohms ± 10%

** Main board refers to the following:*
Stylus Color 440: C206 Main-B or C255 Main
Stylus Color 640: C256 Main
Stylus Color 740: C257 Main

Table 3-2. Sensor Check

Sensor Name	Location	Signal Level	Sensor Status
Paper end sensor	• Stylus Color 440/640 CN4/Pins 1 & 2 • Stylus Color 740 CN5/Pins 1 & 2	Open: less than 0.7 V	Paper loaded
		Closed: more than 2.4 V	No paper
Carriage home position sensor	• Stylus Color 440/640 CN5/Pins 1 & 2 • Stylus Color 740 CN4/ Pins 1 & 2	Open: less than 0.7 V	Home position
		Closed: more than 2.4 V	Away from home position
ASF home position sensor	• Stylus Color 440/640 CN11/Pins 1 & 2 • Stylus Color 740 CN6/ Pins 1 & 2	Open: less than 0.7 V	Home position
		Closed: more than 2.4 V	Away from home position
Black cartridge sensor (BCO)	• Stylus Color 440/640 CN8/ Pins 1 & 18 • Stylus Color 740 CN9/Pins 1 & 19	On: 0V	Black cartridge out
		Off: more than 2.4 V	Black cartridge installed
Color cartridge sensor (CCO)	• Stylus Color 440/640 CN8/ Pins 2 & 18 • Stylus Color 740 CN9/Pins 2 & 19	On: 0V	Color cartridge out
		Off: more than 2.4 V	Color cartridge installed
Thermistor	Pins 3 & 4 or Pins 3 & 6	Approx. 10 KΩ at 77° F (25° C)	Resistance increases with temperature.

Table 3-3. LED Indicators and Printer Status

Error Status	Indicators				Recovery
	Power	Ink out (Black)	Ink Out (Color)	Paper Out	
Paper out	Blinking	—	—	On	Load additional paper and press the load/eject button.
Paper jam	—	—	—	Blinking	Remove the paper, then press the load/eject button.
No ink cartridge or ink end (black)	—	On	—	—	Insert a new black ink cartridge and press the load/eject button for 3 seconds.
No ink cartridge or ink end (color)	—	—	On	—	Insert a new black ink cartridge and press the load/eject button for 3 seconds.
Maintenance request	Blinking	Blinking	Blinking	Blinking	Change the waste ink drain pad and reset the EEPROM.
Fatal error	Blinking	On	On	Blinking	Turn the printer off and then on again. If the printer does not recover, repair the malfunctioning part.

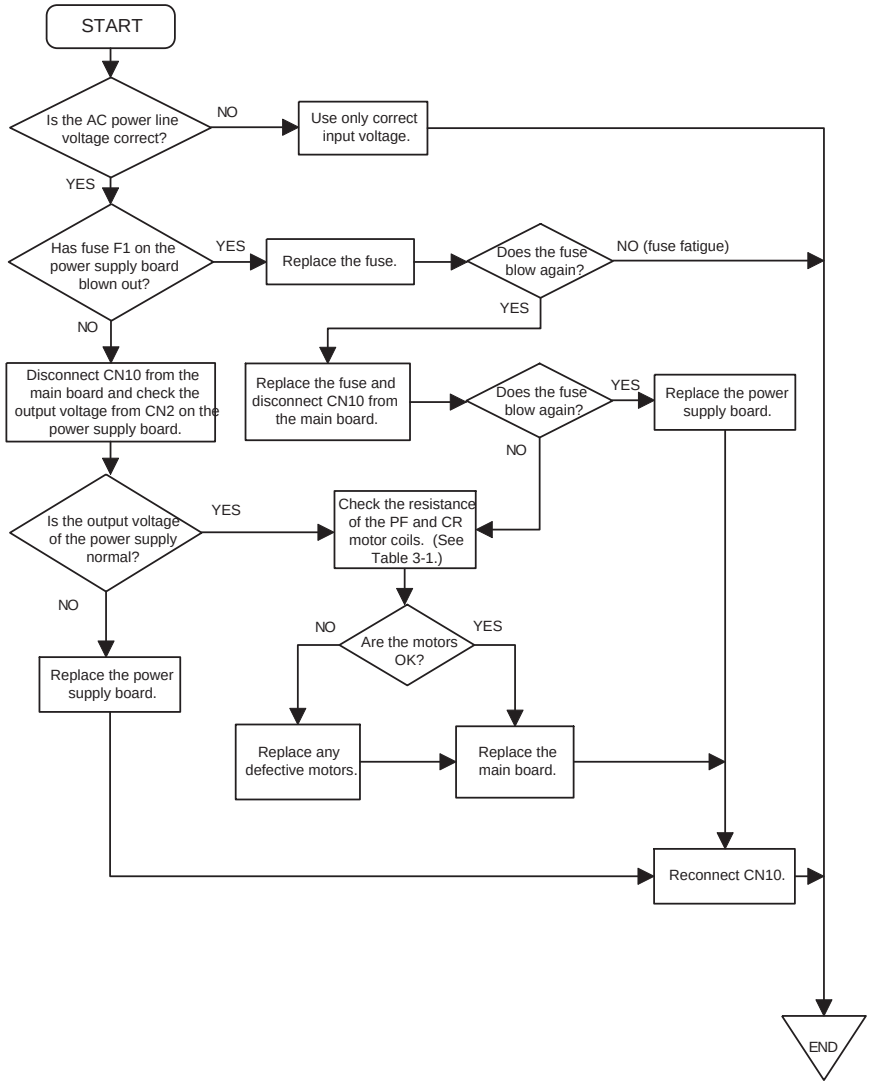
3.2 Unit Level Troubleshooting

When a problem occurs, you can identify its cause by the symptoms the printer exhibits. The table below lists the symptoms of certain problems. Once the problem is identified, refer to the flowchart that corresponds to the problem.

Table 3-4. Flowchart Selection

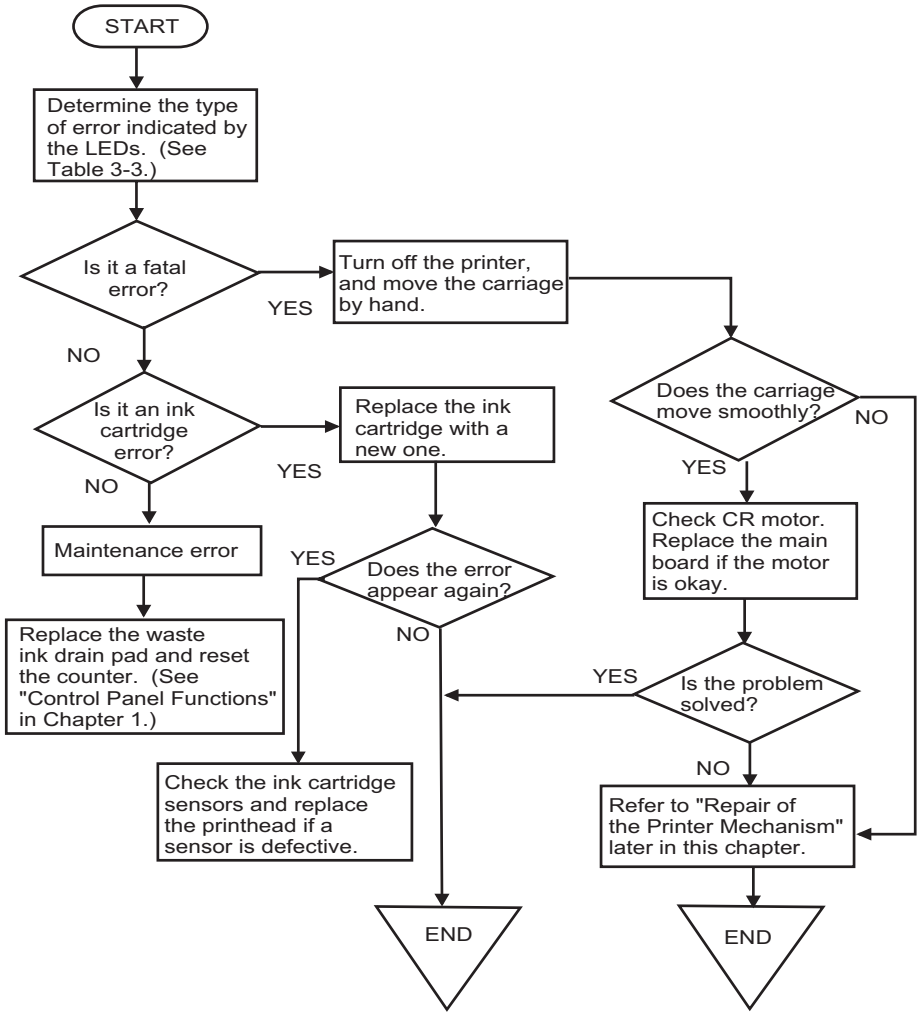
Symptom	Problem	Flowchart No.
Printer does not turn on	LEDs do not light. Printer mechanism does not operate.	Flowchart 1
Error indicated by LEDs	See Table 3-3 to determine the specific error.	Flowchart 2
Printing failure	Printing is not performed. Abnormal printing (missing dots, etc.) Print quality is poor.	Flowchart 3
Paper not feeding correctly	Paper does not load. Paper feeding is irregular. Paper jam occurs.	Flowchart 4
Abnormal control panel operation	Printer does not respond when buttons are pressed.	Flowchart 5

3.2.1 Printer Does Not Turn On



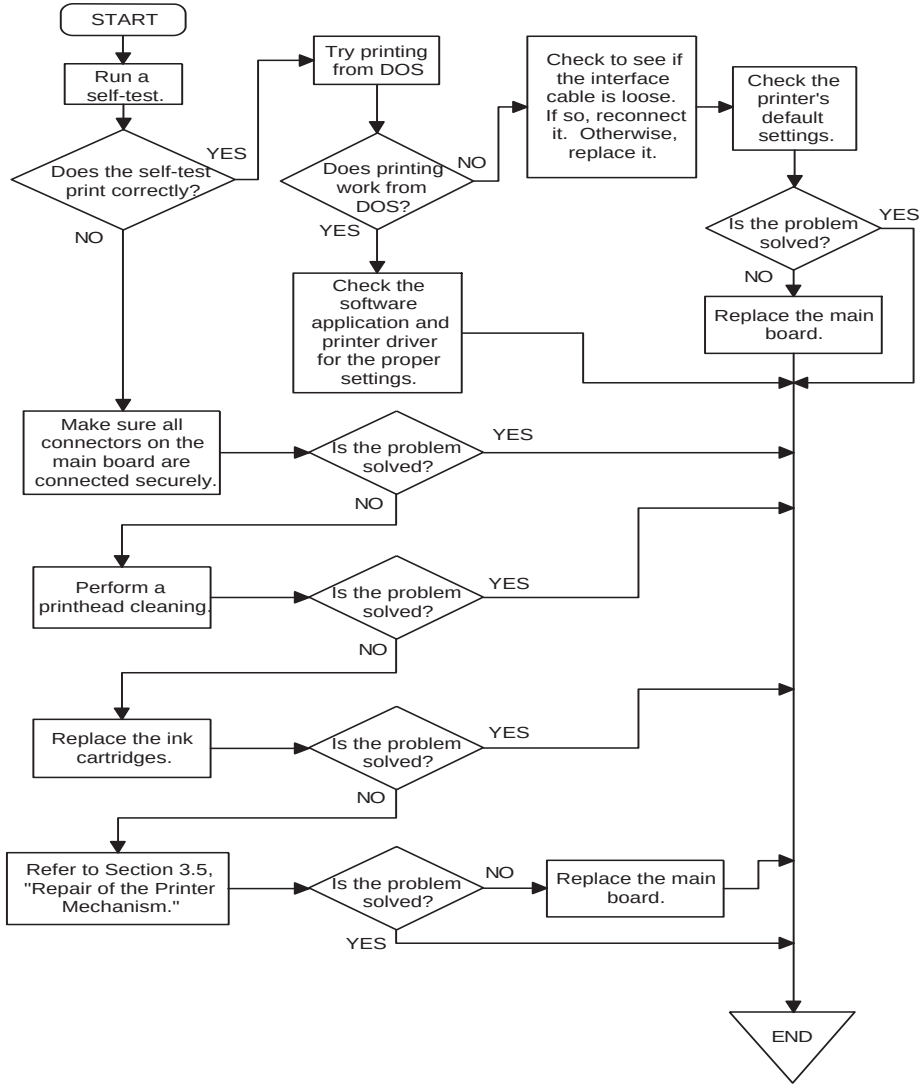
Flowchart 1

3.2.2 Error Indicated by LEDs



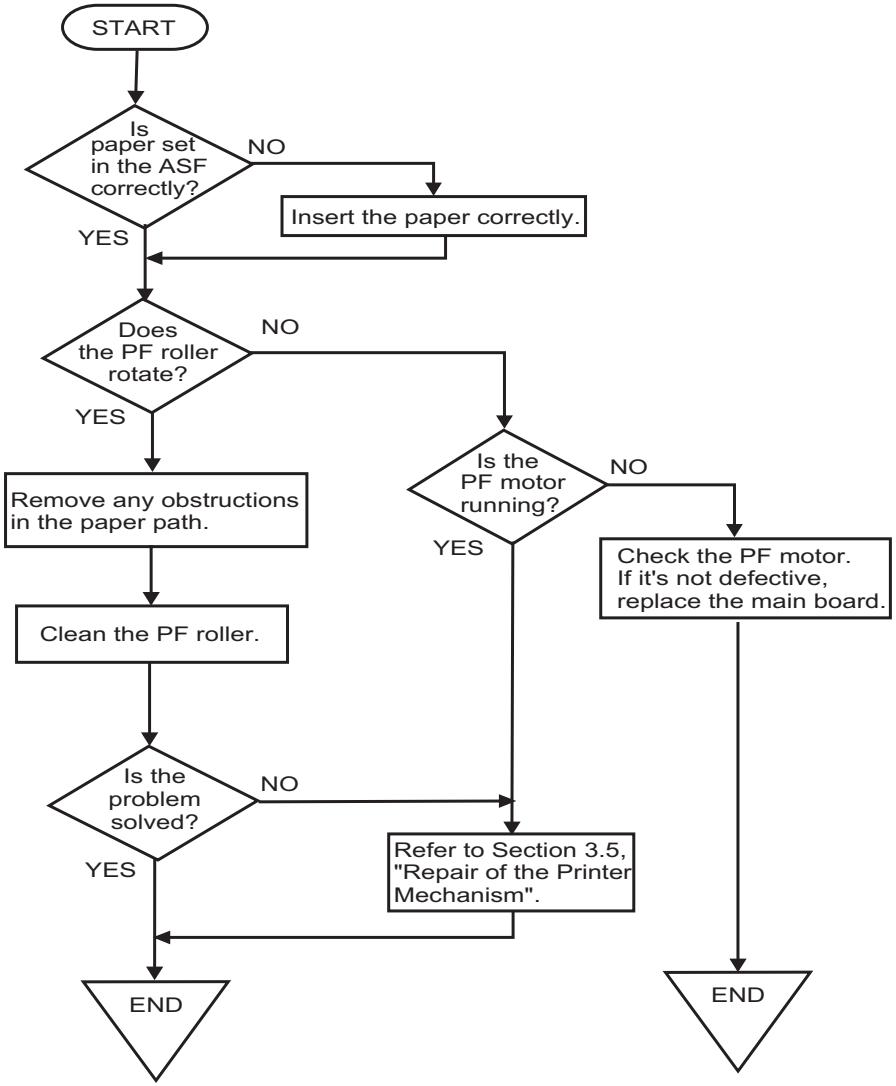
Flowchart 2

3.2.3 Printing Failure



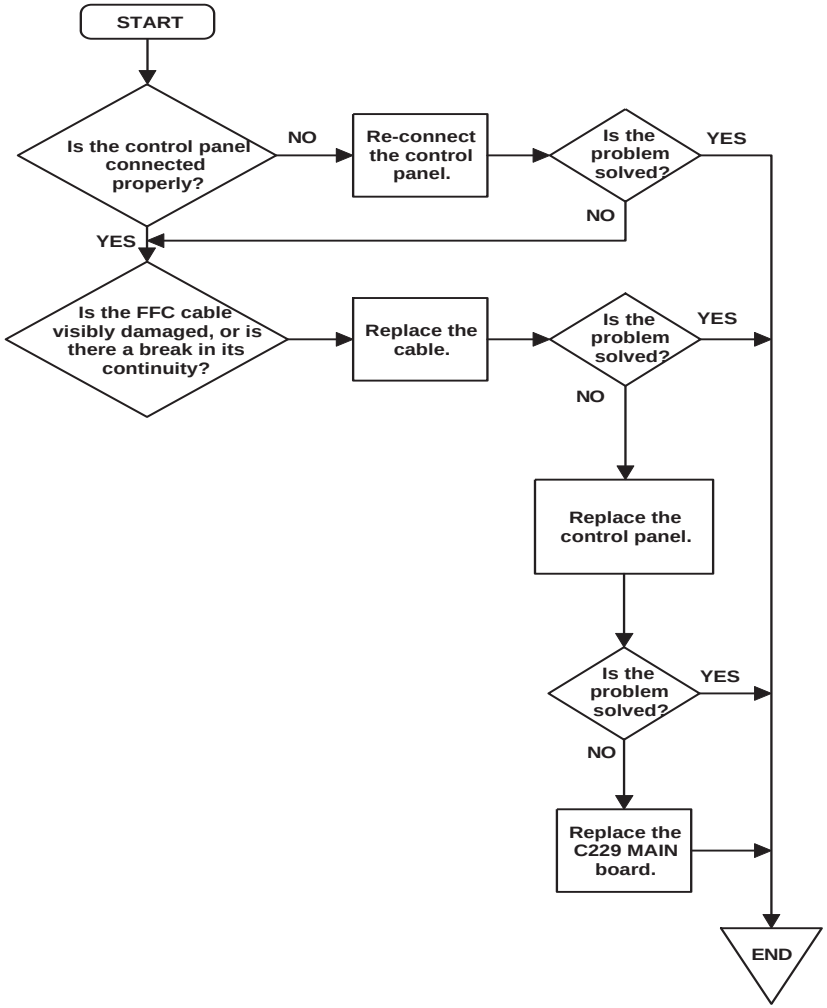
Flowchart 3

3.2.4 Paper Not Feeding Correctly



Flowchart 4

3.2.5 Control Panel Operation is Abnormal



Flowchart 5

3.3 Unit Repair of the Power Supply Board

The names of the power supply boards are:

- S*tylus COLOR 440: C206 PSB/PSE*
- *Stylus COLOR 640: C206 PSB/PSE*
- *Stylus COLOR 740: C257 PSB/PSE*

This section describes problems related to the power supply board. See Table 3-5 below for symptoms and likely causes. Then use the checkpoints to evaluate each component and pinpoint the problem.

Table 3-5. Repair of the C206/C257 PSB/PSE Board

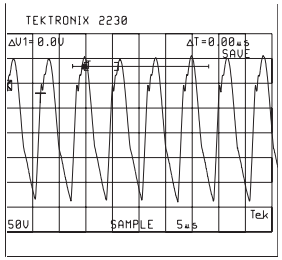
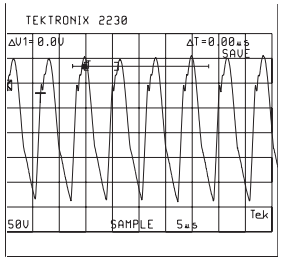
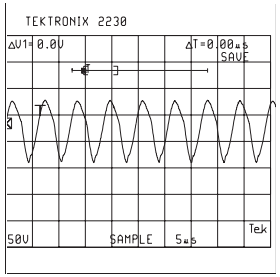
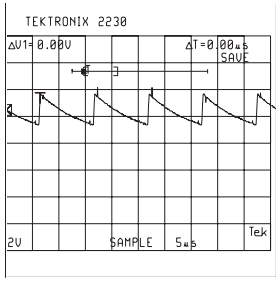
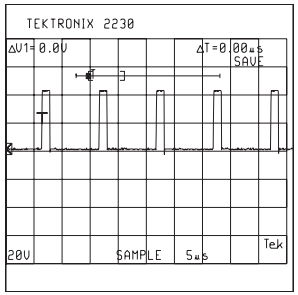
Symptom	Condition	Cause	Checkpoint	Solution
The printer does not operate at all.	+42 V line is dead.	F1 is open.	Check F1 with a multimeter.	Replace F1.
		Transformer coils are open.	Check for a waveform across the drain and source of Q1. If the transformer is open, no voltage (no waveform) should be present. 	Replace T1.
		Switching FET (Q1) is defective.	Check at the drain. If the FET is open, the waveform will be a flat, positive voltage. 	Replace Q1.
		Feedback transistors (Q2, Q3) are defective.	Check at the collector. 	Replace Q2 or Q3.
		+42 V line is abnormal.	Check the following parts. • ZD87, ZD52 • ZD51, ZD81–ZD86 • PC1	Replace malfunctioning parts.

Table 3-5. Repair of the C206/C257 PSB/PSE Board (continued)

Symptom	Condition	Cause	Checkpoint	Solution
(Continued) The printer does not operate at all.	+5V line is dead.	IC51 (L4962E/FA3635P) is defective. ***Note:*** • *L4962 is used for Stylus COLOR 440/640.* • *FA3635P is used for Stylus COLOR 740.*	**Stylus COLOR 440/640 only:** • Check the sawtooth waveform at Pin 5 of IC51. **Stylus COLOR 740** • Sawtooth waveform not measurable. 	Replace IC51.
		IC51 (L4962E/FA3635P) is defective. ***Note:*** • *L4962 is used for Stylus COLOR 440/640.* • *FA3635P is used for Stylus COLOR 740.*	**Stylus COLOR 740:** • Check the switching waveform at pin 7 of IC51. **Stylus COLOR 740:** • Check the switching waveform at Pin 8 of IC51. 	Replace IC51.

3.4 Unit Repair of the Main Board

The name of the main board for each printer is:

- Stylus COLOR 440: C206 MAIN-B or C255 MAIN
- Stylus COLOR 640: C256 MAIN
- Stylus COLOR 740: C257 MAIN

This section describes problems related to the main controller board. See the table below for symptoms and likely causes. Then use the checkpoints to evaluate each component and pinpoint the problem.

Table 3-6. Unit Repair of Main Board

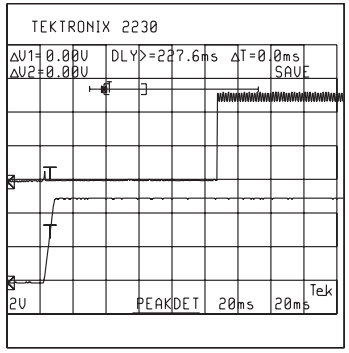
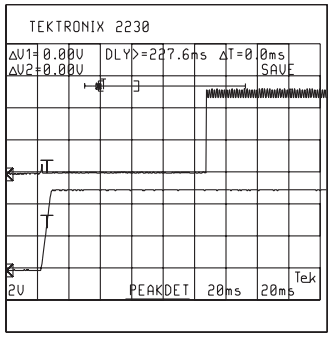
Symptoms	Condition	Cause	Check Point	Solution
The printer does not operate at all.	CPU does not operate.	The reset circuit does not operate.	**Stylus COLOR 440, 640:** Check the waveform of the +5V and /Reset signal of IC9. Pin 7 = +5 volts Pin 6 = /Reset 	Replace IC9.
			Stylus COLOR 740: Check the waveform of the +5V and /Reset signal at IC8. Pin 7 = +5 volts Pin 2 = /Reset 	Replace IC8.
		Control ROM, D-RAM, and Mask ROM are defective, or are not being selected correctly.	**Stylus COLOR 440:** If you cannot find a waveform at the following pins, their respective ICs are defective: Pin 88 of IC1 Pin 20 of IC3 Pin 26 of IC4	**Stylus COLOR 440:** Replace IC1, IC3, or IC4.
			Stylus COLOR 640: If you cannot find a waveform at the following pins, their respective ICs are defective: Pin 97 of IC1 Pin 13 of IC3 Pins 98 and 99 of IC1 Pin 27 of IC5 Pin 14 of IC6	**Stylus COLOR 640:** Replace IC1, IC3, IC5, or IC6
(Continued on the next page.)	(Continued on the next page.)	(Continued on the next page.)		

Table 3-6. Unit Repair of Main Board (continued)

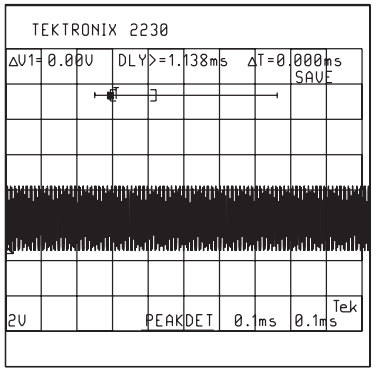
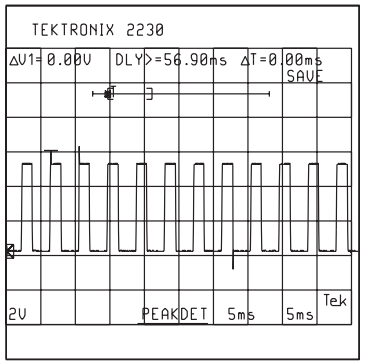
Symptoms	Condition	Cause	Check Point	Solution
(Continued) The printer does not operate at all.	(Continued) CPU does not operate.	(Continued) Control ROM, D-RAM, and Mask ROM are defective, or are not being selected correctly.	**Stylus Color 740:** • If you cannot find a waveform at Pins 2, 128, and 127 of IC1, the chip is defective. • If you cannot find a waveform at Pin 85 of IC2, the chip is defective. • If you cannot find the waveform at 13-pin of IC3, the IC3 is dead. • If you cannot find a waveform at Pin 27 of IC4 or IC5, the respective chip is defective. • If you can not find a waveform at Pin 14 of IC6, the chip is defective.	**Stylus Color 740:** • Replace IC1. • Replace IC2. • Replace IC3. • Replace IC4 or IC5. • Replace IC6.
		Stylus COLOR 440: CRU2 is defective. **Stylus COLOR 640:** CR2 is defective. **Stylus COLOR 740:** CR1 or IC2 is defective.	**Stylus COLOR 440, 640:** Check the waveform at Pins 27 and 28 of IC1. **Stylus COLOR 740:** Check the waveform at Pins 118 and 119 of IC2. Also, check the output waveform at Pin 91 of IC2. 	**Stylus Color 440, 640:** Replace CRU2 or CR2. **Stylus Color 740:** Replace CR1 or IC2.
The carriage does not operate normally. (Continued on the next page.)	The carriage motor does not operate at all or it produces an abnormal noise. (Continued on the next page.)	IC2 is defective.	**Stylus COLOR 440:** Check the waveform at Pins 25 and 18 of IC14. **Stylus COLOR 640:** Check the waveform at Pins 43 and 26 of IC14. **Stylus COLOR 740:** Check the waveform at Pins 27 and 16 of IC11. 	Replace IC2.

Table 3-6. Unit Repair of Main Board (continued)

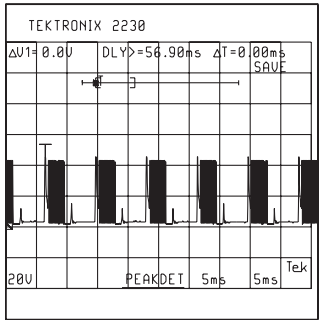
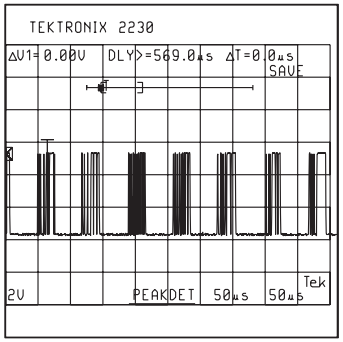
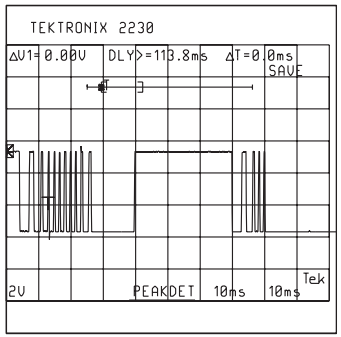
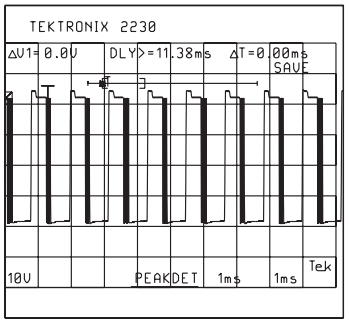
Symptoms	Condition	Cause	Check Point	Solution
(Continued) The carriage does not operate normally.	(Continued) The carriage motor does not operate at all or it produces an abnormal noise.	**Stylus COLOR 440, 640:** IC14 is dead. **Stylus COLOR 740:** IC11 is defective.	**Stylus COLOR 440:** Check the waveform at Pins 6 through 9 of IC14. **Stylus COLOR 640:** Check the waveform at Pins 3, 6, 18, and 21of IC14. **Stylus COLOR 740:** Check the waveform at Pins 6 through 9 of IC11. 	**Stylus COLOR 440, 640:** Replace IC14. **Stylus COLOR 740:** Replace IC11.
Printing is abnormal.	The printer does not print.	The trapezoidal waveform is not being generated.	**Stylus COLOR 440:** Check the trapezoidal waveform at the base of Q7 or Q9 on the C206 Main-B or C255 Main board. **Stylus COLOR 640:** Check the trapezoidal waveform at the base of Q7 or Q9 on the C256 Main board. **Stylus COLOR 740:** Check the trapezoidal waveform at the base of Q2 or Q3 on the C257 Main board.	**Stylus COLOR 440:** Replace IC6, Q7, or Q9. **Stylus COLOR 640:** Replace IC7, Q7, or Q9. **Stylus COLOR 740:** Replace IC14, Q2, or Q3.
		IC2 is defective.	**Stylus COLOR 440, 640:** Check the clock signal for the trapezoidal waveform at Pin 80 of IC2. **Stylus COLOR 740:** Check the clock signal for the trapezoidal waveform at Pin 174 of IC2. 	Replace IC2.

Table 3-6. Unit Repair of Main Board (continued)

Symptoms	Condition	Cause	Check Point	Solution
Paper feed operation is abnormal.	Paper feed motor does not work.	IC2 is defective.	**Stylus COLOR 440:** Check the waveform at Pins 25 and 18 of IC14. **Stylus COLOR 640:** Check the waveform at Pins 43 and 26 of IC16. **Stylus COLOR 740:** Check the waveform at Pin 7 of IC12 and IC13. 	Replace IC2
		Stylus COLOR 440, 640: IC15 is defective. **Stylus COLOR 740:** IC12 or IC13 is defective.	**Stylus COLOR 440:** Check the output waveform of Pins 6 through 9 of IC15. **Stylus COLOR 640:** Check the output waveform of Pins 3, 6,18, and 21 of IC15. **Stylus COLOR 740:** Check the output waveform of Pins 10 and 15 of IC12 and IC13. 	**Stylus COLOR 440, 640:** Replace IC15 **Stylus COLOR 740:** Replace IC12 or IC13.

3.5 Repair of the Printer Mechanism

This section provides instructions for repairing the printer mechanism. It describes various problems, likely causes, and solutions. Look up the symptom in the table below and check for malfunctioning parts as described in the checkpoint.

Table 3-7. Repair of the Printer Mechanism

Symptom	Condition	Cause	Checkpoint	Solution
Abnormal pump mechanism operation	Abnormal PF motor operation when the power is turned on.	Foreign substances are lodged in the PF gears.	Manually turn the platen drive gear and check whether it rotates normally.	Remove any foreign substances.
		The PF motor is defective. (Refer to Table 3-1)	Check the coil resistance.	Replace the PF motor.
Ink is not absorbed or is poorly absorbed.	Used ink does not go through the waste ink tube.	The pump tube is crushed.	Inspect the tube.	Use compressed air to fix the crushed part.
		Capping rubber is damaged or deformed.	Inspect the capping rubber.	Replace the capping mechanism.
		The tube has pulled loose from the cap.	Inspect the tube's attachment to the cap.	Connect the tube properly.
		Air bleed valve does not close properly.	Check bleed valve operation by hand.	Replace the capping mechanism.
Abnormal carriage operation.	The carriage doesn't travel smoothly on the carriage guide shaft, or moves irregularly.	Foreign substance in the CR drive gear.	Check for foreign substances.	Remove foreign substances.
		CR motor is defective.	Check motor coil resistance.	Replace the CR motor.
		Carriage movement is not smooth.	Check whether the carriage moves smoothly when moved manually.	Clean and lubricate the carriage guide shaft.
			Check tension of the timing belt.	Adjust tension mechanism or replace it.
			Check for foreign substances in the carriage path.	Remove foreign substances.

Table 3-7. Repair of the Printer Mechanism (continued)

Symptom	Condition	Cause	Checkpoint	Solution
Abnormal printing	A particular dot consistently causes abnormal printing.	Printhead surface is not clean (dot missing).	Perform the cleaning operation several times and check printing.	Perform the cleaning operation.
		The printhead is defective.	Perform the cleaning operation several times and check printing.	If condition does not improve even after the cleaning, replace the head.
		The pad in the capping mechanism is touching the head surface.	Check to see if the pad is deformed or out of position.	Replace or reposition the pad.
	A particular dot sometimes fails to print.	Print head surface is not clean (dot missing).	Perform the cleaning operation several times and print a self-test.	Perform the cleaning.
		The head FFC is defective (open circuit).	Check the FFC with a meter.	Replace the head FFC.
		The head FFC is loosely connected.	Check if the FFC is securely connected to the board and carriage.	Connect the FFC properly.
		The printhead is defective.	Perform the cleaning operation several times and check the printing after each cleaning.	If the condition does not improve even after several cleaning operations, replace the printhead.
		The ink cartridge is defective.	Install the new ink cartridge and perform self-test.	Replace the ink cartridge.
	Black specks or dots appear.	The head FFC is loose.	Check if the FFC is securely connected to the board and carriage.	Connect the FFC properly.
		The printhead is detective.	Check connection with the head FFC.	Replace the head if there is no connection problem with the FFC.
	A vertical line is not aligned.	Bi-directional alignment is out of adjustment.	Perform the Bi-D adjustment.	Refer to "Bi-D Adjustment" in Section 5.2.2.10.
	White lines appears on the printed page.	Head angle is not correct.	Perform the head angle adjustment.	Refer to "Head Angle Adjustment" in Section 5.2.2.9.
		Platen gap is not correct.	Perform the platen gap (parallelism) adjustment.	Refer to "Parallelism Adjustment" in Section 5.2.1.
		Ink jet is deflected by foreign substances on the printhead.	Perform the cleaning operation several times and check printing.	Perform the cleaning operation.
		Ink cartridge is defective.	Install a new ink cartridge and perform the self-test.	Replace the ink cartridge.
		Printhead is defective.	Perform the cleaning operation several times and check printing.	If printing fails to improve after cleaning the printhead, replace the printhead.

Table 3-7. Repair of the Printer Mechanism (continued)

Symptom	Condition	Cause	Checkpoint	Solution
Printing is not performed.	The carriage moves, but no printing is performed.	Head FFC is loose.	Check for proper connection.	Connect the FFC properly.
		The FFC is defective.	Check the FFC by using a tester. Also, examine visually for burn marks.	Replace the FFC.
		Ink cartridge is defective.	Install a new cartridge and perform the self-test.	Replace the ink cartridge.
		Printhead is defective.	If the condition does not improve even after performing two or three cleaning cycles, replace the printhead and perform the self-test.	Replace the printhead.
Abnormal paper feeding.	Paper does not feed.	PF roller experiencing friction with bushing or with adjacent parts.	Check if the PF roller rotates when paper is not fed.	Clean the PF roller by using a cleaning sheet. Replace the PF roller if it does not recover.
		Abnormal operation of the auto-sheet feeder.	Check movement of the ASF by hand.	Replace ASF.
		Malfunctioning ASF transmission.	Check to see if the transmission gears rotate. Push against the sheet feeder clutch and check to see if the gears mesh properly.	Replace the gears or the transmission mechanism.
Printer stops during initialization.	Fatal error appears.	ASF sensor is defective.	Check the signal level of the ASF sensor. (See Table 3-2.)	Replace ASF sensor.
		PE sensor is defective.	Check the signal level of the PE sensor. (See Table 3-2.)	Replace PE sensor.
		HP sensor is defective.	Check the signal level of the HP sensor. (See Table 3-2.)	Replace HP sensor.
		Printhead FFC is disconnected.	Check if the FFC is disconnected.	Reconnect the FFC.
		CR motor is defective.	Check that the CR motor cable is connected.	Replace the CR motor if there is no problem with the cable connection.
		PF motor is defective.	Check that the PF motor cable is connected.	Replace the PF motor if there is no problem with the cable connection.

CHAPTER

4

DISASSEMBLY AND ASSEMBLY

4.1 Overview

This chapter tells you how to disassemble the main components of the EPSON Stylus Color 440, 640, and 740. Unless otherwise noted, you can reassemble the components by reversing the order in which you took them apart. Before disassembling or reassembling any unit, look for special cautions under the heading "CAUTION." After reassembly, you must perform any adjustments listed under "REQUIRED ADJUSTMENT."

NOTE: Unless stated otherwise, the terms "left" and "right" as used in this chapter refer to the left and right sides of the printer as viewed from the front.

4.1.1 Precautions for Disassembling the Printer

Before servicing the printer, read the instructions below under "WARNING" and "CAUTION." The warnings tell you how to avoid mistakes that could result in injury or death. The cautions tell you how to avoid damaging the printer.

- **Disconnect the power cable before taking apart the printer.**
- **Wear protective goggles to protect your eyes from ink and flying springs. If ink gets in your eyes, flush your eyes with water and see a doctor immediately.**
- **If ink comes into contact with your skin, wash it off with soap and water. If irritation occurs, contact a physician.**
- **A lithium battery is installed on the main board of this printer. Be sure to observe the following precautions when handling the battery:**
  - Keep the battery away from metal objects or other batteries to avoid shorting it out.
  - Do not heat the battery or put it in fire.
  - Do not solder onto any part of the battery. (Doing so may cause the battery to leak electrolyte, burn, or explode. Leakage may damage other devices close to the battery.)
  - Do not charge the battery, or it may explode.
  - Do not dismantle the battery, because it may release harmful gas or explode.
  - Do not install the battery backwards.
- **To avoid explosion, replace only with the same or equivalent type recommended by the manufacture. Dispose of used batteries according to local laws and regulations.**

CAUTION

- **If an ink cartridge is removed and needs to be installed again, be sure to replace it with a new ink cartridge for the following reasons:**
  - Once an ink cartridge is removed, air enters the cartridge and creates bubbles. These bubbles clog the ink path and cause printing problems.
  - If the same ink cartridge is reused, the printer will not be able to keep track of actual ink consumption, since the ink consumption counter will be cleared.
- **Do not remove the ink cartridges when you ship the printer.**
- **Never remove the ink cartridges, unless this manual specifically tells you to do so.**
- **Use only recommended tools for disassembling, assembling, and adjusting the printer.**
- **Apply lubricants and adhesives only as specified. (See Chapter 6 for details.)**
- **Make all required adjustments after taking apart the printer. (See Chapter 5 for details.)**

4.1.2 Tools

Table 4-1 lists the tools recommended for servicing the printer. Use only tools that meet these specifications.

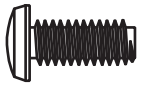
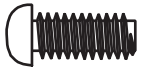
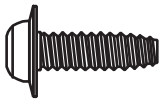
Table 4-1. Tool List

Tools	Commercially Available	EPSON Part No.
Philips scewdriver No.1	yes	B743800400
Philips screwdriver No.2	yes	B743800200
Tweezers	yes	B741000100
Hexagonal box driver (5.5 mm)	yes	B741700100

4.1.3 Specification for Screws

Table 4-2 shows screw specifications. During assembly, make sure to insert the correct screw at each location. Note that the screw numbers referred to in the manual (e.g., "#1") correspond to the numbers of the screw types shown in the table, not to screw sizes.

Table 4-2. Screw Characteristic

Type Number	Body	Name	Size
1		Cross bind-head, S-tight	M3 × 6
2		Cross bind-head, S-tight	M3 × 10
3		Cross bind-head, P-tight (CBP tight)	M3 × 6
4		Cross bind-head, P-tight (CBP tight)	M3 × 10
5		Cross bind-head, P-tight (CBP tight)	M3 × 8
6		Cross pan-head (CP)	M3 × 4
7		Cross bind-head, S-tight, Sems R2 (CBS Sems)	M3 × 6

4.1.4 Service Checklist

Before returning the printer after servicing, you may wish to use the checklist below to make sure the printer is in good condition.

Table 4-3. Inspection Checklist for the Repaired Printer

Category	Component	Item to check	Is Check Required?
Printer	Self-test	Is the operation normal?	☐Checked / ☐Not necessary
	On-line test	Was the on-line test successful?	☐Checked / ☐Not necessary
	Printhead	Is ink ejected normally from all nozzles?	☐Checked / ☐Not necessary
	Carriage mechanism	Does the carriage move smoothly?	☐Checked / ☐Not necessary
		Any abnormal noise during movement?	☐Checked / ☐Not necessary
		Any dirt or obstructions around the carriage guide shaft?	☐Checked / ☐Not necessary
		Is the CR motor at the correct temperature (not overheating)?	☐Checked / ☐Not necessary
	Paper feeding mechanism	Is paper fed smoothly?	☐Checked / ☐Not necessary
		Does paper get jammed?	☐Checked / ☐Not necessary
		Does paper get skewed during paper feeding?	☐Checked / ☐Not necessary
		Does more than one sheet of paper feed at a time?	☐Checked / ☐Not necessary
		Does the PF motor get overheated?	☐Checked / ☐Not necessary
		Any abnormal noise during paper feeding?	☐Checked / ☐Not necessary
		Is the paper path clear of all obstructions?	☐Checked / ☐Not necessary
Adjustments	Specified adjustment items	Are adjusted conditions all right?	☐Checked / ☐Not necessary
Lubrication	Specified lubrication items	Is lubrication applied to the specified locations?	☐Checked / ☐Not necessary
		Is the quantity of lubrication neither too much nor too little?	☐Checked / ☐Not necessary
System program	PROM	Does it have the newest version?	☐Checked / ☐Not necessary
Shipping	Ink cartridges	Are the ink cartridges installed correctly?	☐Checked / ☐Not necessary
	Packaging	Are all loose parts firmly fixed?	☐Checked / ☐Not necessary
Miscellaneous	User's belongings	Are all the user's belongings included?	☐Checked / ☐Not necessary

4.2 Disassembly Procedures

The flowchart below shows the order of disassembly.

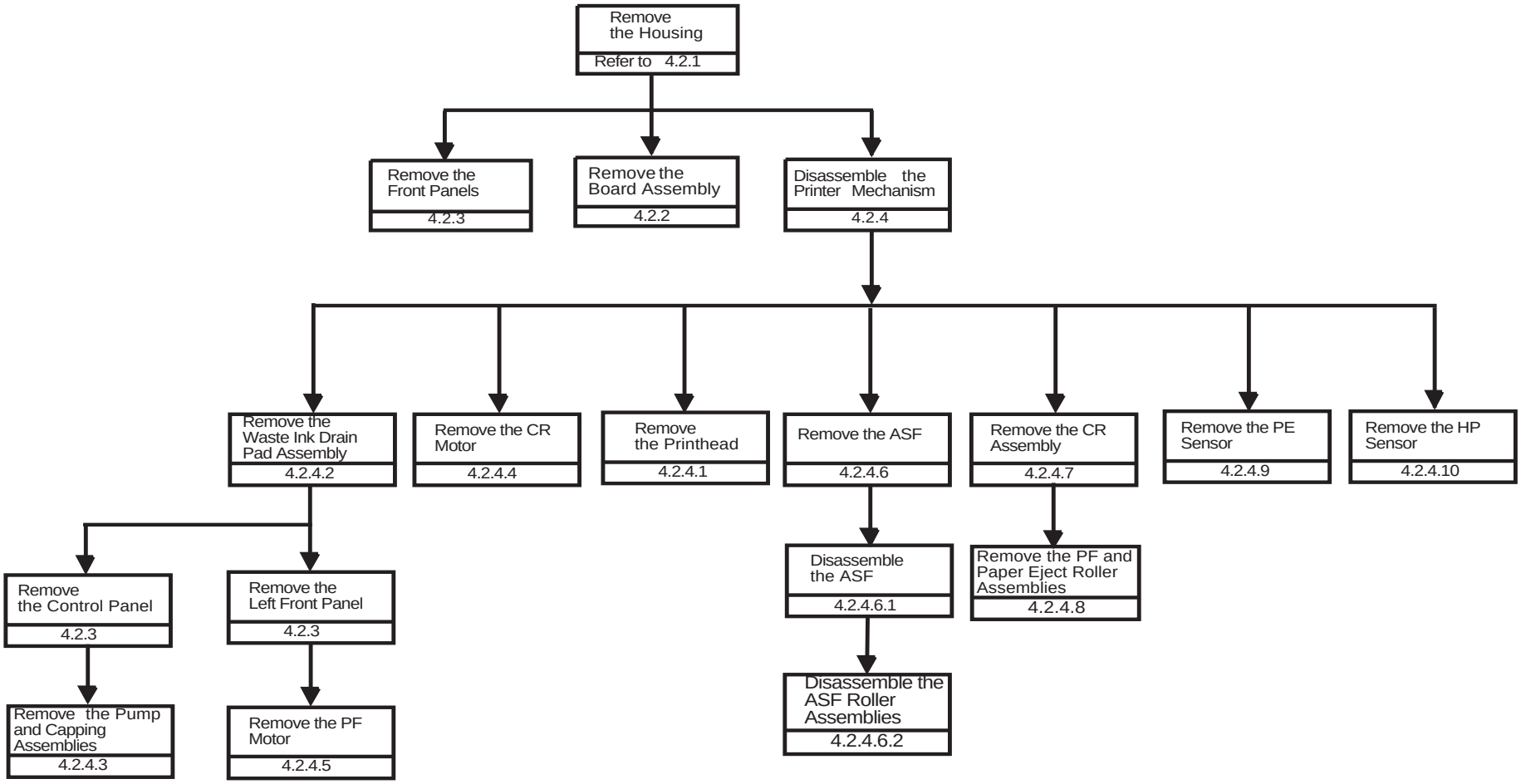


Figure 4-1. Disassembly Flowchart

4.2.1 Removing the Housing

The printer does not have a lower housing. Therefore, the printer mechanism is fully exposed after you remove the upper housing.

1. Open the printer cover and turn the PG adjustment lever towards the + side (toward the rear).
2. Take out the 4 screws (No. 2) securing the housing, and lift the housing up to remove it.

CAUTION

Be careful not to catch the housing on the ink cartridge clamps. If you release a clamp, it could cause air to invade the ink cartridge.

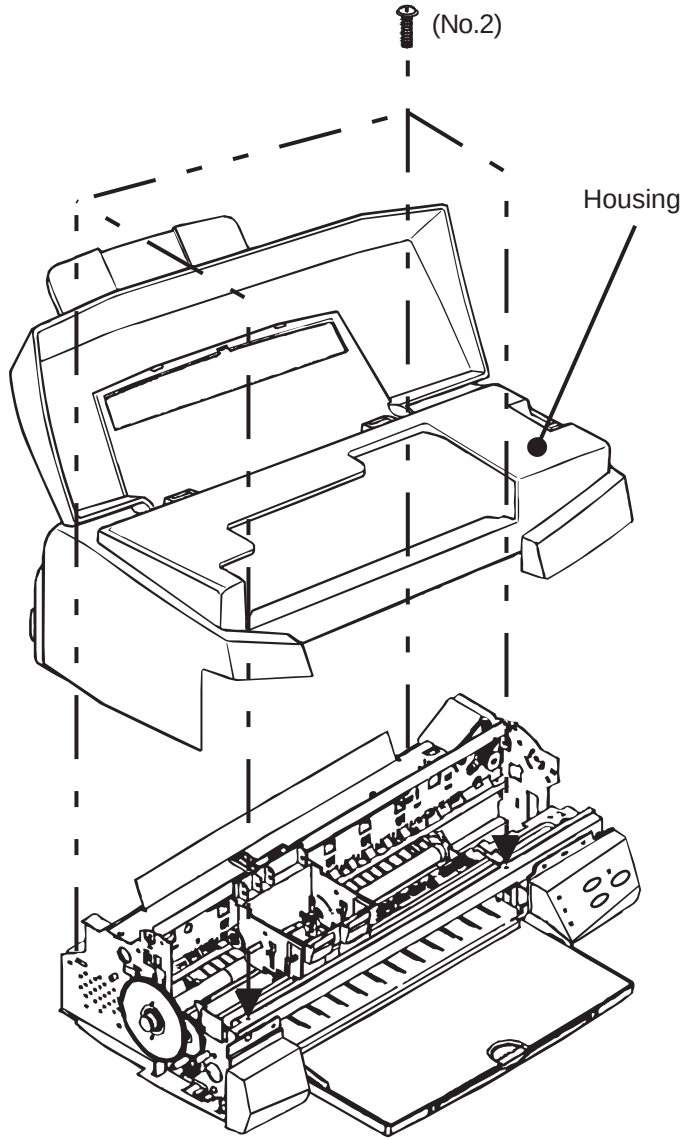


Figure 4-2. Removing the Housing

4.2.2 Removing the Board Assembly

The power supply board and the main board must be removed together, since they are mounted on a single bracket.

1. Remove the housing. (Refer to Section 4.2.1.)
2. Remove the 5 screws (No. 1) securing the shield plate to the printer mechanism. See Figure 4-3.
3. Pull the shield plate out part way and remove the cables from the two cable holders (their location is shown in Figure 4-3). Then detach the connectors from the main board.
   - Stylus COLOR 440 and 640:
     CN11 black
     CN4 yellow
     CN5 white
     CN3 control panel FFC
     CN6 CR motor FFC
     CN7 PF motor FFC
     CN8 printhead FFC
   - Stylus COLOR 740:
     CN11 black
     CN4 white
     CN5 yellow
     CN6 control panel FFC
     CN7 CR motor FFC
     CN8 PF motor FFC
     CN9 printhead FFC

   When you plug the cables back in, note that the CR motor and PF motor cables come from opposite sides of the printer and do not cross when inserted into the proper connectors.
4. After removing all the cables from the main board, take the shield plate out of the printer mechanism.
5. To remove the boards from the shield plate, disconnect the main board from the power supply board at CN6. Then take out the screws holding each board in place. See Figure 4-4. The main board has 9 screws (7 No.1 screws on the board itself, and 2 No.6 screws on the interface connector). The power supply board has 4 No.1 screws.

On the main board, connectors CN 6,7,10 (for the 440 and 640) and CN 7,8,10 (for the 740) have connector locks. Be sure to release the locks by pulling up on the two tabbed ends before removing the cables. Also, make sure to press down on the locks when re-connecting the cables.

Be sure to perform the following adjustments when the main board is replaced:

1. **Head voltage ID input (see "Head Voltage ID Input" in Chapter 5)**
2. **Bi-D adjustment (refer to "Bi-D Adjustment" in Chapter 5)**

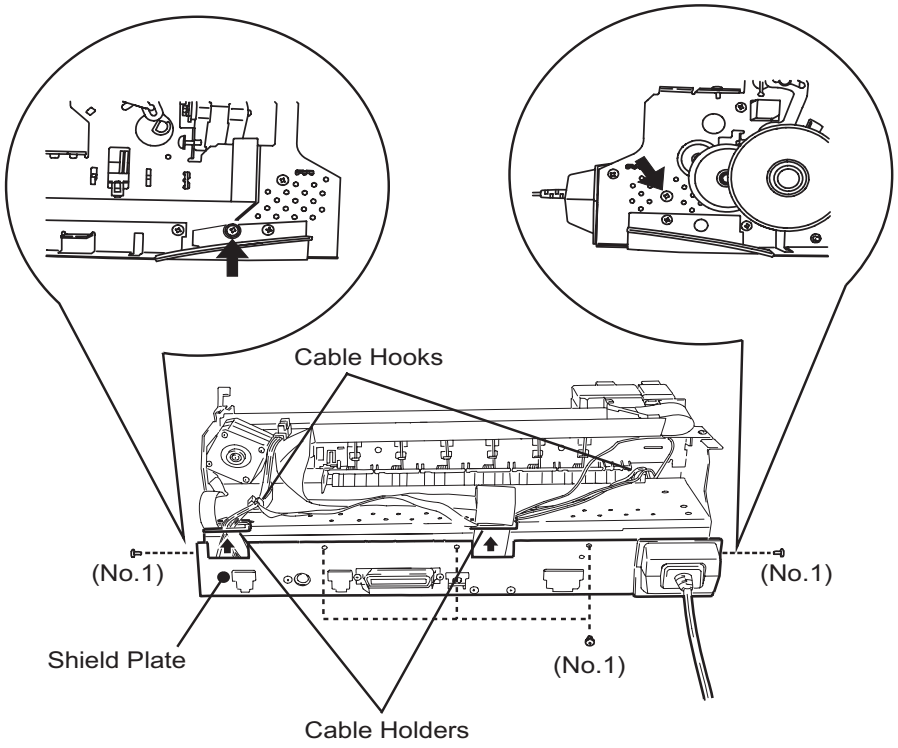


Figure 4-3. Removing the Shield Plate

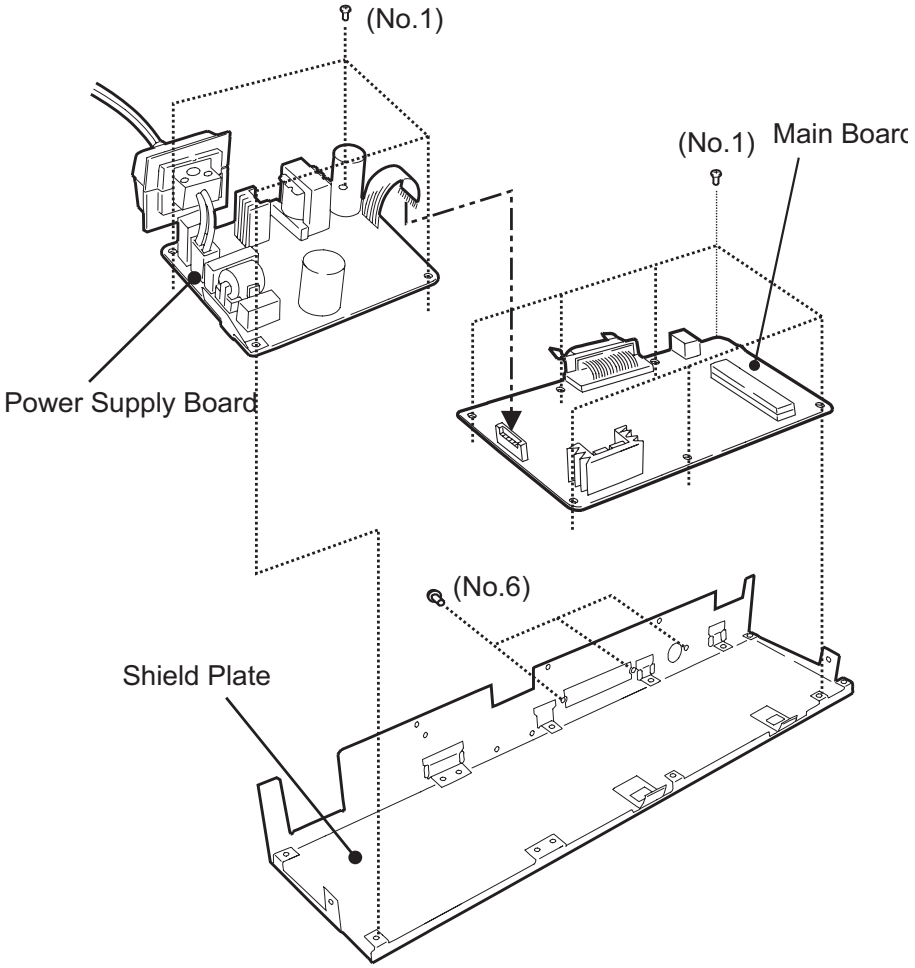


Figure 4-4. Removing the Boards

4.2.3 Removing the Front Panels

1. Remove the housing. (See Section 4.2.1.)
2. Remove 1 screw (No.1) to detach the left panel housing. Note that the paper output tray will come loose with the panel housing.
3. Take out the 2 screws (No.1) securing the control panel and remove the control panel from the printer mechanism.
4. Disconnect the FFC from the connector on the C206/209 PNL board.
5. Remove the 2 screws (No.3) securing the panel board assembly and remove C206/209 PNL board from the panel assembly.

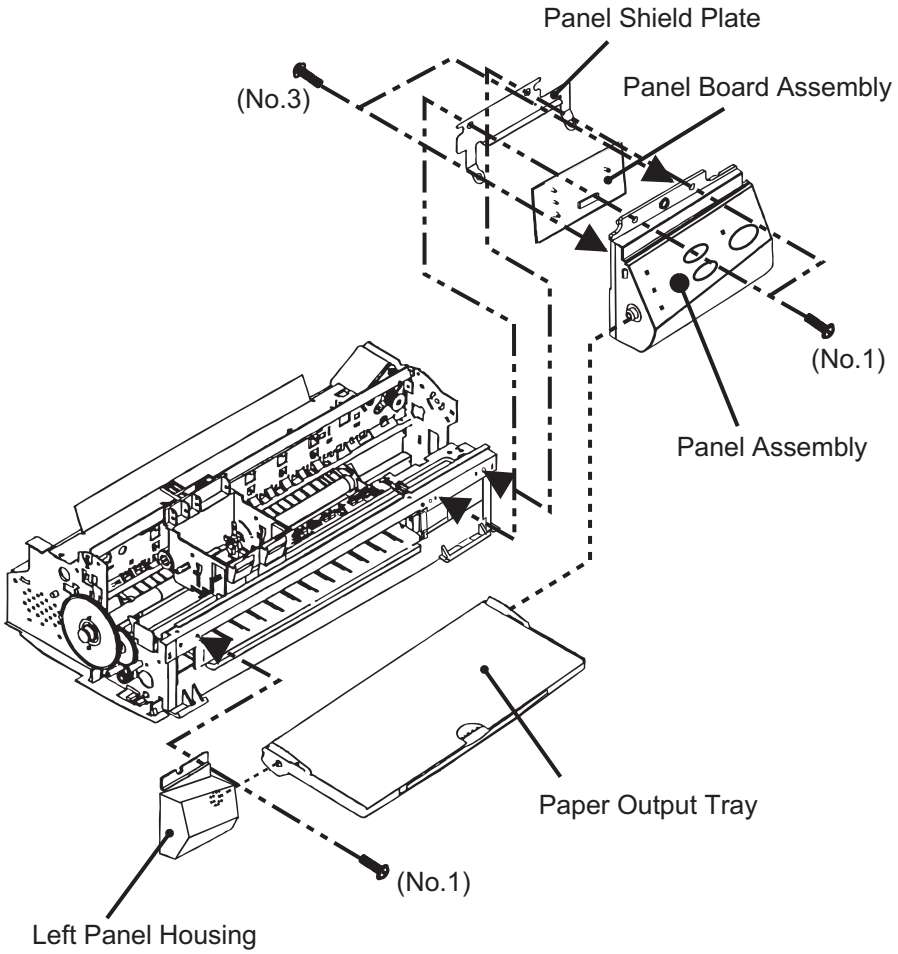


Figure 4-5. Removing the Front Panels

4.2.4 Disassembling the Printer Mechanism

This section explains how to remove the main parts of the printer mechanism.

4.2.4.1 Removing the Printhead

1. Remove the housing. (Refer to Section 4.2.1.)
2. Move the printhead all the way to the right to free the carriage locking mechanism.
3. Rotate gear 67.2 forward to release the carriage lock mechanism. (Gear 67.2 is the biggest gear on the left side of the printer. See Figure 4-6.) Then move the carriage left, to the middle of the printer.
4. Take the black and color ink cartridges out of the carriage.
5. Remove the blue ink cartridge clamps from the carriage assembly.
6. Remove torsion spring 49 from the left side of the printhead. Then remove the printhead securing screw (No. 3) on the right side. Remove the printhead fastener (the metal bar across the bottom of the carriage unit).
7. Remove the FFC from the clips holding it on the carriage assembly, and remove the printhead from the carriage.
8. Disconnect the FFC from the connector on the driver board built into the printhead unit.

CAUTION

- **When you put the printhead back in the carriage, make sure that the locating pin on the carriage fits inside the notch on the printhead. See Figure 4-7.**
- **Since the ink cartridges cannot be reused after taking them out, be sure to replace them with new ones.**
- **When you package the printer for shipping, be sure that new cartridges have been installed and that the carriage is locked in its home position.**

ADJUSTMENT REQUIRED

After replacing the printhead, perform the following adjustments:

1. **Initial ink charge**
2. **Head voltage ID input**
3. **Head angle adjustment**
4. **Bi-D adjustment**

See Chapter 5 for more details.

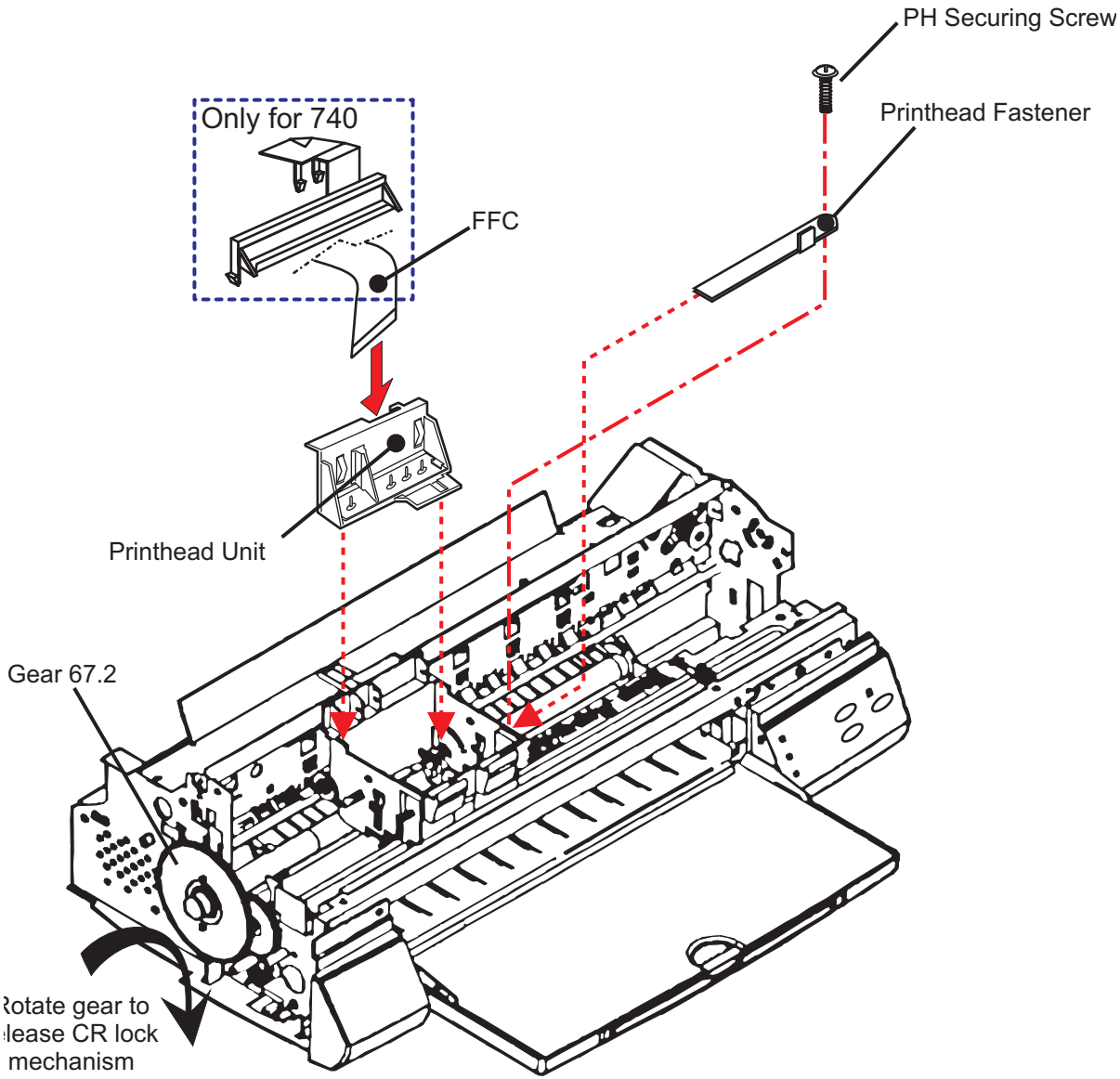


Figure 4-6. Removing the Printhead

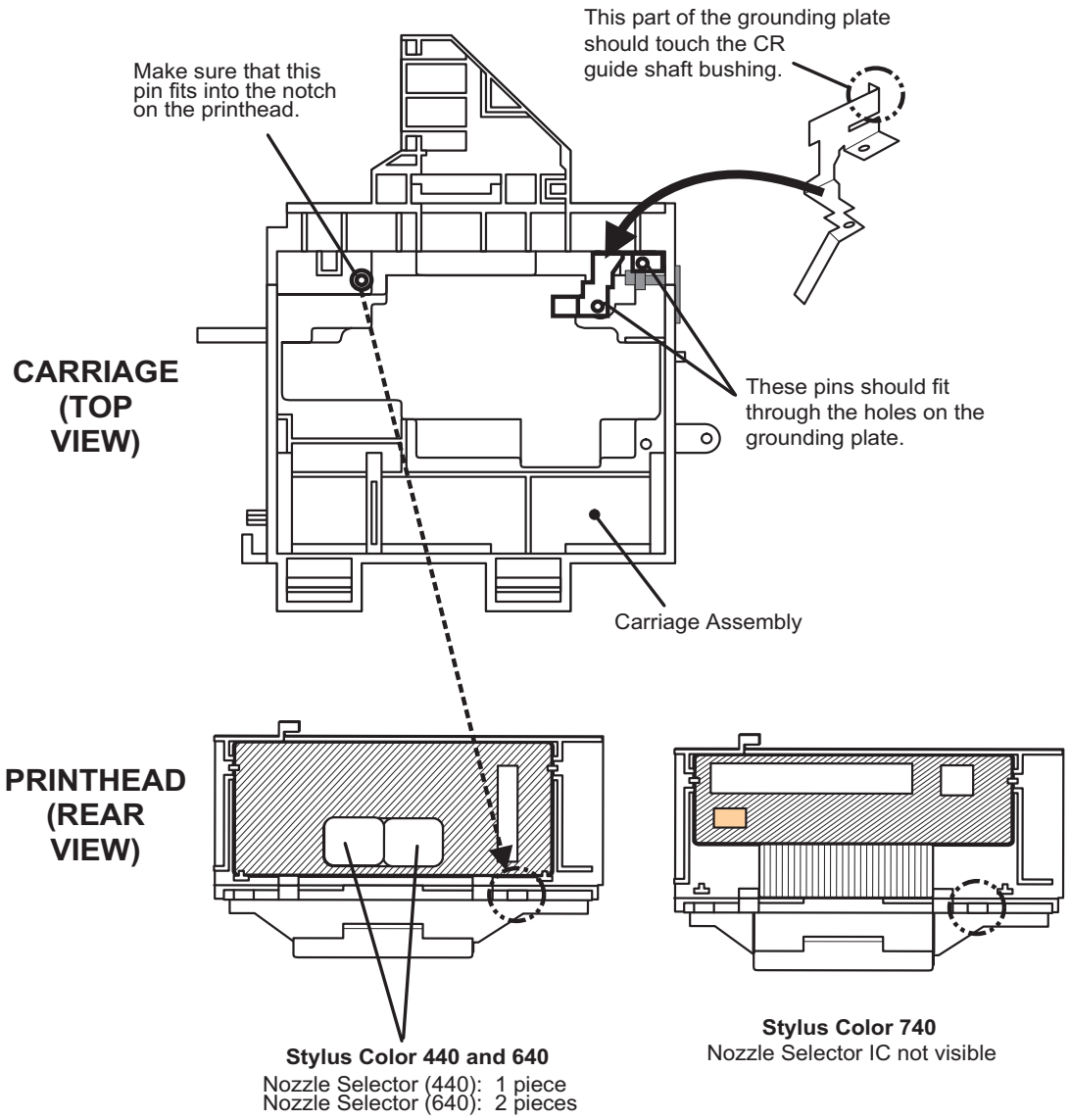


Figure 4-7. Installing the Printhead

4.2.4.2 Removing the Waste Ink Pad Assembly

1. Remove the housing. (Refer to Section 4.2.1.)
2. Remove the 1 screw (No.4) securing the waste ink pad assembly to the frame on the lower-right side of the printer.
3. While pulling down on the right side of the waste ink pad assembly, pull out the locking plate on the left. Then remove the assembly.

CAUTION

When installing the waste ink pad assembly, be sure to replace the locking plate.

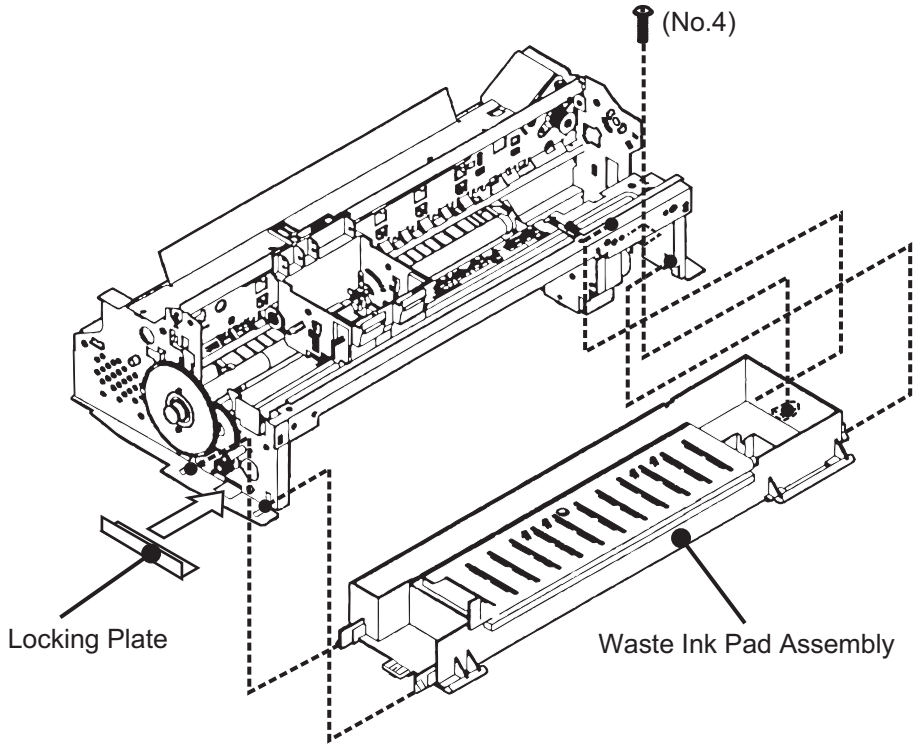


Figure 4-8. Removing the Waste Ink Pad Assembly

4.2.4.3 Removing the Pump and Capping Assemblies

1. Remove the housing. (Refer to Section 4.2.1.)
2. Remove the control panel. (Refer to Section 4.2.3.)
3. Remove the waste ink pad assembly. (Refer to Section 4.2.4.2.)
4. Remove the 2 screws located on the right-front edge of the paper eject frame. See Figure 4-9. Then loosen the screw located on the left-front edge of the paper eject frame. This loosens the front frame and facilitates access to the parts underneath.
5. To remove the capping mechanism, release the hooks that secure the it to the right side of the frame. See Figure 4-9. Lift up the capping mechanism by its right end to free the hooks on its left end. Then remove it by lowering it out the bottom of the printer. Note that the capping mechanism is still connected to the pump assembly by the ink drain tube.
6. Tilt the printer back so that you can see the bottom of the printer mechanism. See Figure 4-9.
7. To remove the pump assembly, take out the 2 screws (No.5) securing the pump assembly to the frame. See Figure 4-9.
8. Release the hook securing the pump assembly to the frame and remove the pump assembly. See Figure 4-9.

CAUTION

- **The head cleaning blade must be fully retracted when the pump is removed. Otherwise, a spring in the pump assembly will cause parts to fly out when you remove the assembly.**
- **Do not damage the black rubber seal around the edge of the ink cap. If it gets damaged, the printhead cannot be cleaned properly and will malfunction.**
- **When handling the head cleaning blade, observe the following points:**
  - Do not touch the blade with your bare hands. Use gloves or tweezers.
  - Do not let oil or grease come in contact with the blade.
  - When installing the cleaning blade, the rubber half must face the right side of the printer, and the felt half must face the left.
- **Do not over-tighten the two screws securing the pump assembly to the frame.**
- **Be careful not to crush or crimp the ink drain tube connecting the pump and capping assemblies.**

CHECK POINT

- Figure 4-10 **shows how to reassemble the pump components.**
- **After installing the pump assembly, make sure that the head cleaner blade moves back and forth by rotating gear 67.2.**

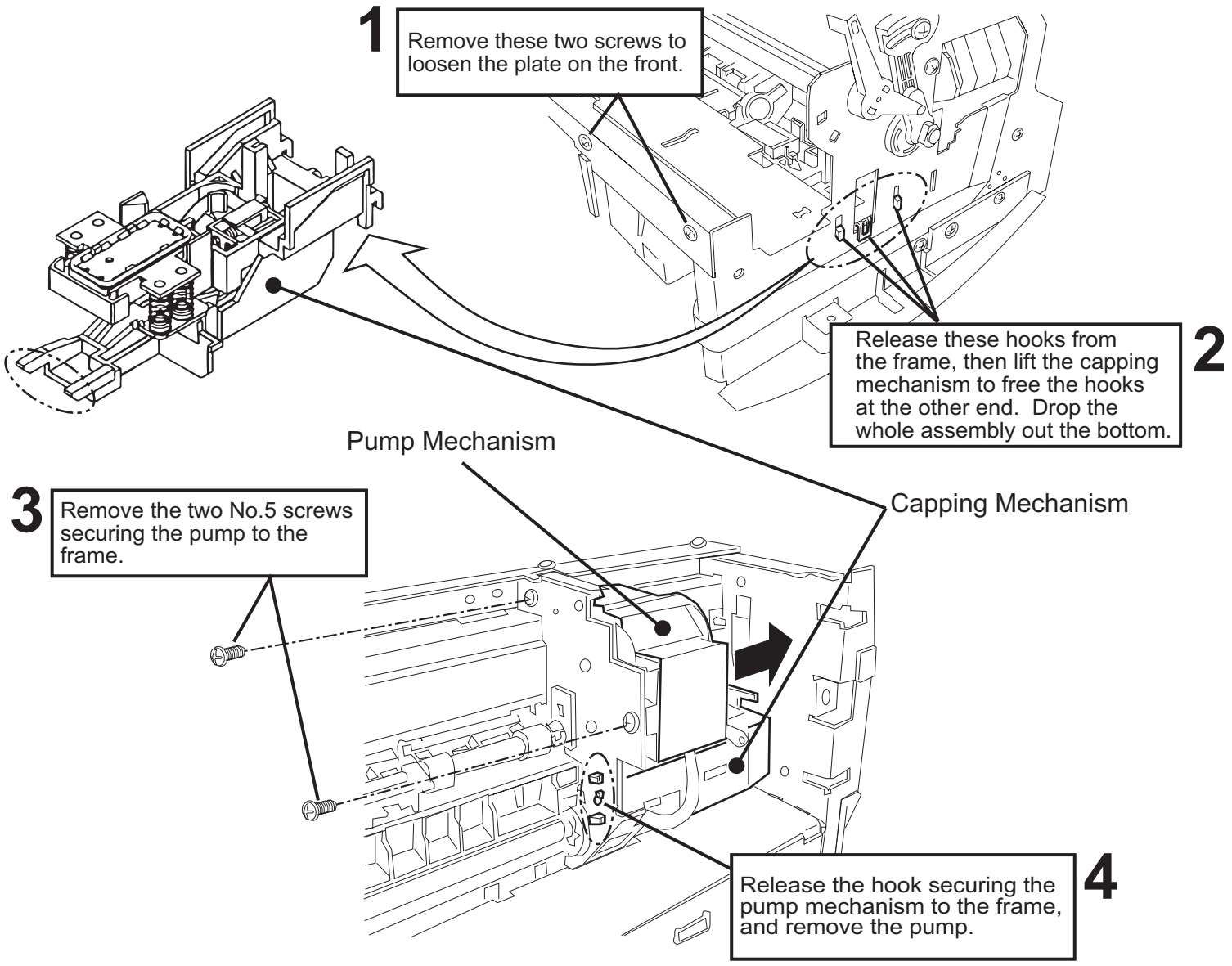


Figure 4-9. Removing the Pump and Capping Assemblies

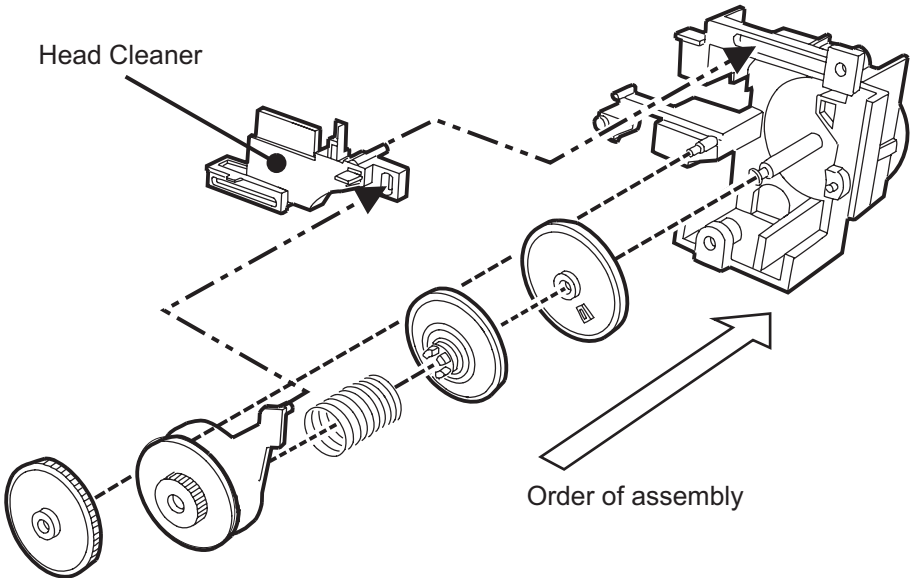


Figure 4-10. Pump Reassembly

4.2.4.4 Removing the CR Motor

1. Remove the housing. (Refer to Section 4.2.1.)
2. Move the printhead all the way to the right to free the carriage lock mechanism.
3. Rotate gear 67.2 forward to release the carriage lock mechanism. (Gear 67.2 is the largest gear on the left side of the printer. See Figure 4-6.) Then move the carriage to the center.
4. Push the timing belt tensioning mechanism inward to loosen the timing belt (see Figure 4-11), then remove the timing belt from the CR motor pulley.

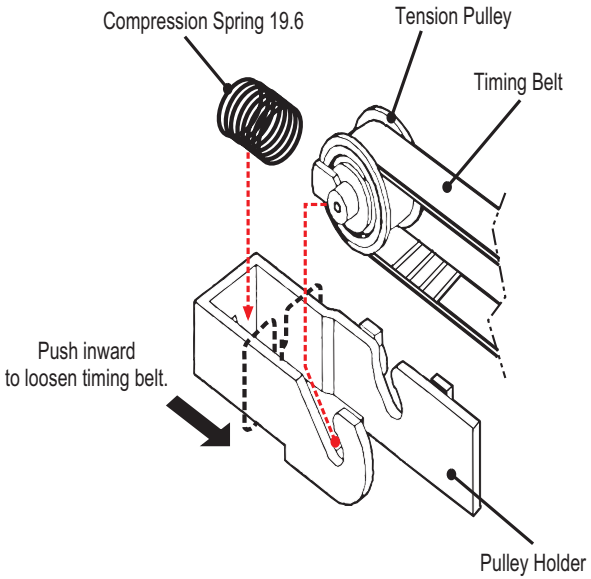


Figure 4-11. Timing Belt Tensioning Mechanism

5. Remove the board assembly (see Section 4.2.2). Then disconnect the CR motor connector from the main board (CN6 on the Stylus COLOR 440 and 640; CN7 on the Stylus COLOR 740).
6. Remove the 2 screws (No.1) securing the CR motor to the frame, and remove the CR motor.

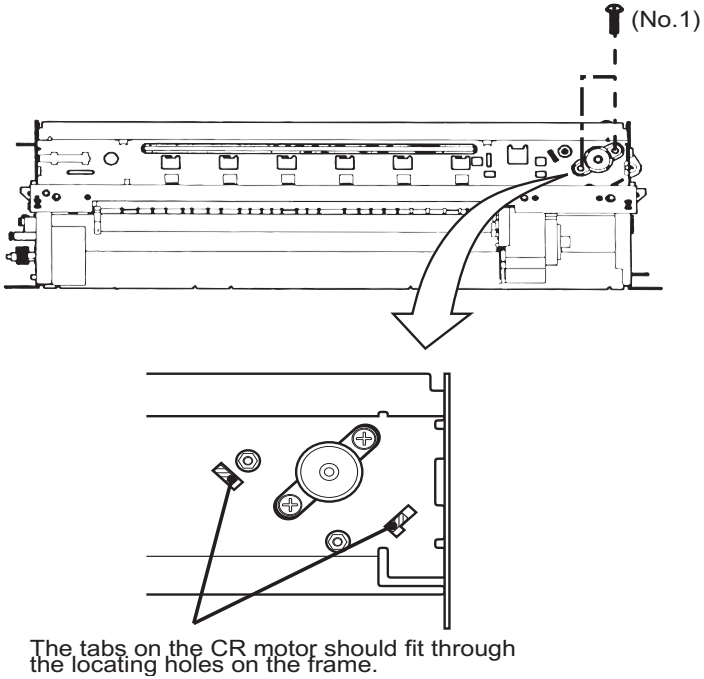


Figure 4-12. Positioning. the CR Motor Assembly

CHECK POINT

- **When installing the CR motor assembly, make sure that the two tabs on the motor bracket fit into the locating holes (slots) in the frame. (See Figure 4-12.)**
- **During reassembly, be sure to route the CR motor cable through the left cable hook and the right cable holder, as seen from the rear (see Figure 4-3).**

4.2.4.5 Removing the PF Motor

4.2.4.5.1 Stylus COLOR 740

NOTE: These instructions apply to the Stylus COLOR 740. See the next page for the 440 and 640.

1. Remove the housing. (Refer to Section 4.2.1.)
2. Remove the left front panel. (Refer to Section 4.2.3.)
3. Remove the waste ink pad assembly. (Refer to Section 4.2.4.2.)
4. Remove the board assembly (see Section 4.2.2). Then disconnect the PF motor connector (CN8) from the main board.
5. Remove the following gears located on the left side of the printer mechanism:
   - Gear 67.2 (Remove the ring with tweezers or a flathead screwdriver. Do not reuse this gear; see the caution note below.)
   - Combination gear 8.8,21.6
   - Combination gear 8,14.4
   - Gear 36
6. Remove the 2 hexagon nuts that secure the PF motor to the frame. Slide the PF motor toward the front of the printer so that the motor's pinion gear aligns with the larger hole in the frame, and remove the PF motor. (See Figure 4-13.)

CHECK POINT

During reassembly, be sure to route the PF motor cable through the right cable hook and the right cable holder, as seen from the rear (see Figure 4-3).

CAUTION

- **Handle all the gears carefully, as you would a bearing surface; do not damage or mar the teeth and grooves of the gears.**
- **Gear 67.2 cannot be pulled off its shaft without deforming it very slightly. If you reinstall the same gear, its deformation will cause poor print quality in Microweave mode. Therefore, always replace gear 67.2, even if it has no obvious or visible signs of damage.**

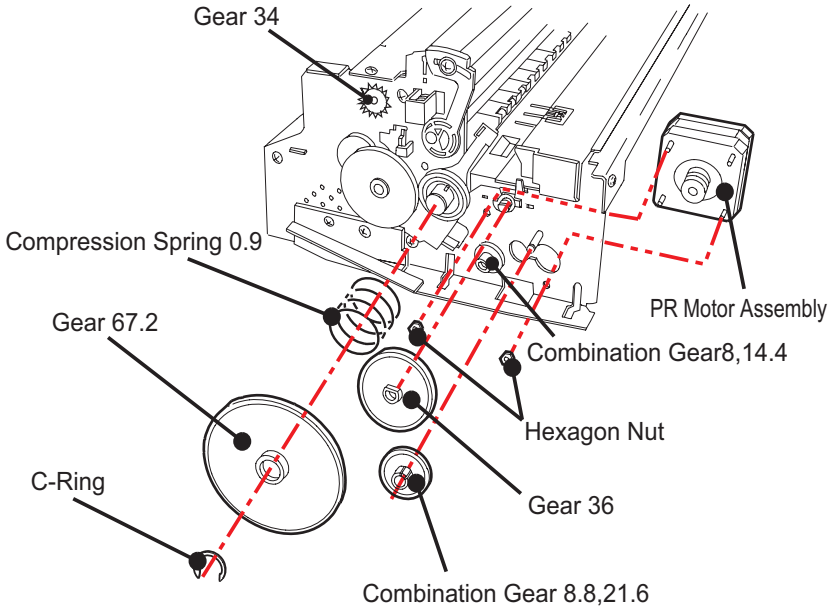


Figure 4-13.
Removing the PF Motor Assembly (Stylus Color 740)

4.2.4.5.2 Stylus COLOR 440 and 640

NOTE: These instructions apply to the Stylus COLOR 440 and 640. See the previous page for the 740.

1. Remove the housing. (Refer to Section 4.2.1.)
2. Remove the left front panel. (Refer to Section 4.2.3.)
3. Remove the waste ink pad assembly. (Refer to Section 4.2.4.2.)
4. Remove the board assembly (see Section 4.2.2). Then disconnect the PF motor connector (CN7) from the main board.
5. Remove the 2 screws securing the PF motor to the frame. (See Figure 4-14.) Slide the PF motor toward the front of the printer so that the motor's pinion gear aligns with the larger hole in the frame, and remove the PF motor. (See Figure 4-13.)

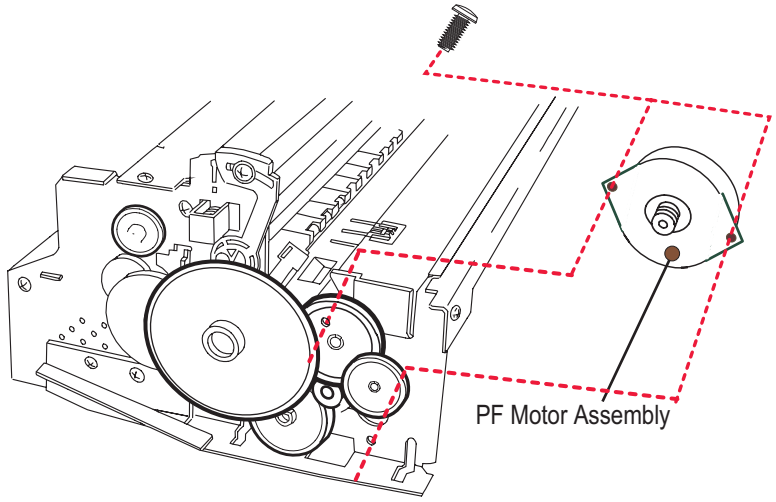


Figure 4-14. Removing the PF Motor Assembly (Stylus COLOR 440, 640)

CAUTION

Handle all the gears carefully, as you would a bearing surface; do not damage or mar the teeth and grooves of the gears.

CHECK POINT

During reassembly, be sure to route the PF motor cable through the right cable hook and the right cable holder, as seen from the rear (see Figure 4-3).

4.2.4.6 Removing the ASF Assembly

1. Remove the housing. (Refer to Section 4.2.1.)
2. Remove the board assembly (see Section 4.2.2). Then disconnect the ASF sensor from the main board (CN11 on the Stylus COLOR 440 and 640; CN6 on the Stylus COLOR 740).
3. Remove the 3 screws (No.1) from the PH cable guide plate. (See Figure 4-20.) Slide the plate toward the left side of the printer to unhook it from the frame. Without detaching the cables or kinking them, set the guide plate to the side of the printer mechanism.
4. Remove gear 34 from the ASF assembly. (See Figure 4-15.) To remove the gear, turn it so that the two black hooks holding it on the inner shaft become visible. Gently pry the hooks outward from the shaft with tweezers while pulling on the gear to remove it.
5. Remove the PF motor cable from the hook on the side of the ASF assembly.
6. Remove the 2 screws that hold the ASF in place (1 No.7 screw with a washer and 1 CR shaft installation screw). Remove the ASF assembly by lifting it upward.

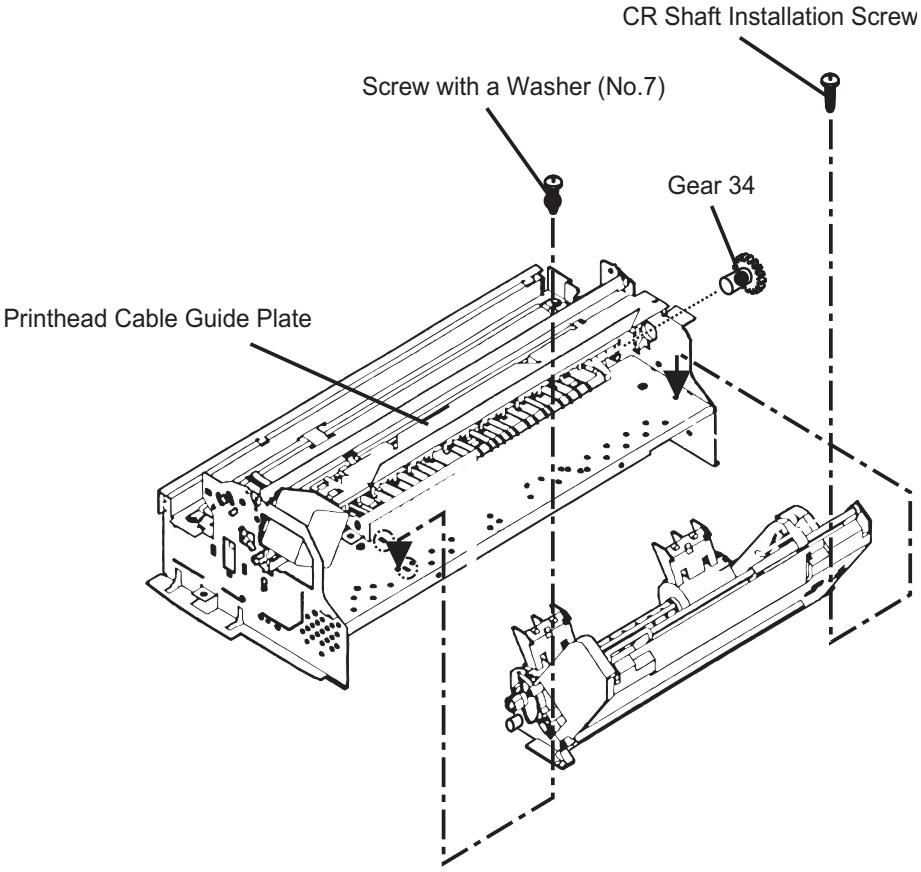


Figure 4-15. Removing the ASF Assembly

CHECK POINT

- **When installing the ASF assembly, make sure that the ASF assembly is properly seated on the frame, without any space between the ASF and the frame.**
- **During reassembly, be sure to route the ASF sensor cable through the right cable hook and the right cable holder, as seen from the rear (see Figure 4-3).**

4.2.4.6.1 Disassembling the ASF

1. Remove the ASF assembly. (Refer to Section 4.2.4.6.)
2. Remove the brake lever, releasing one arm of the torsion spring 41.2 from the hook of the ASF frame. See Figure 4-16.
3. Remove the shaft fixing clip from the right side of the ASF drive shaft. To release the clip, insert a small flathead screwdriver into one of the slots next to the locking tab on its side. Then gently pry the locking tab up and pull the clip loose from the ASF drive shaft.
4. Remove the right hopper release cam.
5. Grasping the blue paper guide, move the left ASF roller to the center of the ASF.
6. Remove the white plastic spacer clipped around the drive shaft next to the left hopper release cam.
7. Push the drive shaft to the left and remove the opto-interrupter wheel after releasing the hook that holds it in place on the shaft.
8. Disengage the hopper assembly from the 2 pins on which it pivots (left and right) at the top of the ASF frame.
9. Move the drive shaft all the way left, until it comes out of the hole in the right side of the ASF frame. (This should free the right roller assembly, which you should now be able to wiggle around.) Lift the right roller assembly so that the drive shaft is just visible over the top of the frame, and then free the shaft from the left side of the ASF by sliding it out to the right. Remove the shaft.

   (During reassembly, the compression spring on the right ASF roller should be compressed to enable the hopper latch (see Figure 4-16) to pass through the hole in the ASF frame.)
10. Remove the left hopper release cam.
11. Remove the hopper assembly together with the left and right ASF rollers.

During disassembly and assembly of the ASF, do not let grease on the cams touch any other parts. Wipe off any grease smeared on other parts.

- ❑ **The hopper release cams and the ASF rollers are keyed to prevent you from installing them on the drive shaft in the wrong direction.**
- ❑ **Test the shaft fixing clip and opto-interrupter wheel to make sure they're installed securely and don't slip off.**
- ❑ **Note that the black roller assembly goes on the right side and the lighter-colored one goes on the left.**

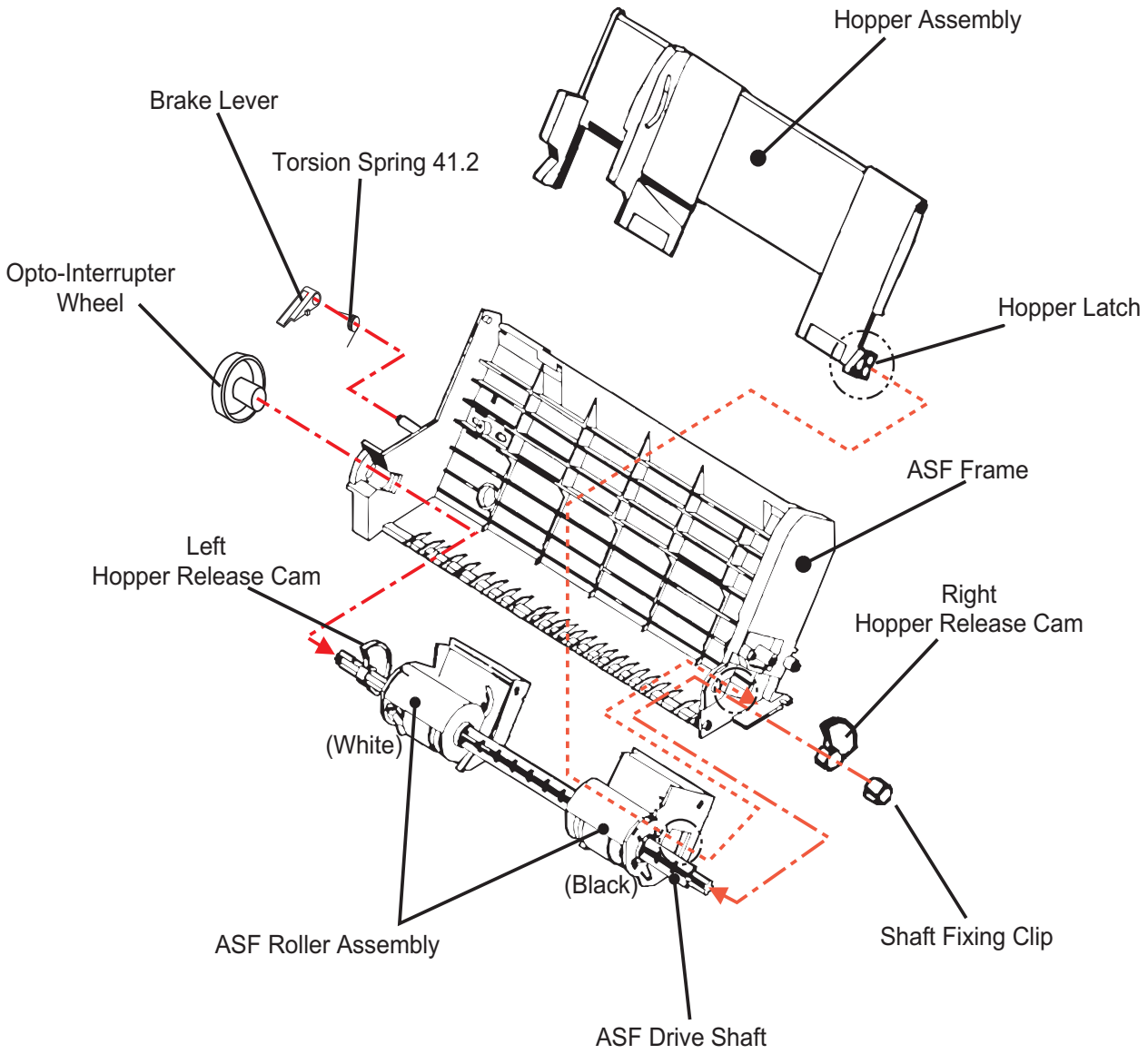


Figure 4-16. Disassembling the ASF

4.2.4.6.2 Disassembling the ASF Rollers

1. Disassemble the ASF and remove the ASF rollers and hopper from the ASF assembly. (Refer to Section 4.2.4.6.)
2. Take out the right and left compression springs 1.66 from the back of the hopper assembly.
3. Separate the roller assemblies from the hopper.
4. Carefully pull apart the roller frame and the roller cover.

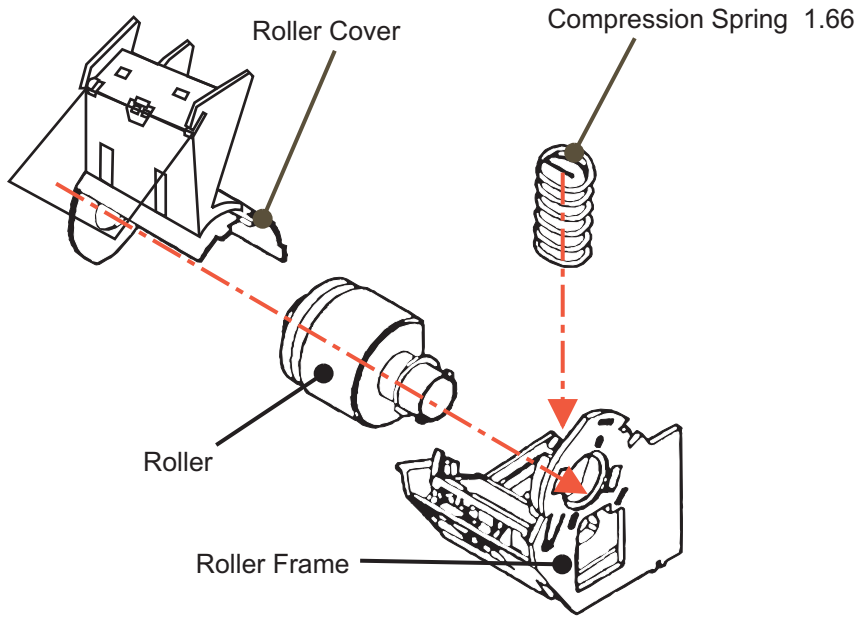


Figure 4-17. Disassembling the Paper Feed Rollers

4.2.4.7 Removing the Carriage Assembly

1. Remove the housing. (Refer to Section 4.2.1.)
2. Remove the ink cartridges and the printhead. (See Section 4.2.4.1.)
3. Loosen the timing belt by pushing the timing belt tensioning mechanism inward. (See Figure 4-11.) Then remove the timing belt from the CR motor.
4. Remove the timing belt tensioning mechanism by pushing it in far enough to enable you to slide it out through the notches in the frame.
5. Remove the torsion spring inserted between the frame and the PG lever. See Figure 4-18. Release the hooks holding the PG lever in place and remove the lever.
6. Gently pry up the hook built into the PG lever support, and remove the PG lever support and washer from the CR guide shaft. See Figure 4-19.
7. Remove the screw (No.7) fixing the right parallelism adjustment bushing. Rotate the bushing so that its tabs fit into the notches in the frame, and remove the bushing.
8. Remove the carriage with the CR guide shaft.

CAUTION

- **The washer should be installed with its convex side facing inward against the right parallelism adjustment bushing.**
- **During disassembly, the oil pad that lubricates the CR guide shaft may fall out of the carriage unit. Be sure to put it back during reassembly. See Figure 6-1.**

CHECK POINT

When disassembling the right parallelism adjustment bushing, mark its present position on the frame so that you can omit gap adjustment after assembly.

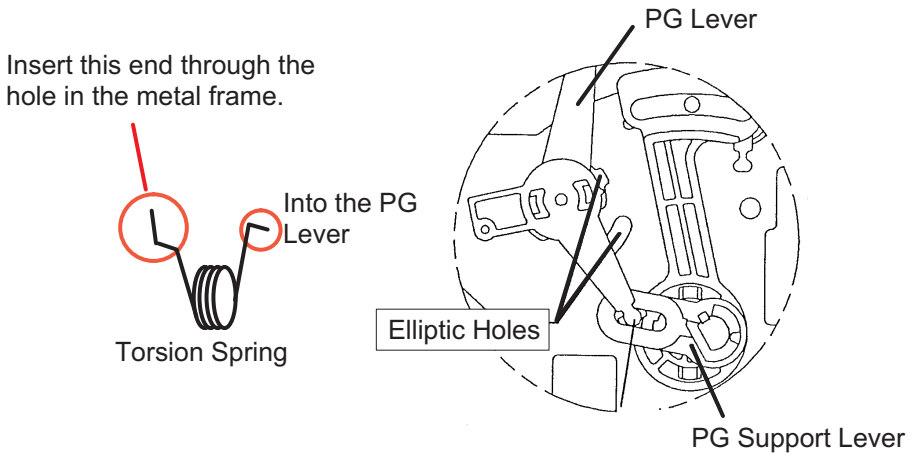


Figure 4-18. Installing the PG Lever

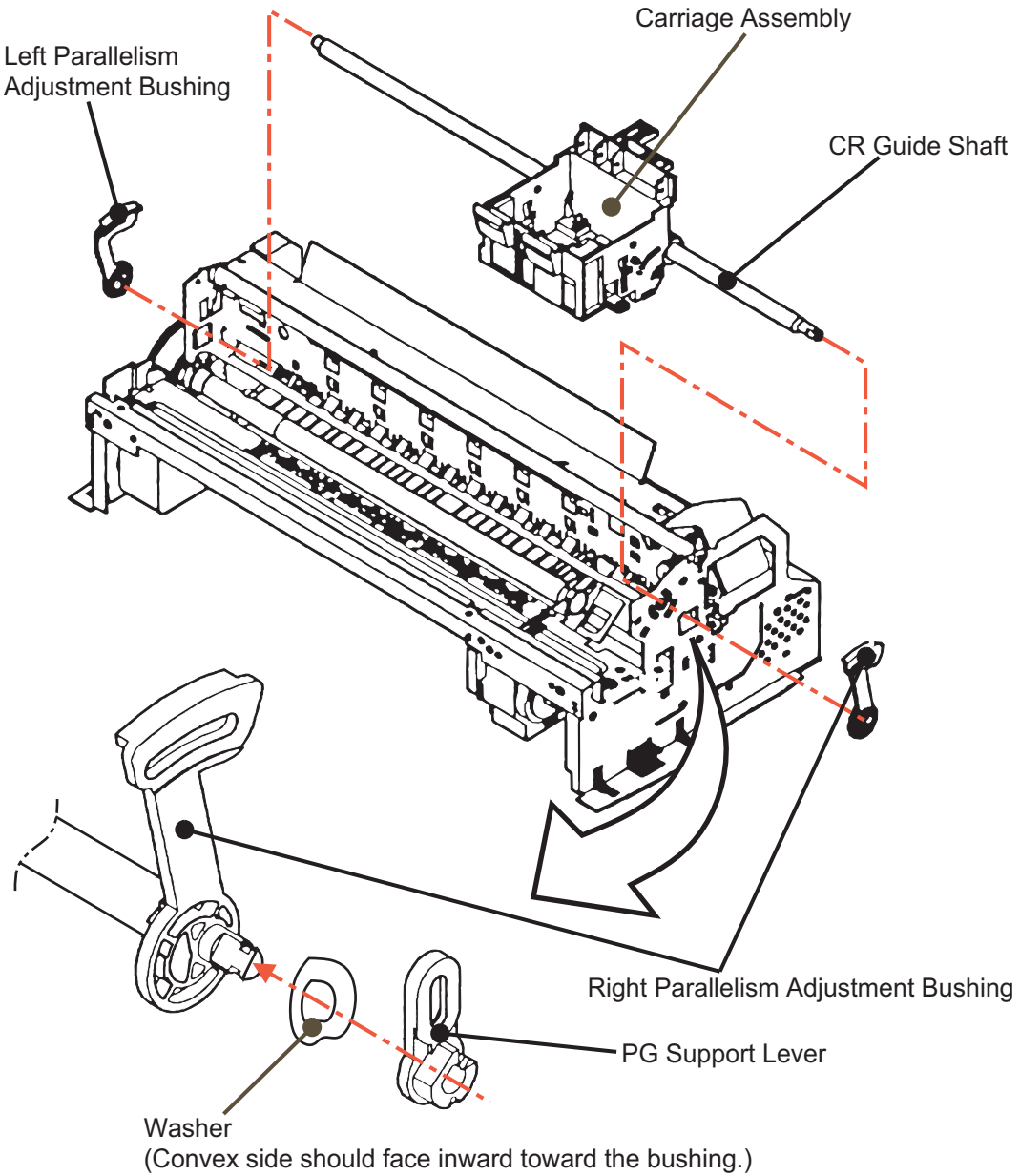


Figure 4-19. Removing the Carriage Assembly

4.2.4.8 Removing the Paper Feed and Paper Eject Roller Assemblies

1. Remove the housing. (Refer to Section 4.2.1.)
2. Remove the carriage assembly. (Refer to Section 4.2.4.7.)
3. Remove the 3 screws (No.1) that hold the cable guide plate in place, and remove the cable guide plate. See Figure 4-20.
4. Remove the 6 pinch rollers, releasing their springs from the hooks in the top frame.
5. Take out 2 screws (No.1) and remove the paper eject frame together with its star wheels (not shown).
6. Remove the platen by first lifting its left end, then lifting up the right. Then pull it out to the left. See Figure 4-21.
7. Remove the pump drive shaft, by pulling *inward* then *up* on the locking tabs located on the right and left ends of the shaft. See Figure 4-21.
8. Remove the PF roller (see Figure 4-22) by pulling out on the locking tab located on the left side of the PF roller. Then rotate the tab so that the other tabs align with the notches in the frame. Slide the PF roller assembly to the right and pull it out.

CAUTION

- **The PE sensor lever fits through the right-most pinch roller assembly. Be careful not to damage the lever when removing or installing the pinch roller.**
- **Be careful not to damage the hooks on the platen.**
- **Be careful not to scratch the PF roller, since its surface is specially coated to improve paper feeding.**
- **Be careful not to damage the combination gears.**

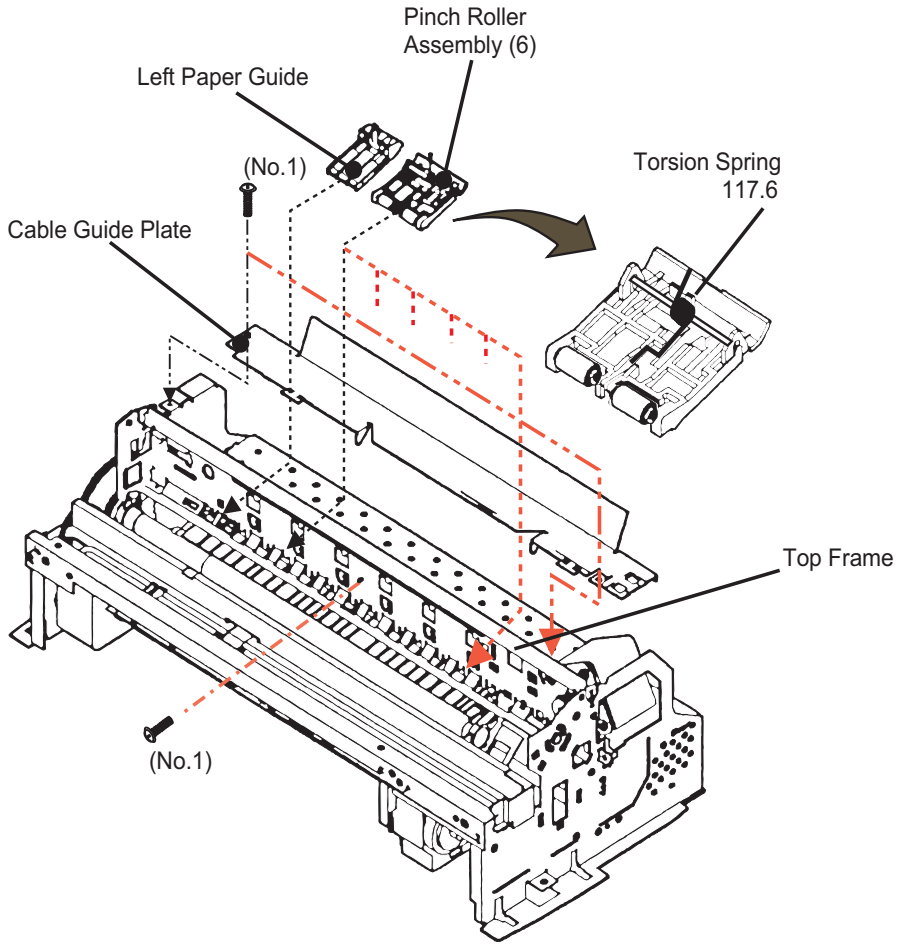


Figure 4-20. Removing the Paper Guide Assembly

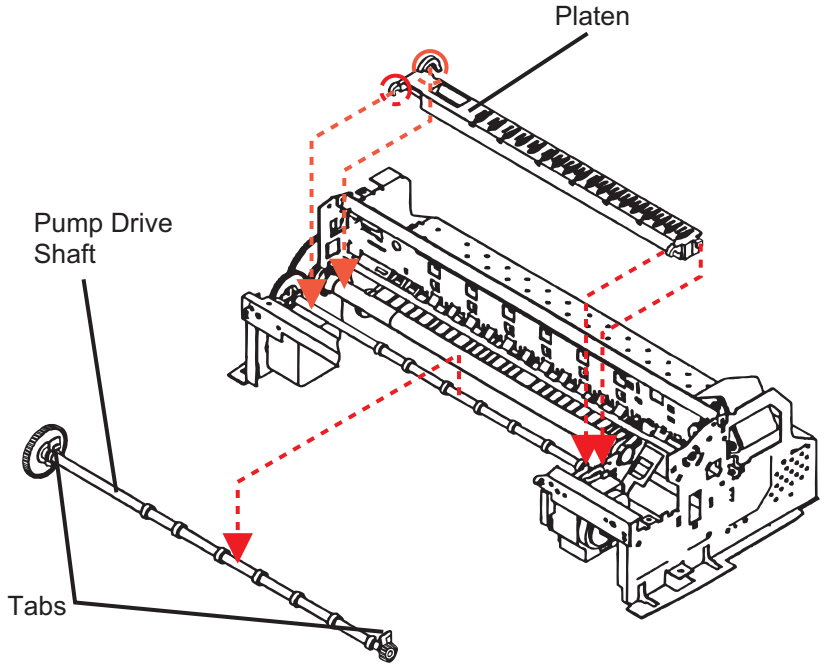


Figure 4-21. Removing the Platen and Pump Motor Drive Shaft

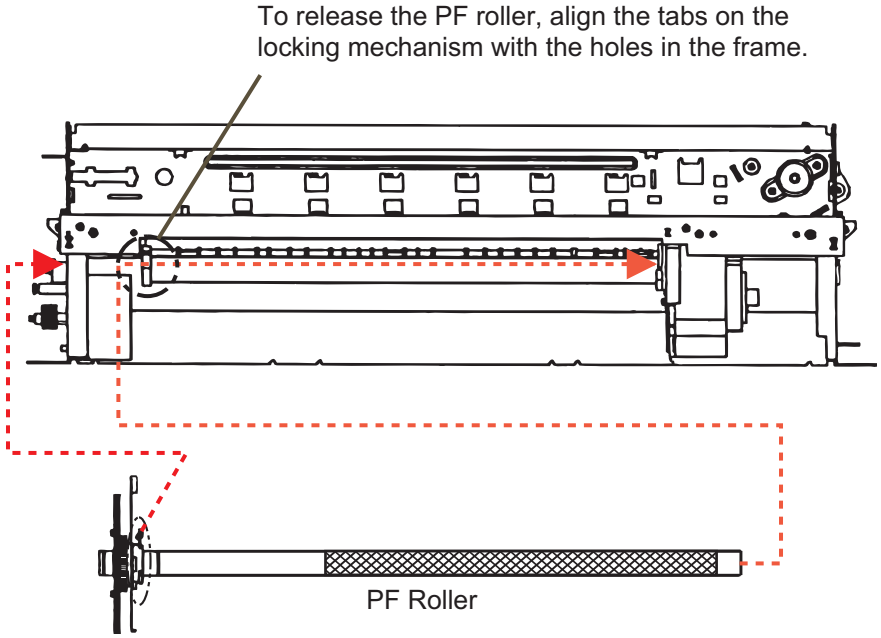


Figure 4-22. Removing the PF Roller

4.2.4.9 Removing the PE Sensor

1. Remove the housing. (Refer to Section 4.2.1.)
2. Release the 2 hooks securing the PE sensor support to the frame. Then remove the support by sliding it upward.
3. Remove the PE sensor and PE lever, if necessary.

CHECK POINT

During assembly, make sure that the tip of the sensor lever fits through the hole of the right-most pinch roller.

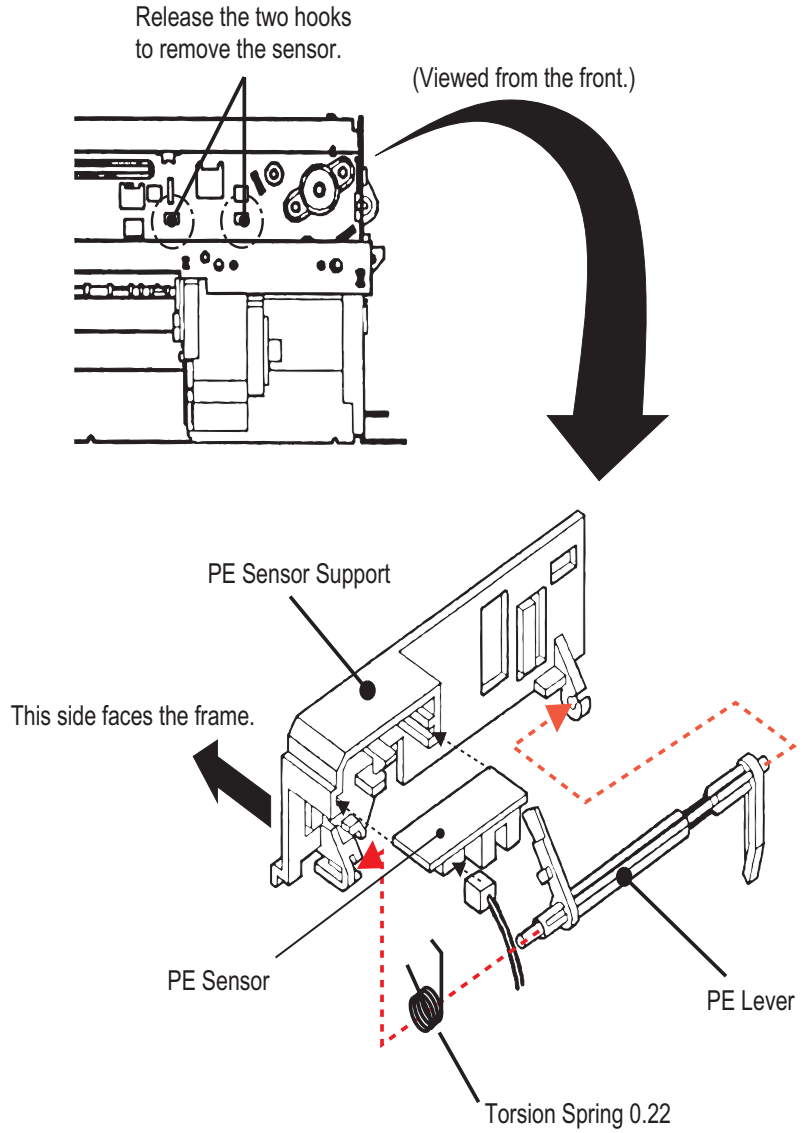


Figure 4-23. Removing the PE Sensor

4.2.4.10 Removing the HP Sensor

1. Remove the housing. (Refer to Section 4.2.1.)

2. Remove the HP sensor by releasing the hooks underneath it.

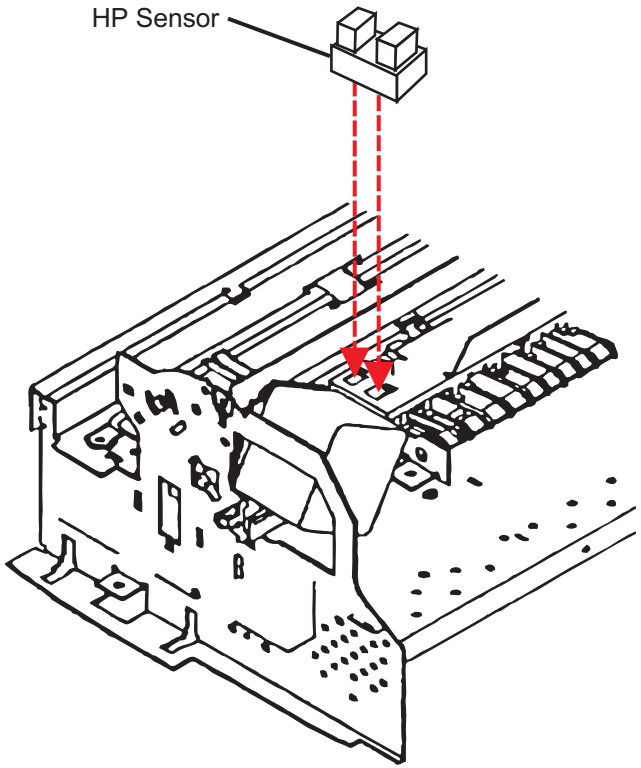


Figure 4-24. Removing the HP Sensor

CHAPTER

5

ADJUSTMENTS

5.1 Overview

The EPSON Stylus COLOR 440, 640, and 740 require certain adjustments to be performed after repairing or disassembling the printer. Table 5-1 tells you which adjustments you must perform following a given repair. You should follow the order of adjustments as listed in the table. Table 5-2 provides the same information, but arranged according to the type of adjustment.

Table 5-1 Required Adjustments

Type of Repair	Required Adjustments
Removal of the printhead	1. Perform initial ink charge. 2. Perform printhead angle adjustment. 3. Perform bi-d adjustment.
Replacement of the printhead	1. Perform head voltage ID input. 2. Perform initial ink charge. 3. Perform printhead angle adjustment. 4. Perform bi-d adjustment.
Replacement of the main board	1. Perform head voltage ID input. 2. Perform bi-d adjustment. 3. Perform CG table setting (only for Stylus COLOR 740).
Replacement or removal of the carriage unit	1. Perform parallel adjustment. 2. Perform printhead angle adjustment. 3. Perform bi-d adjustment.
Replace of the CR motor	1. Perform bi-d adjustment.
Replacement of the printer mechanism	1. Perform head voltage ID Input. 2. Perform initial ink charge. 3. Perform bi-d adjustment.

Table 5-2 Types of Adjustments

Adjustment	When Performed
Parallelism adjustment	• After removing or replacing the carriage guide shaft • After changing the setting of the parallelism adjustment bushing(s)
Initial ink charge	• After removing or replacing the printhead
Head voltage ID input	• After replacing the printhead • After replacing the main board ***Note:*** *The head voltage ID is not erased by the EEPROM reset operation.*
Printhead angle adjustment	• After removing or replacing the printhead • After moving the printhead angle adjusting lever
Bi-d adjustment	• After removing or replacing the printhead • After removing or replacing the carriage unit • After replacing the CR motor • After replacing the main board

5.1.1 Adjustment Tools Required

Table 5-3 below shows the adjustment tools required for servicing the EPSON Stylus COLOR 440, 640, and 740.

Table 5-3 Adjustment Tools Required

Tool	Type of Adjustment	Specification
Thickness gauge	Parallelism adjustment	1.04 mm
Adjustment program	• Initial ink charge • Head voltage ID input • Printhead angle adjustment • Bi-d adjustment	See "Choosing the Correct Adjustment Program" below.

5.1.1.1 Choosing the Correct Adjustment Program

When using the adjustment software, you must choose the correct program based on the printer's model name, PROM version, and logic board (for the Stylus COLOR 440 only). For each printer, there are two versions of the adjustment program: an "a" version and a "b" version. The tables below show which version to use.

Table 5-4 Adjustment Programs for the Stylus Color 440

Main Logic Board	PROM Version	Program Name
C206 Main-B	KA**** or older (PROM name TEA00A, TEA00B, TEA00C)	SC44011a.EXE
	KC**** or newer (PROM name TEA01A)	SC44011b.EXE
C206 Main	KB**** or older (PROM name TEA00D)	SC44011a.EXE
	KD**** or newer (PROM name TEA01B)	SC44011b.EXE

Table 5-5 Adjustment Programs for the Stylus COLOR 640

PROM Version	Program Name
OA**** or older (PROM name TDZ00A, TDZ00B)	SC64011a.EXE
OB**** or newer (PROM name TDZ00C)	SC64011b.EXE

Table 5-6 Adjustment Programs for the Stylus COLOR 740

PROM Version	Program Name
W0**** or older (PROM name TDV00B, TDV01B)	SC74011a.EXE
W1**** or newer	SC74011b.EXE

NOTE: *If the adjustment program you are using stalls, reports that the market destination is unknown, or exhibits other unusual symptoms, you may be using the wrong version. Exit the program, turn the printer off and then back on, and try using the other version.*

5.2 Adjustments

The sections below provide specific instructions for each type of adjustment.

5.2.1 Parallelism Adjustment

You must perform the parallelism adjustment after replacing or removing the carriage guide shaft, or if you change the setting of the parallelism adjustment bushings. This adjustment sets the standard distance from the printhead to the paper surface.

CAUTION

- **Do not scratch the ribbed surface of the platen or the special coating on the PF roller.**
- **To avoid damaging the printhead, never use a rusty, dirty, or bent thickness gauge. Clean the gauge before using it, and avoid pressing it hard against the head.**

1. Set the right and left parallelism adjustment bushings to the center position mark. This is where the ridge on the top of each bushing aligns with the notch and the screw hole on the metal frame. See Figure 5-2.

Right Parallelism Adjustment

2. Set the PG lever to 0 (forward). This minimizes the gap between the printhead and the platen.

3. Move the carriage to the center of the platen. Then set the thickness gauge on the right side of the platen as shown in Figure 5-1 on the next page.

4. Move the carriage so it's over the thickness gauge.

CAUTION

- **Put the thickness gauge on the flat part of the platen ribs, as shown in Figure 5-1.**
- **Move the carriage by pulling it with the timing belt.**

5. Move the right parallelism adjustment bushing to the rear, which narrows the gap, until the thickness gauge moves with the carriage when you slide the carriage about 1 inch (20 mm) in either direction.

6. Move the adjustment bushing one notch forward to widen the gap.

7. Set the PG lever to 0 (small gap) and slide the carriage right and left to make sure that the thickness gauge doesn't move with the carriage.

Left Parallelism Adjustment

8. Perform steps 2 through 7 to adjust the left parallelism adjustment bushing. But this time set the thickness gauge on the left side of the platen (see Figure 5-1).

Checking parallelism

9. Perform steps 2 through 4 again, with the thickness gauge set on the right side of the platen.

10. Make sure that the thickness gauge does not move along with the carriage when the carriage is moved about 1 inch (20 mm) in either direction.

11. Move the right parallelism adjustment bushing one notch to the rear (the gap will be narrowed). Then check that the thickness gauge moves along with the carriage. If the thickness gauge does not move, go back to step 2 and repeat the adjustment.

12. If the gap is adjusted correctly, move the right parallelism adjustment bushing one notch toward you (the gap will be wider).

Fixing the Parallelism Adjustment Bushing

13. Fix the right and left parallelism adjustment bushings with No.1 screws.

After completing this adjustment, check to make sure the printhead makes proper contact with the head cleaner blade, as described below.

1. Extend the cleaner blade by rotating gear 67.2. (This is the large gear on the left side of the printer. See Figure 4-6.)

2. Move the carriage so it's next to the cleaner blade, and make sure the overlap between the printhead and the cleaner blade is at least 1/16 inch (0.5 mm). If not, adjust or replace the blade. See Figure 5-3.

3. Retract the cleaner blade by rotating gear 67.2, and return the carriage to its home position.

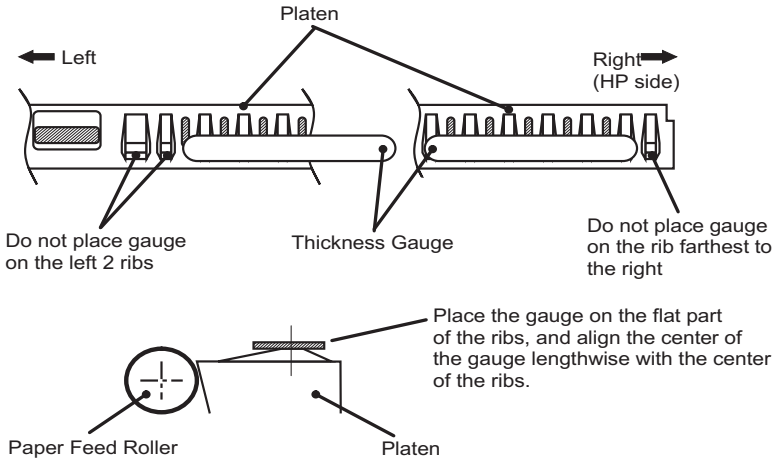


Figure 5-1. Gauge Placement

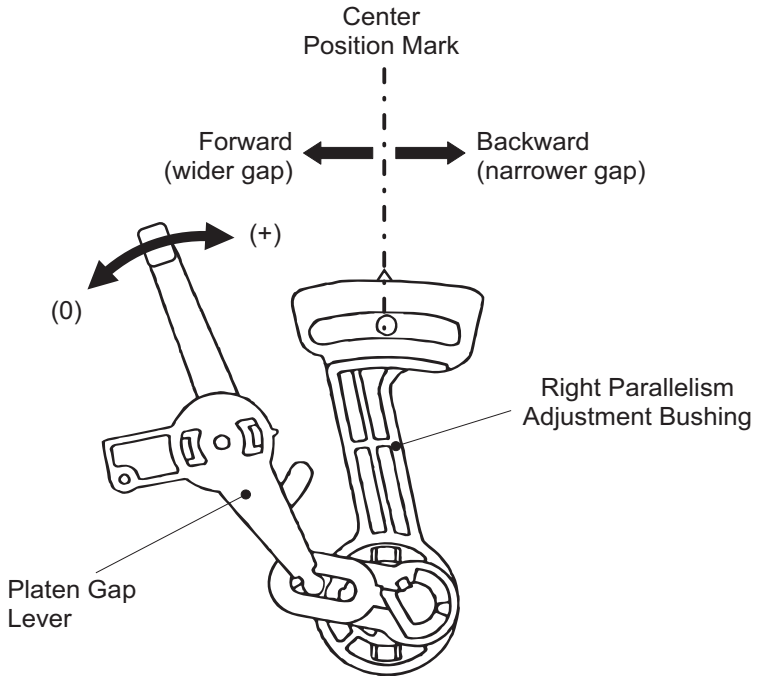


Figure 5-2. Parallelism Adjustment Bushing

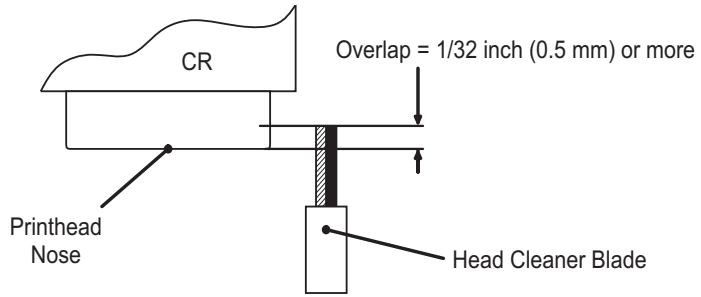


Figure 5-3. Contact Between Printhead and Cleaner Blade

5.2.2 Using the Adjustment Program

The adjustment program lets you set various values to compensate for component manufacturing variations. It also lets you ensure that parts are properly adjusted after completing repairs.

5.2.2.1 Operating Environment

For the adjustment program to run properly, your computer must be configured as described below. Reboot the PC after making any changes to enable the new settings.

- ❑ Use MS-DOS version 6.2 or higher.
- ❑ Start the adjustment program only after booting to DOS, as the program does not operate in a DOS window within the Windows environment.
- ❑ Use only LPT1 as the printer port.
- ❑ Check the contents of your CONFIG.SYS file, and add the following command line if it's not already present:

  Device=c:\<path name>\ansi.sys or
  Devicehigh=c:\<path name>\ansi.sys

  The device driver *ansi.sys* enables escape sequence characters to display properly on the screen. Replace **<path name>** with the path of the directory containing your ansi.sys file. (If you're not sure where the ansi.sys file is located, you can use the Find tool in Windows Explorer to locate it.)

- ❑ Check the contents of your AUTOEXEC.BAT file, and add the following command line if it's not already present:

  Mode lpt1:retry=p

  This command resends failed transmissions of raster data, and defines the numbers of retries to the printer port as *permanent.*

5.2.2.2 Starting the Adjustment Program

1. Connect the printer to the host PC, and turn on the printer.
2. Insert the disk containing the correct adjustment program. See "Choosing the Correct Adjustment Program" for more information.
3. Start the program by typing its name at the DOS prompt. The following screen should appear.

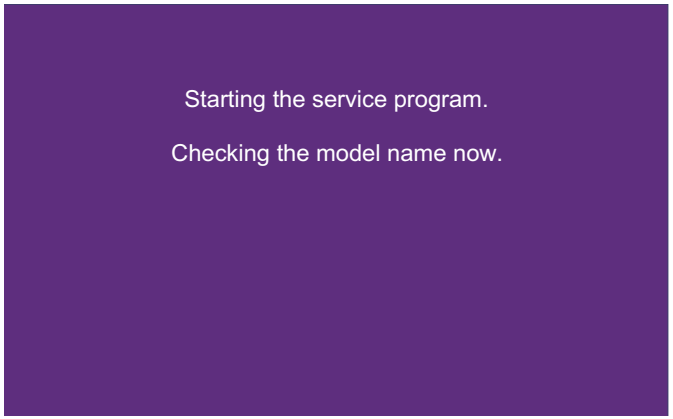


Figure 5-4. Initial Screen

5.2.2.3 Entering the Main Menu

Before performing any adjustment, you first need to take certain steps to get to the main menu. The instructions below explain these steps. Some of the steps may be different, depending on the printer and its specific setup. The steps are also outlined in the flowchart at right.

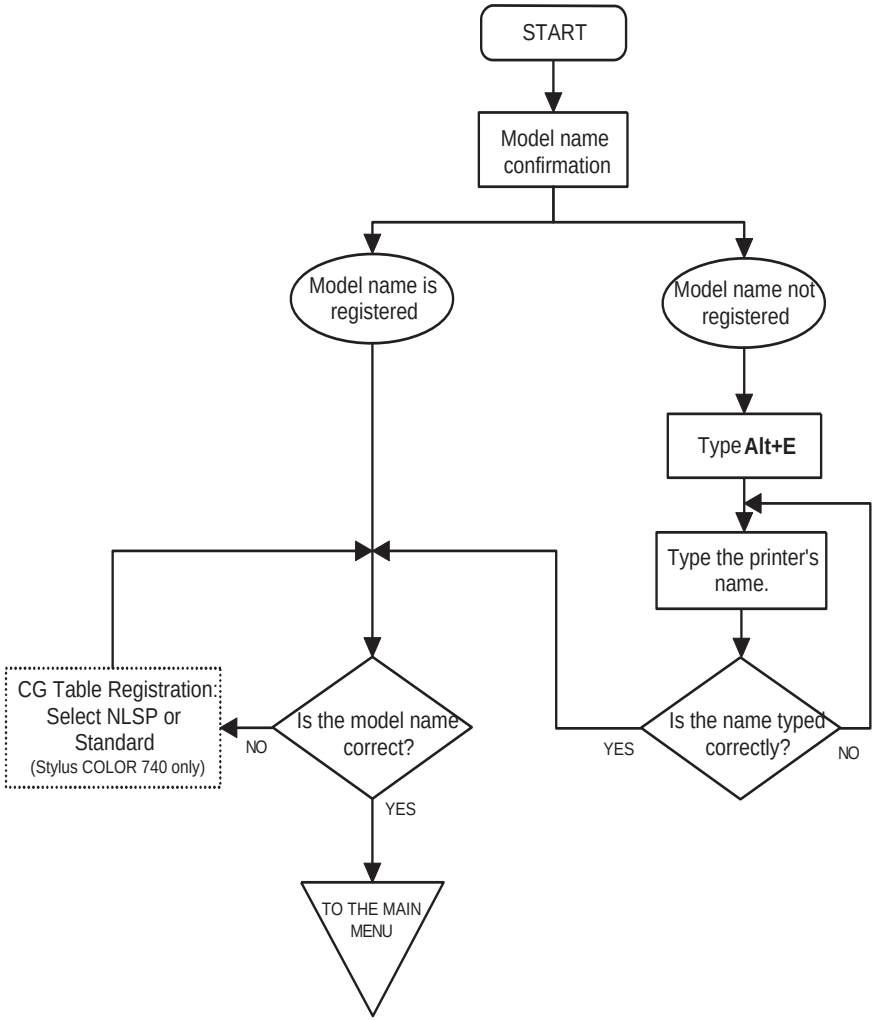


Figure 5-5. Entering the Main Menu

1. When you first start the adjustment program, it checks the printer's model name. If the model name is properly registered, the following screen appears:

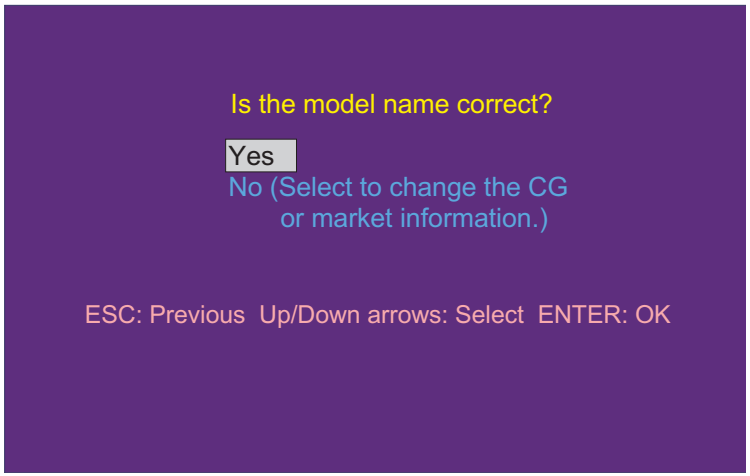


Figure 5-6. Model Name Confirmation

- **If the printer is a Stylus COLOR 440 or 640, select YES and continue to Step 2.**
- **If the printer is a Stylus COLOR 740, select NO and go to Section 5.2.2.3.2, "Selecting the CG Table."**
- **If the screen above does not appear, it means the model name is not registered. Go to Section 5.2.2.3.1, "Registering the Model Name."**

2. After you confirm the printer's model name, the main menu screen appears, as shown below.

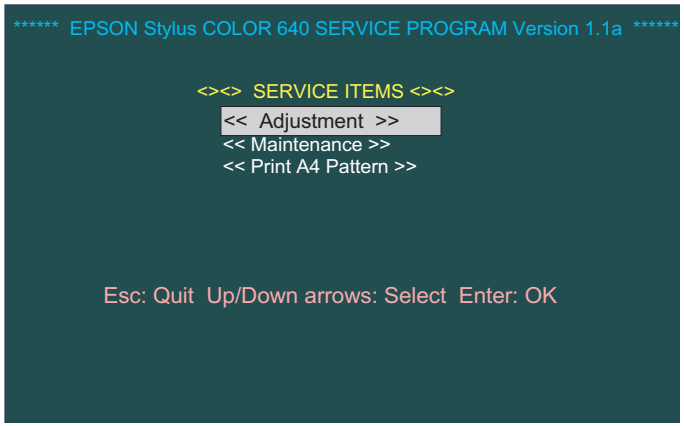


Figure 5-7. Main Menu

From the main menu, you can select adjustment and maintenance procedures as shown in Figure 5-8 below.

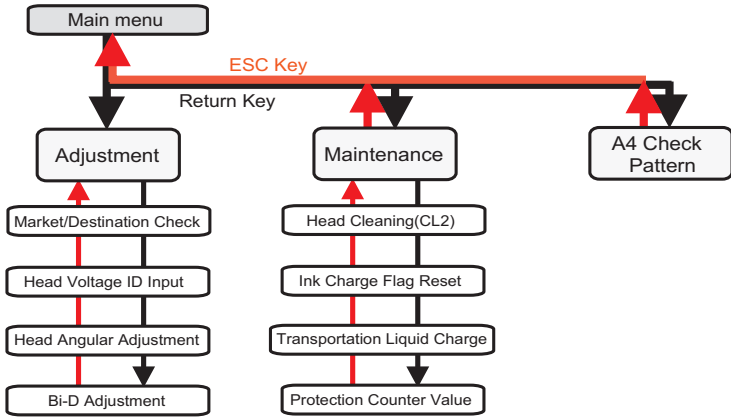


Figure 5-8. Menu Options

5.2.2.3.1 Registering the Model Name

1. If the model name is not registered, the screen shown below appears.

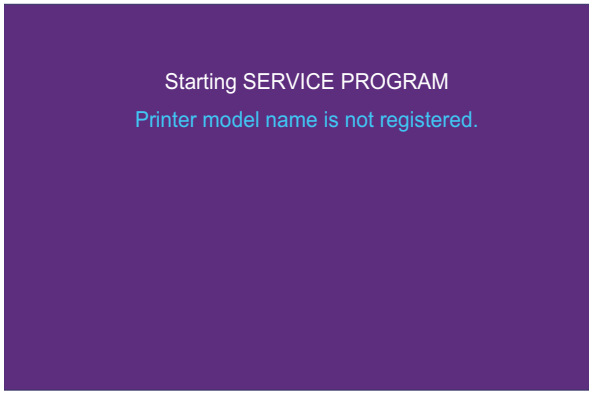


Figure 5-9. Model Name Not Registered

2. Press **Alt-E**. The model name input screen appears, as shown below.

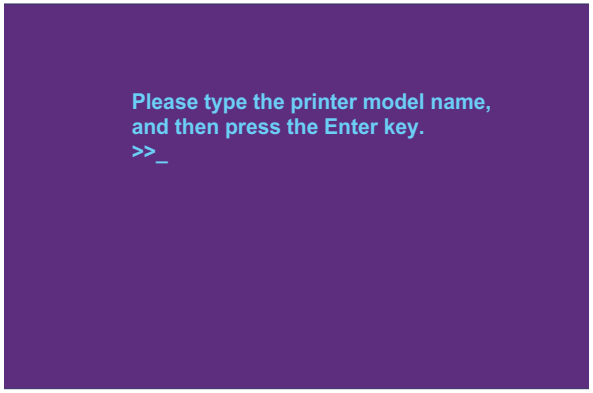


Figure 5-10. Model Name Input Screen

3. Type the correct model name, referring to the box below.

Stylus COLOR 440
Stylus COLOR 640
Stylus COLOR 740

CAUTION

- **Type the model name exactly as shown above, paying attention to spacing and capitalization.**
- **If you mistype the model name, the program will automatically return to the model name input screen (Figure 5-10).**

4. After a few seconds, the model name appears on the model name confirmation screen (Figure 5-6). Proceed to one of the steps below.

➡ **If the printer is a Stylus COLOR 440 or 640, go back to Step 1 of Section 5.2.2.3, "Entering the Main Menu."**

➡ **If the printer is a Stylus COLOR 740, select NO on the model name confirmation screen, and continue to Section 5.2.2.3.2 on the next page.**

5.2.2.3.2 Setting the CG Table

This section applies only to the Stylus COLOR 740.

There are two models for the Stylus Color 740: the standard model and the NLSP (world) model. Therefore, you must set the character generation (CG) table to NLSP or standard as described below.

1. After you've selected **NO** on the model name confirmation screen (Figure 5-6), the screen below appears.

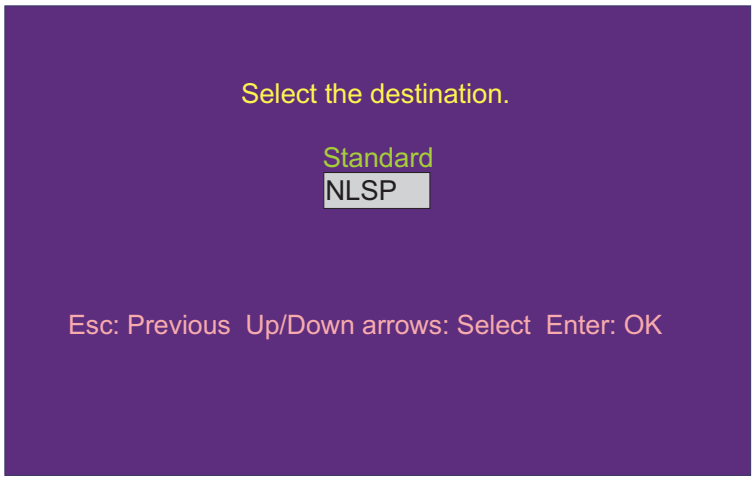


Figure 5-11. Destination Selection Screen (Stylus COLOR 740 only)

2. Perform one of the following:
   - If your Stylus COLOR 740 supports NLSP characters (see the caution note below), select **NLSP**.
   - If your Stylus COLOR 740 does not support NLSP characters, select **Standard**.

After a few seconds, the program automatically returns to the model name confirmation screen (Figure 5-7).

The CG table has been correctly set. Return to Step 1 of Section 5.2.2.3 to enter the main menu.

If the main board is a replacement board, its CG table has been set to Standard at the factory and may need to be changed to NLSP. However, you should not select NLSP if the new board does not support NLSP characters. You can distinguish the NLSP model from the Standard model by looking at the main board itself:

- **Standard: The space for IC6 is vacant on the main board.**
- **NLSP: IC6 is built into the main board.**

5.2.2.4 Initial Ink Charge

The initial ink charge ensures that the path from the ink cartridges to the nozzles is filled with ink. Normally, this operation is performed only when a printer is new. However, if you remove or replace the printhead, you must also perform an initial ink charge.

1. Enter the main menu. (Refer to Section 5.2.2.3.)

2. In the main menu (Figure 5-7), select **Maintenance**. The following screen appears.

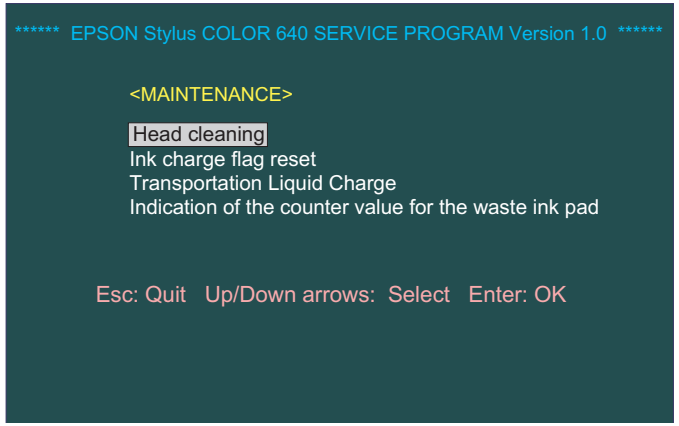


Figure 5-12. Maintenance Menu

3. Select **Ink charge flag reset.**

   The ink charge flag is an EEPROM register that the printer checks at power-on. If the ink charge flag is reset, it causes the printer to perform an initial ink charge the next time its power is turned on.

4. The confirmation screen shown below appears. Select **Yes** in answer to the question, "Do you want to reset the initial ink charge flag?"

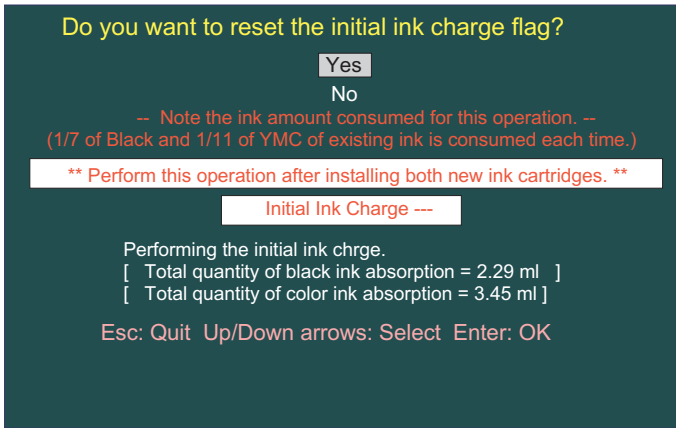


Figure 5-13. Initial Ink Charge Confirmation

CAUTION

Before performing the initial ink charge, replace the installed cartridges with new ones. This is because the amount of ink used for the initial charge operation is so great.

5. Turn off the printer for 10 seconds, and then turn it back on. The printer automatically performs the initial ink charge.

CAUTION

It takes about 90 seconds to complete the operation. Do not disturb the printer until the operation is complete.

5.2.2.5 Head Cleaning Operation

The head cleaning operation causes the printer to perform its strongest cleaning sequence, known as CL2. With this sequence, you can usually clear clogged nozzles.

NOTES:

- *If the CL2 cleaning sequence fails to clear the nozzles, perform the initial ink charge sequence as described in Section 5.2.2.4.*
- *Unlike their predecessors, the Stylus COLOR 440, 640, and 740 no longer use the dummy cleaning sequence CL3. This means you don't have to send a print job to the printer between cleaning operations to enable cleaning to take place.*

1. Enter the main menu. (Refer to Section 5.2.2.3.)
2. Select **Maintenance** in the main menu.
3. Select **Head cleaning**. The following screen appears.

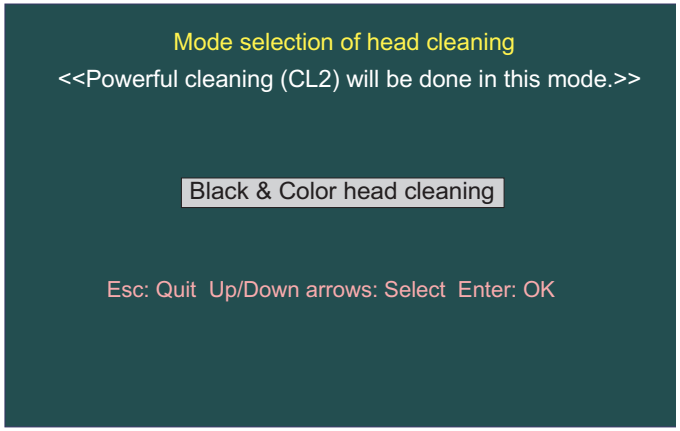


Figure 5-14. Cleaning Screen

4. When you press Enter, the printer activates the CL2 cleaning sequence.

CAUTION

The cleaning sequence takes about 60 seconds to complete. Do not disturb the printer until the operation is complete.

5.2.2.6 Protection Counter

The protection counter uses a point system to keep track of the amount of ink that has been absorbed by the waste ink pad. With the adjustment program, you can check the current value of the counter. You can also reset the counter to zero when you replace the pad.

NOTE: You can also check and reset the protection counter without connecting the printer to a host computer. When you print the nozzle check pattern, the printout shows you the current value of the protection counter. See Section 1.5.5. Also, Section 1.4.2 explains how to reset the protection counter from the printer's control panel.

Checking the protection counter's current value

1. Enter the main menu. (Refer to Section 5.2.2.3.)
2. Select **Maintenance** in the main menu.
3. Select **Indication of the counter value for the waste ink pad**. The screen shown in Figure 5-15 appears.

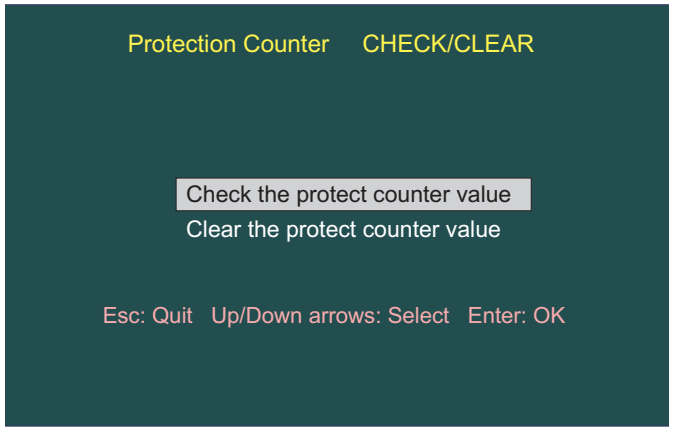


Figure 5-15. Protection Counter Menu

4. Select **Check the protect counter value**. The screen shown below indicates the current point value of the protection counter.

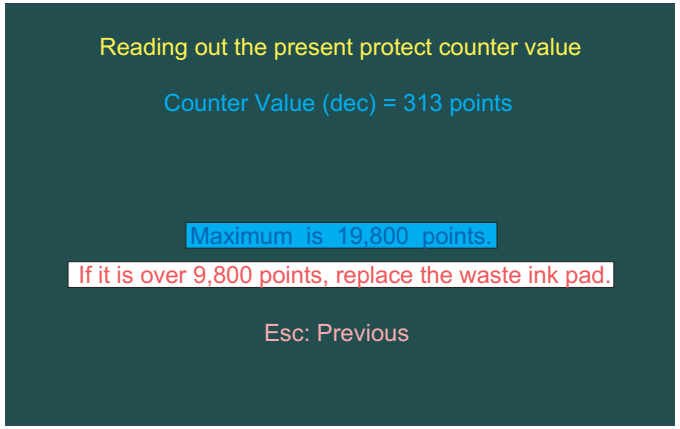


Figure 5-16. Protection Counter Readout Screen

Resetting the protection counter

1. Follow steps 1 through 3, above, to get to the protection counter menu screen.

2. Select **Clear the protect counter value**. The screen shown below appears. It reminds you to replace the waste ink pad when resetting the counter.

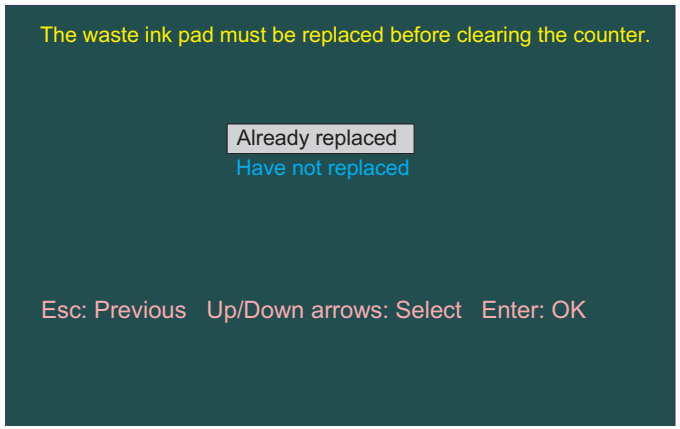


Figure 5-17. Protection Counter Confirmation Screen

3. Select **Already replaced**. The screen shown in Figuure 5-18 appears, indicating that the protection counter has been reset.

NOTE: If you select "Have not replaced," the adjustment program does not advance beyond the current screen (Figure 5-17).

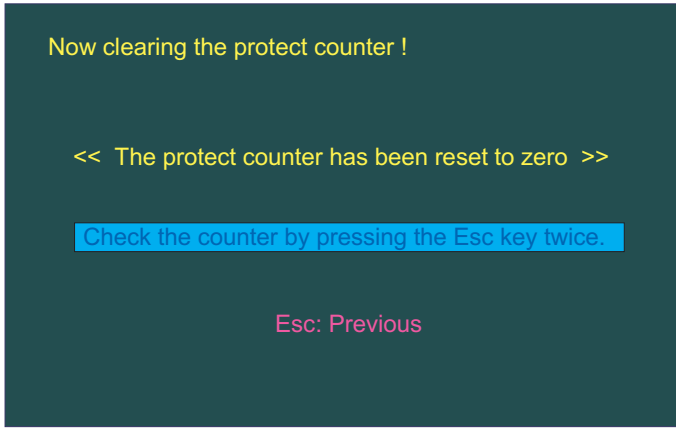


Figure 5-18. Resetting the Protection Counter

CAUTION

Be sure to replace the waste ink pad with a new one when you reset the protection counter.

5.2.2.7 Market Destination Check

NOTE: This section applies only to the Stylus COLOR 740.

After replacing the main board of the Stylus COLOR 740, you should make sure that the CG (character generation) table has been set correctly. (See Section 5.2.2.3.2.) The Market Destination Check enables you to confirm the CG table's setting.

1. Enter the main menu. (See Section 5.2.2.3.)
2. Select **Adjustment** in the main menu. The following screen appears.

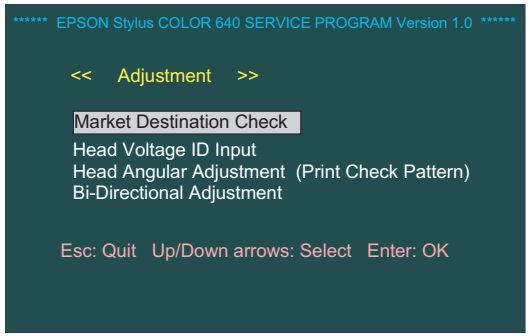


Figure 5-19. Adjustment Menu

3. Select **Market Destination Check**. The following screen appears.

Figure 5-20. Market Destination Checking Screen

4. Press Enter. The screen below appears, showing the current destination and CG settings. (The CG setting will be either NLSP or Standard.)

Figure 5-21. Market Destination Confirmation Menu

5. When done, you can return to the adjustment menu by pressing the Esc key twice.

5.2.2.8 Head Voltage ID Input

The head voltage ID is a numerical value stored in the printer's EEPROM. It corrects for manufacturing variations in the piezo-electric elements of the printhead. If the correct ID is not entered, the printer will be unable to print properly, and banding or blurred printing may result. You must enter the correct head voltage ID when:

- Replacing the main board
- Replacing the printhead
- Replacing the printer mechanism

1. When you replace any of the parts above, note the head voltage ID in advance. You can find the voltage ID in the following locations:
   - Printhead (440 and 640): On the side of the printhead.
   - Printhead (740): On the top of the printhead.
   - Printer mechanism: On the label on the packing box of the printer mechanism.
2. Enter the main menu. (See Section 5.2.2.3.)
3. Select **Adjustment** in the main menu.
4. Select **Head Voltage ID Input**. The following screen appears.

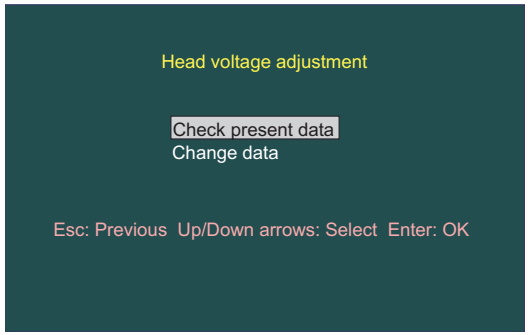


Figure 5-22. Head Voltage ID Menu Screen

5. Select **Change data**. The following screen appears, prompting you to enter the head voltage ID.

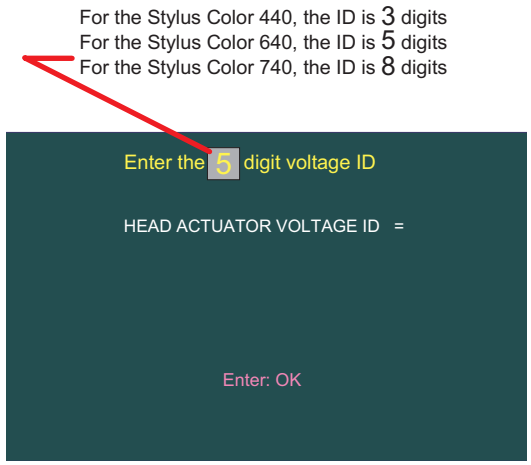


Figure 5-23. Head Voltage ID Input Screen

6. After you input the head ID, it takes about 5 seconds to store it in the EEPROM. After the value has been stored, the confirmation screen shown below appears:

Figure 5-24. Head Voltage ID Confirmation Screen

7. Press Esc once. The Head Voltage ID Menu screen reappears (Figure 5-22).

8. Select **Check present data**. The screen below appears, enabling you to check the value you just entered.

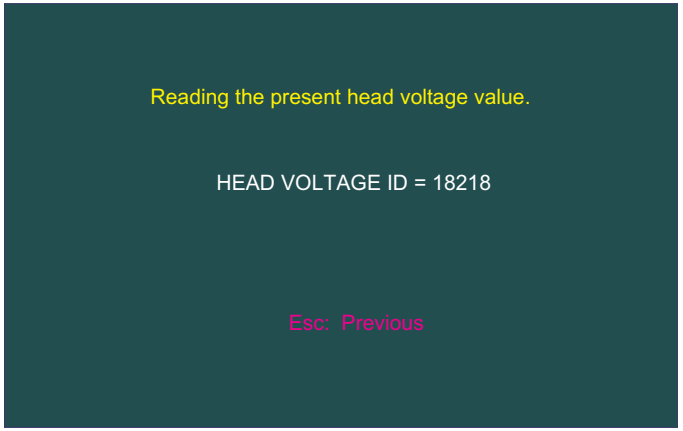


Figure 5-25. Checking the Head Voltage ID

5.2.2.9 Head Angle Adjustment

The head angle adjustment corrects for manufacturing variations in the shape of the carriage and the printhead. If this adjustment is not performed, banding may occur in the printed output. You must perform this adjustment in the following cases:

- After replacing the printhead
- After replacing the carriage unit
- If you have changed the angle of the adjustment lever

In order to perform the adjustment, you must first print the head angle check pattern as described below. Then use the adjustment lever, which is located on the right side of the carriage unit, to set the printhead angle accordingly.

CAUTION

- Before making this adjustment, refer to Table 5-1 and make any other required adjustments, following the order listed in the table.
- Use only high-quality (720 dpi) ink jet paper for printing the check pattern because of the high degree of precision required.

1. Remove the upper housing from the main unit. (See Section 4.2.1.)

NOTE: If you prefer, you can perform this adjustment without removing the upper case. When you need to access the carriage unit, select "Move the carriage to the head angular adjustment position" on the screen shown in Figure 5-26.

2. Enter the main menu (see Section 5.2.2.3). Then select **Adjustment**.

3. In the adjustment menu, select **Head Angular Adjustment**. The following screen appears.

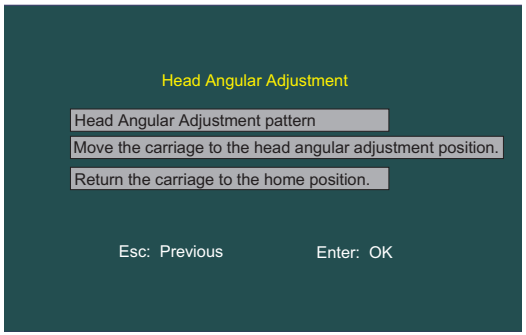


Figure 5-26. Head Angle Adjustment Menu

4. Select **Head Angular Adjustment Pattern** and press Enter. The following screen appears and the printer prints the head angle adjustment pattern (Figure 5-28 on the next page).

Figure 5-27. Printing the Head Angle Adjustment Pattern

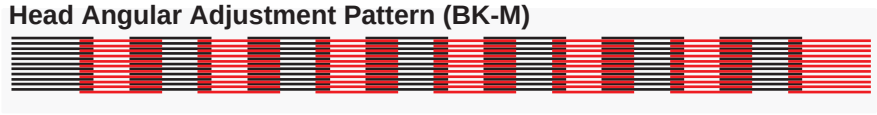


Figure 5-28. Sample of Head Angle Adjustment Pattern

5. Loosen the printhead securing screw that secures the printhead to the carriage. (You don't need to remove it completely.)

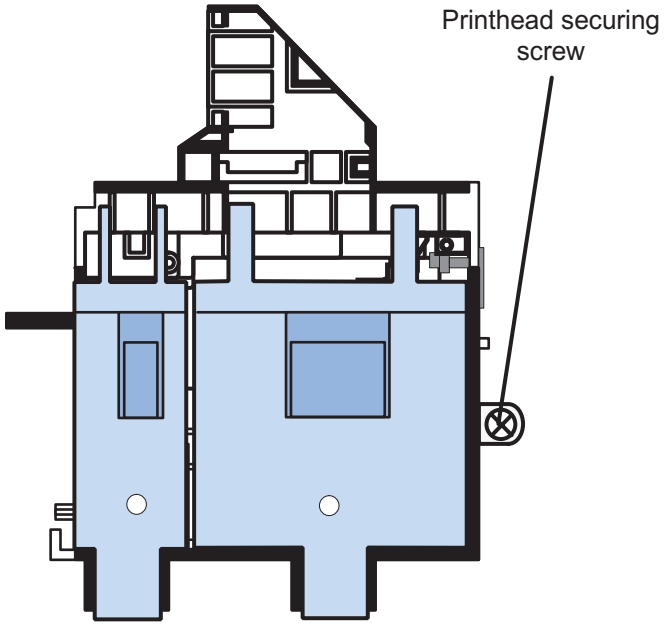


Figure 5-29. Screw Location

CAUTION

Be sure to loosen this screw. Otherwise, the printhead angle will not change even if you're able to move the adjusting lever.

6. Look at the overlapping area between the black lines and the magenta lines in the check pattern. Move the adjusting lever so that the black and magenta lines are evenly spaced, as shown in Figure 5-30 below.

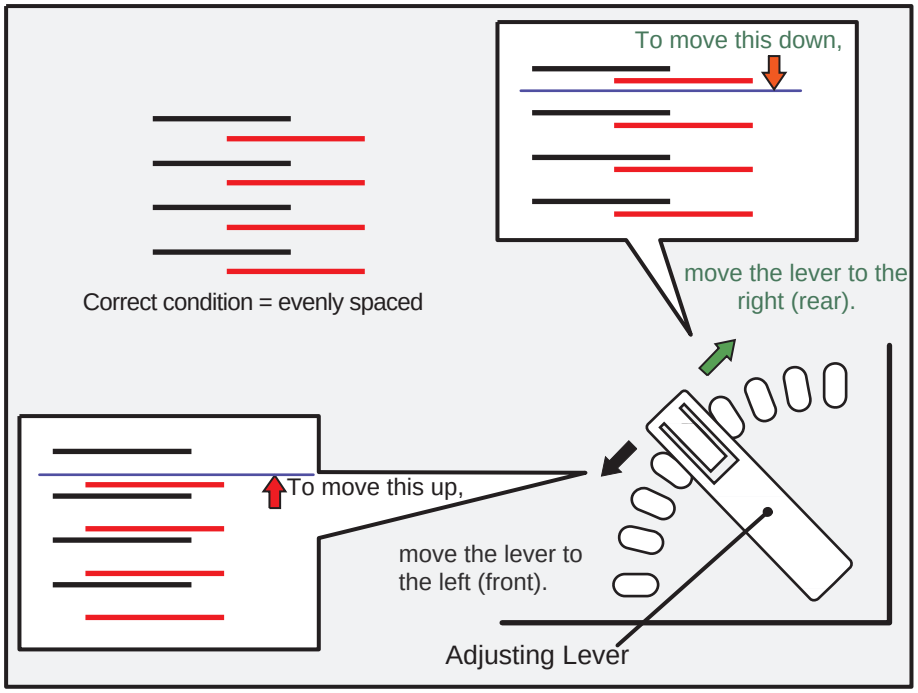


Figure 5-30.
Lever Operation and Corresponding Change in Pattern

NOTE: Because this adjustment requires a high degree of precision, you may wish to use a magnifying glass or an eye-loupe when viewing the check pattern.

7. After changing the position of the adjust lever, select **Head Angular Adjustment Pattern** again. The printer prints another check pattern.

8. Examine the pattern for the proper alignment.

9. Continue adjusting the printer, checking the alignment each time, until you have achieved the correct adjustment.

10. After completing the adjustment, tighten the printhead securing screw and reinstall the upper case if you have removed it.

5.2.2.10 Bi-D Adjustment

The bi-directional adjustment enables you to change a timing value that controls vertical alignment of the printed output in the bidirectional print mode. You must perform this adjustment after:

- Replacing the printer mechanism
- Replacing the main board
- Replacing the CR motor
- Removing or replacing the printhead
- Removing or replacing the carriage unit

1. Enter the main menu (see Section 5.2.2.3). Then select **Adjustment**.
2. In the adjustment menu, select **Bi-Directional Adjustment**. The following screen appears.

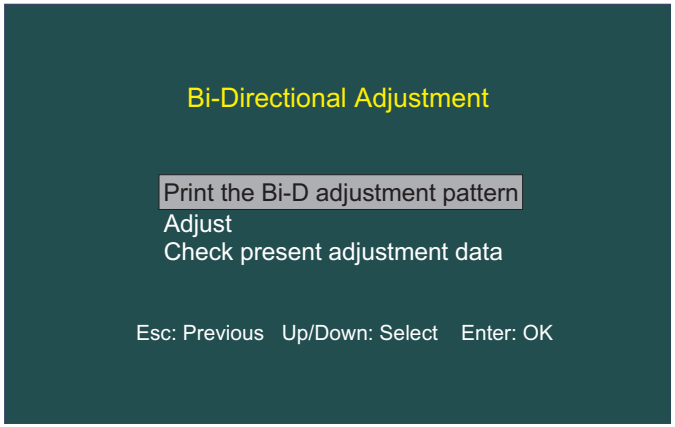


Figure 5-31. Bi-D Adjustment Menu

3. Select **Print the Bi-D adjustment pattern**. The following screen appears.

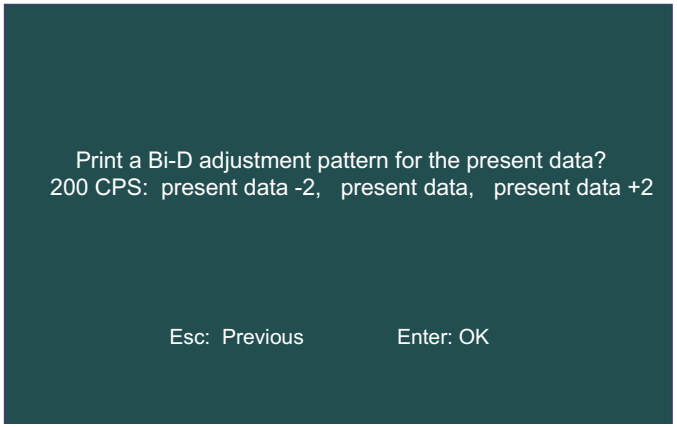


Figure 5-32. Before Printing the Bi-D pattern

4. When you press Enter, the printer starts printing a Bi-D adjustment pattern (see Figure 5-33 on the next page).

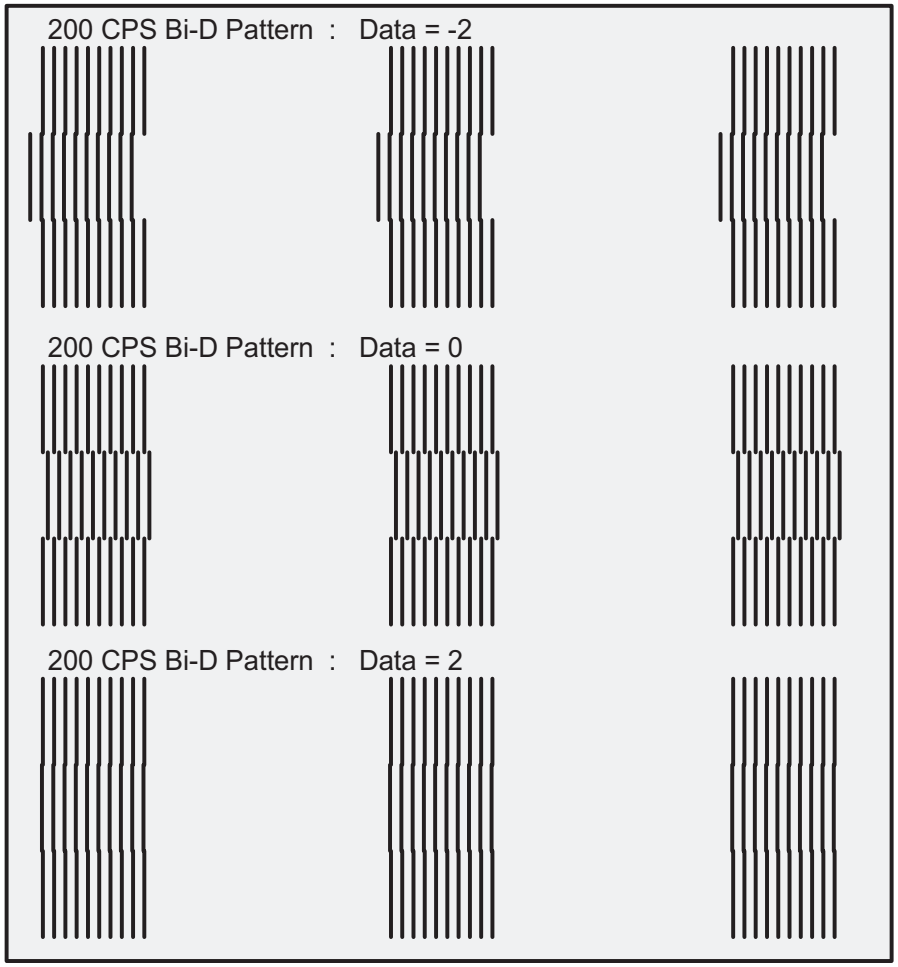


Figure 5-33. Bi-D Adjustment Pattern Sample

NOTE: Because this adjustment requires a high degree of precision, you may wish to use a magnifying glass or an eye-loupe when viewing the check pattern.

5. In the Bi-D Adjustment Menu, select **Adjust**. The screen below appears.

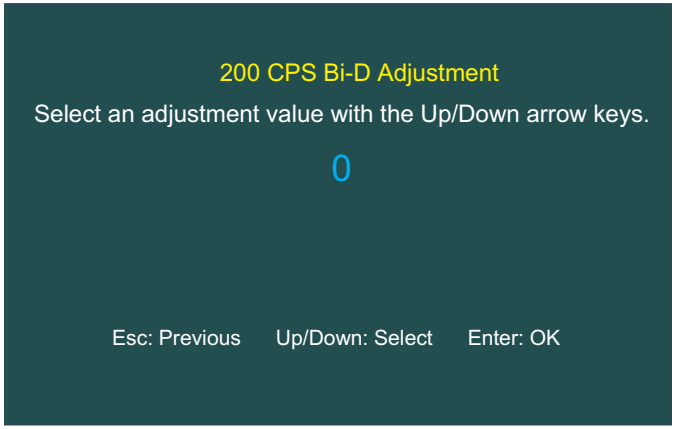


Figure 5-34. Bi-D Value Input Menu

6. The current Bi-d adjustment value appears in the center of the screen (for example, “0” as shown in the figure above). Using the Up and Down arrow keys, change the setting to the number that corresponds to the best-aligned pattern in the Bi-D adjustment printout.

7. After you have changed the value, press Enter, and the program stores the selected value.

8. Press Esc. The program returns to the Bi-D adjustment menu.

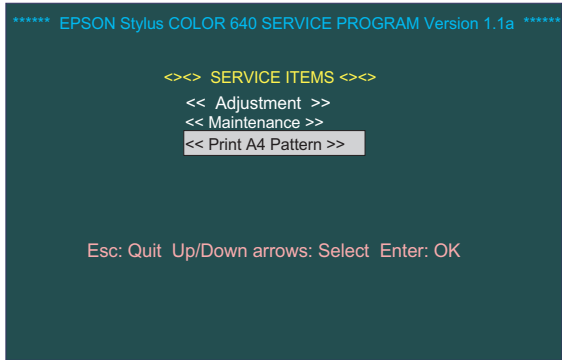
9. Check your results by printing another adjustment pattern. Continue repeating the adjustment, looking at the results each time, until you have achieved the correct adjustment.

5.2.2.11 Printing the A4 Check Pattern

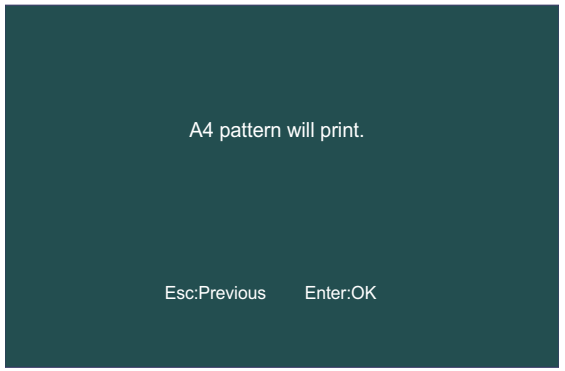
When you want a quick overview of all the adjustment settings on one page, run the A4 check pattern. The check pattern lets you view the current status of the printhead angle adjustment, Bi-d adjustment, and printhead voltage ID. It also lets you check nozzle output and the current value of the waste ink pad counter.

To print the A4 check pattern, follow these steps:

1. Enter the main menu. (Refer to Section 5.2.2.3.) You see this screen:



2. Select **Print A4 Pattern**. The following screen appears:



3. At the confirmation, press **Enter**. The check pattern begins to print.

CHAPTER

6

MAINTENANCE

6.1 Cleaning

This printer does not require regular cleaning. However, the following areas can be cleaned of dirt or debris as needed:

- Housing:
  To remove dust and dirt, wipe the exterior of the printer with a soft, clean cloth moistened with water. If the housing is stained with ink, use a cloth moistened with a mild detergent to wipe it off.
- Inside the printer:
  To clean inside the printer, use a vacuum cleaner to remove any dust or paper debris. To clean the paper feed roller, use a soft brush to wipe off any dust, or use a soft cloth moistened with FEDRON.

CAUTION

- **Never use chemical solvents, such as thinner, to clean the printer. These chemicals can damage the components of the printer.**
- **Be careful not to scratch the surface of the paper feed roller.**

6.2 Corrective Maintenance

If you notice the print quality decreasing, or if all the LED indicators flash simultaneously, the printer requires corrective maintenance. Take one of the following steps:

6.2.1 Printhead Cleaning

If the print quality diminishes (for example, if you see missing dots or white lines in the printout), you should perform the printhead cleaning operation. You can perform this operation either from the adjustment program or from the control panel of the printer itself. To clean the printhead from the adjustment program, see Section 5.2.2.5. To clean the printhead from the control panel, follow these steps:

1. Make sure the printer is in stand-by (the Power indicator is not blinking). Also, check to make sure the ink cartridge indicators are neither blinking nor on.
2. Hold down the cleaning button for at least 3 seconds.

   The printer performs the cleaning sequence. During cleaning, the Power indicator flashes. When the operation is complete, it stops flashing and the carriage returns to the home position.

6.2.2 Maintenance Request

When all the LED indicators flash simultaneously, the printer is issuing a maintenance request. A maintenance request occurs when the waste ink pad is full and needs to be replaced. This is determined by an ink counter that monitors the amount of ink expelled from the printhead during cleaning. To remove and replace the waste ink pad, see Section 4.2.4.2. After replacing the waste ink pad, you must reset the ink counter in order to clear the maintenance request. To reset the ink counter from the control panel, see Section 1.4.2; to reset it from the adjustment program, see Section 5.2.2.6.

6.3 Lubrication

EPSON has carefully determined the best types of oil and grease to use when lubricating the printer, as well as the optimal quantities to apply. Therefore, follow the instructions and specifications below when lubricating the printer.

CAUTION

- **Never use lubricants other than those specified in Table 6-1. Using other types of lubricants can damage the printer.**
- **Never apply more lubricant than specified in this manual. Applying too much lubricant can damage nearby printer parts.**
- **Make sure all surfaces are clean before lubricating them.**

Table 6-1. Specified Lubricants

Type	Name	EPSON Part Code	Supplier
Grease	G-26	B702600001	EPSON
Oil	O-12	1038991	EPSON

Table 6-2. Lubrication Points

Figure and Callout No.	Lubrication Points, Type, and Amount	Remarks
Fig 6-2, #1	**Lubrication Point:** where the PF roller and rear paper guide come into contact **Lubricant Type:** G-26 **Lubrication Amount:** apply to a half-turn of the PF roller	■ Use a syringe to apply the grease. ■ Apply the grease while rotating gear 67.2. ■ Do not get grease into the paper path.

Table 6-2. Lubrication Points (continued)

Figure and Callout No.	Lubrication Points, Type, and Amount	Remarks
Fig 6-2, #2	**Lubrication Point:** where the platen comes into contact with the following rollers: 1. Paper feed roller (1 contact point) 2. Paper eject roller (2 contact points) **Lubricant Type:** G-26 **Lubrication Amount:** 1. An area about 3/8 inch (10 mm) long on the paper feed roller 2. 2 points 1/16 inch (2 mm) long on the paper eject roller	■ Use a syringe to apply the grease. ■ Apply the grease to the platen hooks where they come into contact with each roller. ■ Do not get grease into the paper path.
Fig 6-3, #3	**Lubrication Point:** along the top frame where the carriage comes into contact with it **Lubricant Type:** G-26 **Lubrication Amount:** a small amount of grease along the whole length of the top frame	■ Use a syringe to apply the grease. ■ After applying the grease, make sure the carriage moves smoothly.
Fig 6-4, #4	**Lubrication Point:** the teeth of the following gears: 1. Gear 67.2 2. Gear 23.2 3. Combination gear 8,14.4 **Lubricant Type:** G-26 **Lubrication Amount:** 1. Apply to 1/4 of the gear's teeth 2. Apply to 1/3 of the gear's teeth 3. Apply to 1/3 of the gear's teeth	■ Use a syringe to apply the grease. ■ After you apply the grease, rotate the gears to distribute it evenly.
Fig 6-4, #5	**Lubrication Point:** the mounting shaft of gear 16,40.8 **Lubricant Type:** G-26 **Lubrication Amount:** an area approximately 3/16 inch (5 mm) long	■ Use a syringe to apply the grease.

Table 6-2. Lubrication Points (continued)

Figure and Callout No.	Lubrication Points, Type, and Amount	Remarks
Fig 6-5, #6	**Lubrication Point:** the left and right paper feed roller bushings **Lubricant Type:** G-26 **Lubrication Amount:** a small amount equivalent to an area about 1/8 inch (3 mm) in diameter	■ Use a syringe to apply the grease. ■ When you apply the grease to the right bushing, apply it from the paper path side and wipe off any excess grease that comes out near the capping assembly. ■ After applying the grease, rotate the paper feed roller to distribute it evenly on the bushings.
Fig 6-5, #7	**Lubrication Point:** the left and right eject roller bushings **Lubricant Type:** G-26 **Lubrication Amount:** apply a small amount evenly inside the bushings	■ Use a syringe to apply the grease. ■ Do not get grease into the paper path.
Fig 6-6, #8	**Lubrication Point:** where the timing belt tensioning mechanism slides against the top frame **Lubricant Type:** G-26 **Lubrication Amount:** about 1/16 inch (2 mm) long for each point	■ Use a syringe to apply the grease. ■ After lubricating it, make sure the tensioning mechanism slides when pressure is applied only from the spring.
Fig 6-7, #9	**Lubrication Point:** the hole in the right side of the ASF frame that holds the ASF drive shaft **Lubricant Type:** G-26 **Lubrication Amount:** apply lubricant evenly inside the hole	■ Use a syringe to apply the grease. ■ Do not let grease come into contact with the rubber rollers in the Auto-Sheet Feeder (ASF).
Fig 6-7, #10	**Lubrication Point:** where the hopper and the hopper release cams come into contact **Lubricant Type:** G-26 **Lubrication Amount:** apply lubricant evenly to the contact points	■ If any grease gets inside the ASF, wipe it off completely.

Table 6-2. Lubrication Points (continued)

Figure and Callout No.	Lubrication Points, Type, and Amount	Remarks
Fig 6-3, #11	**Lubrication Point:** the hole in the left side of the ASF frame where gear 34 is inserted **Lubricant Type:** G-26 **Lubrication Amount:** apply lubricant evenly inside the hole	■ If any grease gets inside the ASF, wipe it off completely.
Fig 6-1, #12	**Lubrication Point:** the oil pad in the carriage unit **Lubricant Type:** O-12 **Lubrication Amount:** 0.7 cc ***NOTE:*** *This is the amount that should be applied to a new pad when you're replacing an old one.*	■ Lubricate the oil pad only if: 1. You're replacing the carriage assembly. 2. You're replacing the oil pad. ■ Use a syringe to apply the oil. ■ Wait for the oil to soak evenly into the pad before installing the pad in the carriage unit. ■ If you accidentally apply too much oil to the pad, throw it away and use a new one.

CAUTION

- **Never apply oil directly to the CR guide shaft. Otherwise, you can damage printer components, including the printhead.**
- **Apply only the specified amount of oil to the oil pad. If you apply too much oil, throw away the pad and start over with a new one.**

Never apply more than 0.7 cc of oil.

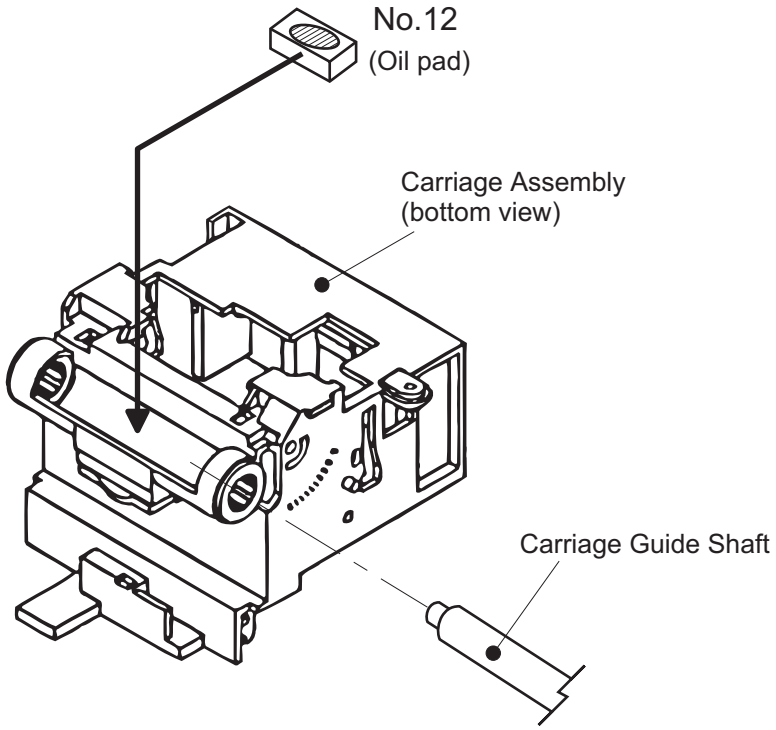


Figure 6-1. Applying Oil to the Oil Pad

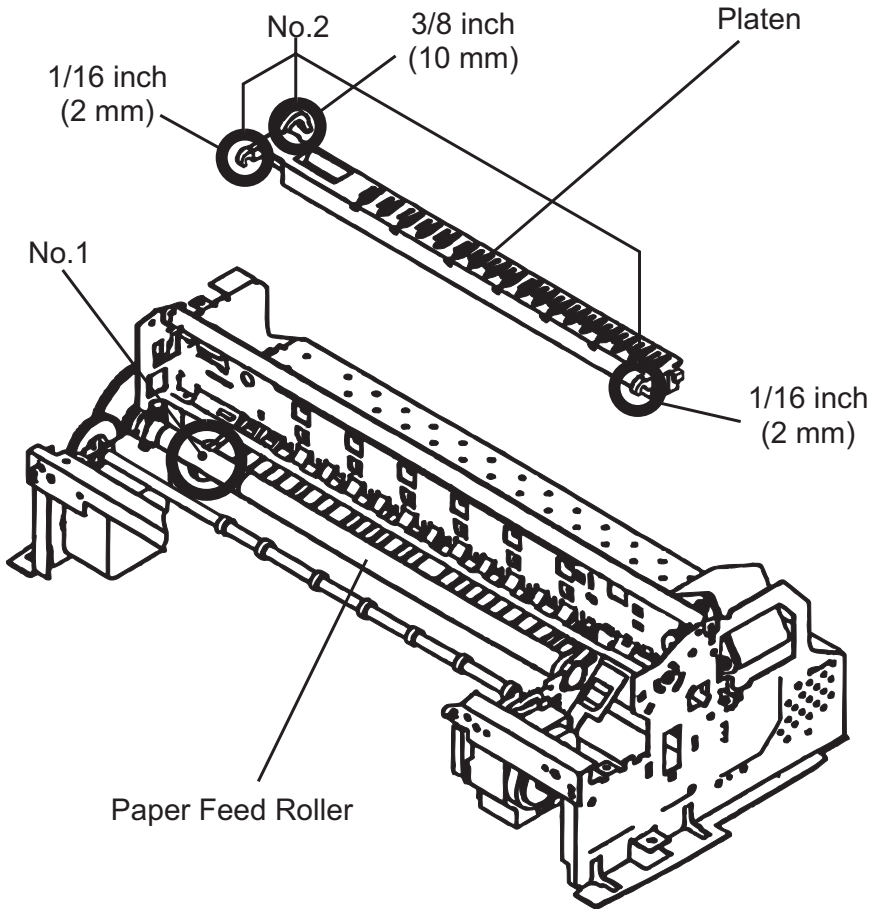


Figure 6-2. Paper Feed Roller and Platen

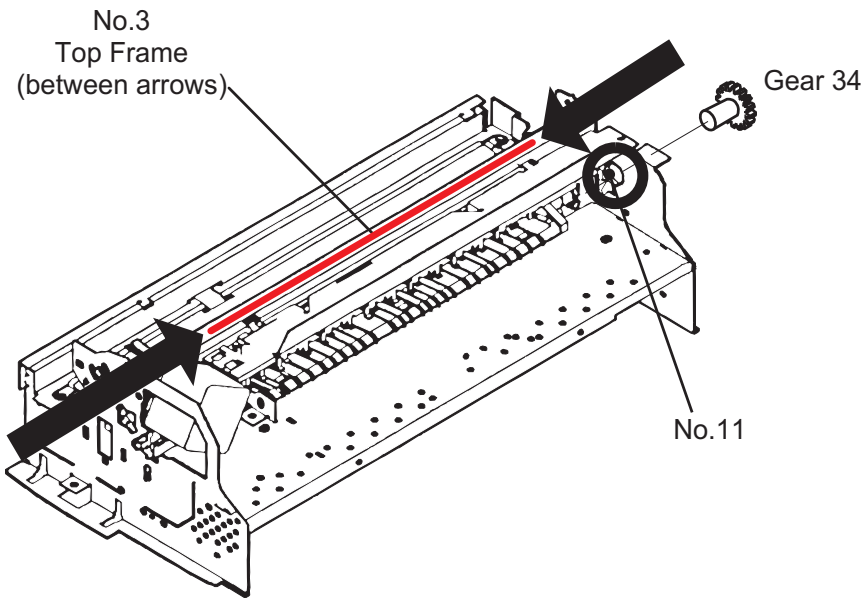


Figure 6-3. Top Frame and ASF Drive Gear

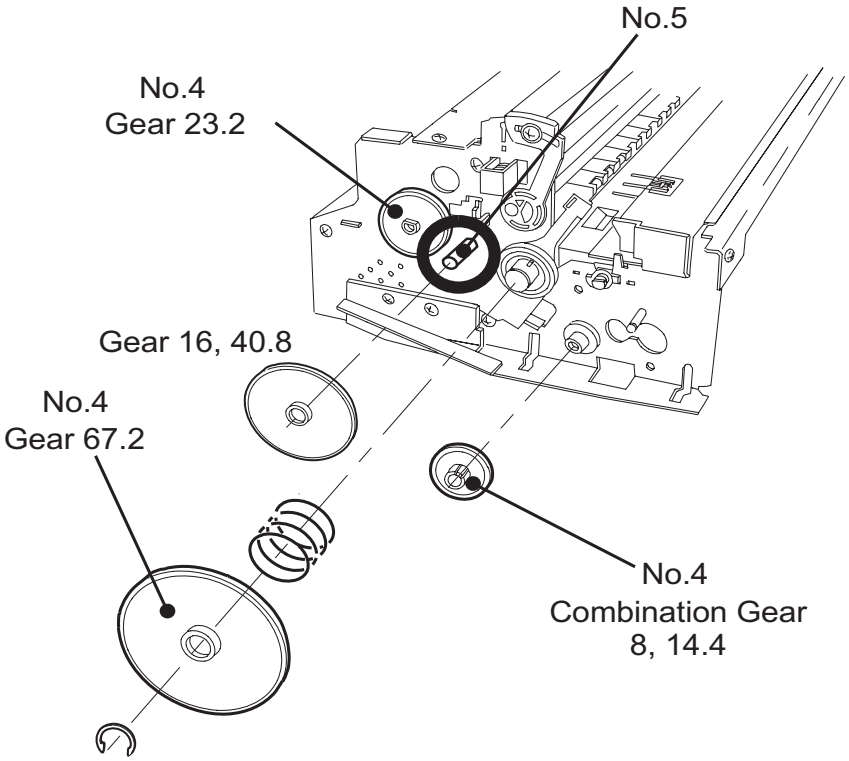


Figure 6-4. Gears

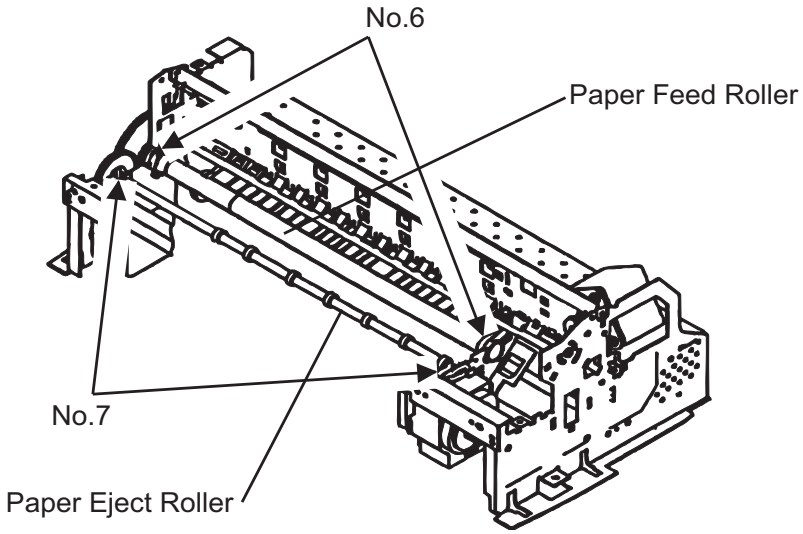


Figure 6-5. Paper Feed and Paper Eject Rollers

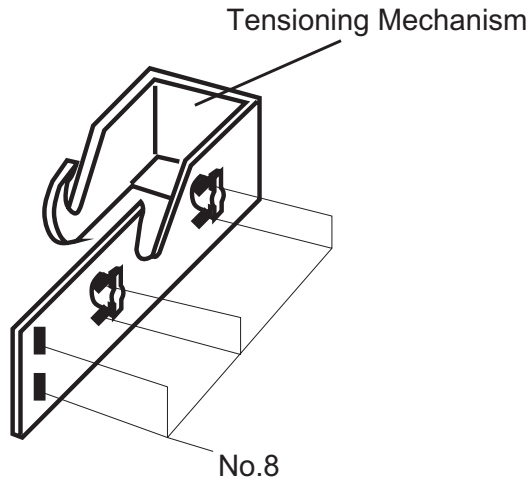


Figure 6-6. Timing Belt Tensioning Mechanism

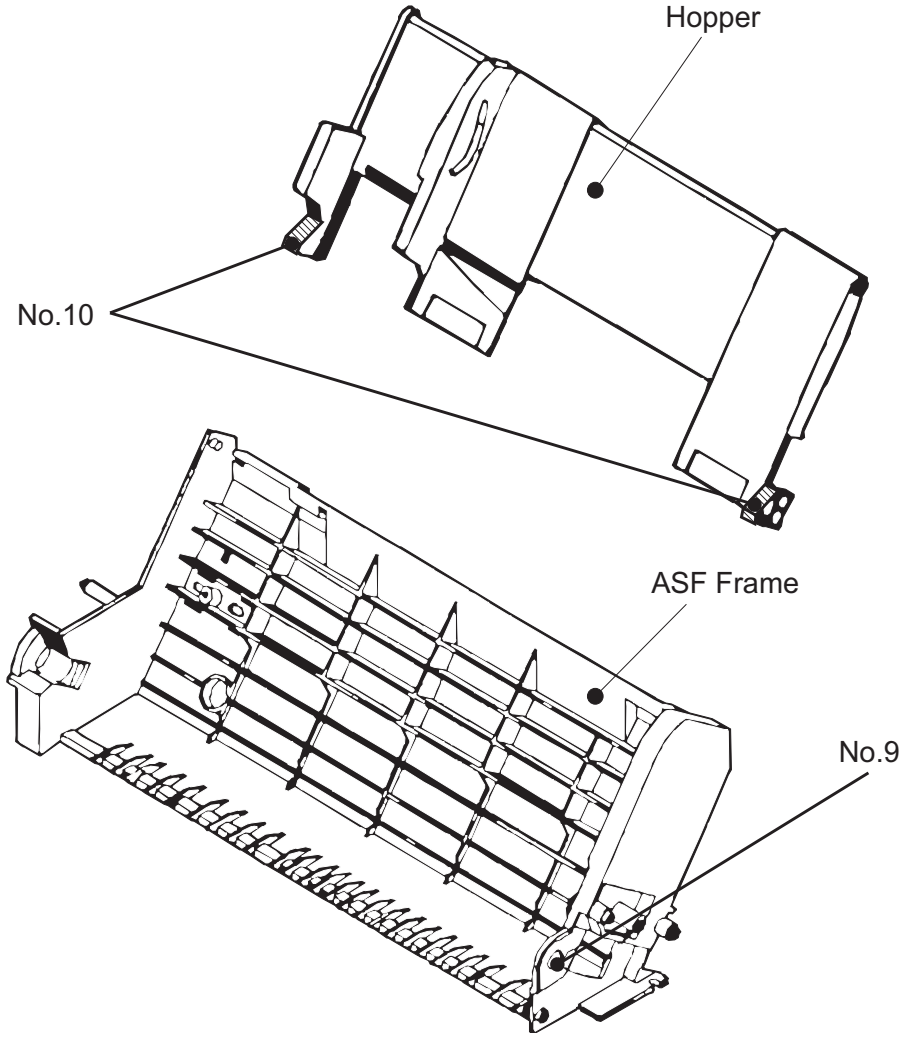


Figure 6-7. Hopper Assembly and ASF

CHAPTER

A

APPENDIX

A.1 Connector Summary (Stylus COLOR 440 and 640)

CAUTION

The connector information contained in this section applies only to the Stylus COLOR 440 and Stylus COLOR 640. If you need information on the Stylus COLOR 740, refer to Section A.2.

The following table lists the connectors used on the main board of the Stylus COLOR 440 and 640. The figure at right shows how the components are connected. Each connector's pin assignments are detailed in the tables on the following pages.

Table A-1. Main Board Connector Summary

Connector	Function	Pin Assignments
CN1	To parallel I/F	Table A-2
CN2	To serial I/F	Table A-3
CN3	To control panel	Table A-4
CN4	To PE sensor	Table A-5
CN5	To HP sensor	Table A-6
CN6	To CR motor	Table A-7
CN7	To PF motor	Table A-8
CN8	To printhead	Table A-9
CN10	To power supply board	Table A-10
CN11	To ASF sensor	Table A-11

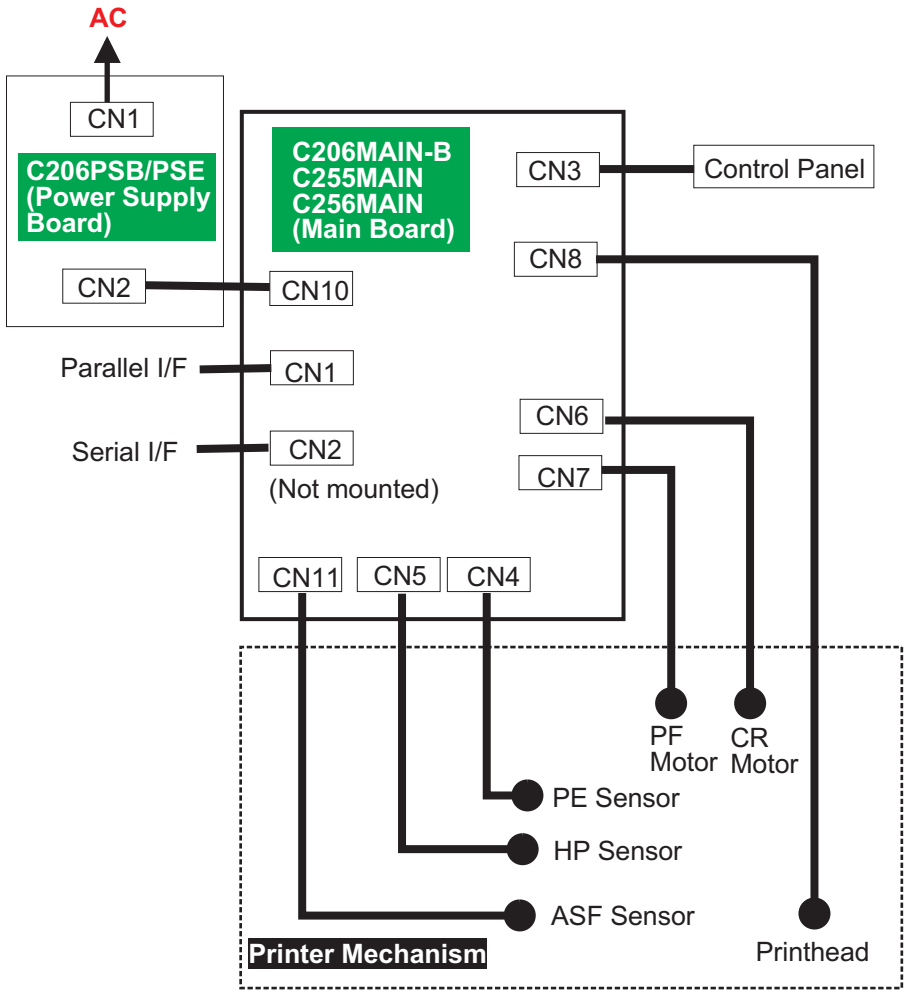


Figure A-1. Cable Connections in the Stylus COLOR 440 and 640

Table A-2. Parallel Interface Connector (CN1)

Pin No.	Signal Name	Return GND Pin	In/Out	Functional Description
1	$\overline{\text{STROBE}}$	19	In	The strobe pulse. Data is read in at the falling edge of this pulse.
2 to 9	DATA0 to DATA7	20 to 27	In	The DATA0 through DATA7 signals represent data bits 0 through 7. Each signal is at a HIGH level when data is logical 1, and at a LOW level when data is logical 0.
10	$\overline{\text{ACKNLG}}$	28	Out	This signal is a negative pulse indicating that the printer can again accept data.
11	BUSY	29	Out	A HIGH signal indicates that the printer cannot receive data.
12	PE	28	Out	A HIGH signal indicates a paper-out error.
13	SLCT	28	Out	Always HIGH when the printer is powered on.
14	$\overline{\text{AFXT}}$	30	In	Not used.
31	$\overline{\text{INIT}}$	30	In	The falling edge of a negative pulse or a LOW signal on this line causes the printer to initialize. Minimum 50 µs pulse is necessary.
32	$\overline{\text{ERROR}}$	29	Out	A LOW signal indicates a printer error condition.
36	$\overline{\text{SLIN}}$	30	In	Not used.
18	Logic-H	—	Out	Pulled up to +5 V via 3.9K ohm resistor.
35	+5V	—	Out	Pulled up to +5 V via 3.3K ohm resistor.
17	Chassis GND	—	—	Chassis ground.
16, 33, 19 to 30	GND	—	—	Signal ground.
15, 34	NC	—	—	Not connected.

Notes: *In and Out refer to the direction of signal flow from the printer's point of view. A slash in front of a signal name means that the signal is active LOW.*

Table A-3. Serial Interface Connector (CN2)

Pin No.	Signal Name	I/O	Functional Description
1	SCLK	Out	Synchronous clock signal
2	CTS	In	Clear To Send
3	TXD-	Out	Transmit Data (-)
4	SG	In	Signal Ground
5	RXD-	In	Receive Data (-)
6	TXD+	Out	Balanced Transmit Data (+)
7	DTR	Out	Data Terminal Ready
8	RXD+	In	Balanced Receive Data (+)

Table A-4. Control Panel Connector (CN3)

Pin	Signal Name	I/O	Function
1	LED0	Out	LED drive signal (0)
2	GND	—	Ground
3	LED1	Out	LED drive signal (1)
4	GND	—	Ground
5	LED2	Out	LED drive signal (2)
6	+5 V	—	Logic power supply
7	+5 V	—	Logic power supply
8	LED4	Out	LED drive signal (4)
9	SW1	In	Panel switch input (1)
10	PSC	In	Power on/off switch
11	SW0	In	Panel switch on/off (0)
12	SW2	In	Panel switch on/off (2)

Table A-5. PE Sensor Connector (CN4)

Pin	Signal Name	I/O	Function
1	PE	In	Sensor detect signal
2	GND	—	Ground
3	PEV	—	Sensor power supply (+5 V)

Table A-6. HP Sensor Connector (CN5)

Pin	Signal Name	I/O	Function
1	HP	In	Sensor detect signal
2	GND	—	Ground
3	HPV	—	Sensor power supply(+5V)

Table A-7. CR Motor Connector (CN6)

Pin	Signal Name	I/O	Function
1	CRA	Out	Phase drive signal (A)
2	CRB	Out	Phase drive signal (B)
3	CR-A	Out	Phase drive signal (-A)
4	CR-B	Out	Phase drive signal (-B)

Table A-8. PF Motor Connector (CN7)

Pin	Signal Name	I/O	Function
1	PFA	Out	Phase drive signal (A)
2	PFB	Out	Phase drive signal (B)
3	PF-A	Out	Phase drive signal (-A)
4	PF-B	Out	Phase drive signal (-B)

Table A-9. Printhead Connector (CN8)

(Stylus COLOR 440: C206MAIN-B and C255MAIN only)

Pin	Signal Name	I/O	Function
1	BCO	In	Black ink cartridge detect signal
2	CCO	In	Color ink cartridge detect signal
3	THM	In	Thermistor sensor output
4	GND	—	Ground
5	LAT	Out	Head data latch pulse output
6	GND	—	Ground
7	SI2	Out	Head data output (2)
8	GND	—	Ground
9	SI1	Out	Head data output (1)
10	GND	—	Ground
11	CLK	Out	Clock pulse for head data transfer
12	GND	—	Ground
13	NCHG	Out	Head all on pulse output
14	GND	—	Ground
15	VDD	—	Logic power supply (+5 V)
16	GND2	—	Ground
17	GND2	—	Ground
18	GND2	—	Ground
19	COM	—	Head drive power supply
20	COM	—	Head drive power supply
21	COM	—	Head drive power supply
22	VHV	—	Head drive voltage control signal
23	VHV	—	Head drive voltage control signal

Table A-10. Printhead Connector (CN8)
(Stylus COLOR 640: C256MAIN only)

Pin	Signal Name	I/O	Function
1	BCO	In	Black ink cartridge detect signal
2	CCO	In	Color ink cartridge detect signal
3	THM	In	Thermistor sensor output
4	GND	—	Ground
5	LAT	Out	Head data latch pulse output
6	GND	—	Ground
7	SI3	Out	Head data output (3)
8	GND	—	Ground
9	SI2	Out	Head data output (2)
10	GND	—	Ground
11	SI1	Out	Head data output (1)
12	GND	—	Ground
13	CLK	Out	Clock pulse for head data transfer
14	GND	—	Ground
15	NCHG	Out	Head all on pulse output
16	GND	—	Ground
17	VDD	—	Logic power supply (+5V)
18	GND2	—	Ground
19	GND2	—	Ground
20	GND2	—	Ground
21	COM	—	Head drive power supply
22	COM	—	Head drive power supply
23	COM	—	Head drive power supply
24	VHV	—	Head drive voltage control signal
25	VHV	—	Head drive voltage control signal

Table A-11. Power Supply Connector (CN10)

Pin	Signal Name	I/O	Function
1	+42 V	—	Mechanism drive power supply
2	+42 V	—	Mechanism drive power supply
3	GND	—	Ground
4	GND	—	Ground
5	PSC	Out	Power supply switch output signal
6	GND	—	Ground
7	GND	—	Ground
8	+5 V	—	Logic power supply

Table A-12. ASF Sensor Connector (CN11)

Pin	Signal Name	I/O	Function
1	ASF	In	Sensor detect signal
2	GND	—	Ground
3	ASFV	—	Sensor power supply (+5 V)

A.2 Connector Summary (Stylus COLOR 740)

CAUTION

The connector information contained in this section applies only to the Stylus COLOR 740. If you need information on the Stylus COLOR 440 or 640, refer to Section A.1.

The following table lists the connectors used on the C257MAIN board of the Stylus COLOR 740. The figure at right shows how the components are connected. Each connector's pin assignments are detailed in the tables on the following pages.

Table A-13. Main Board Connector Summary

Connector	Function	Pin Assignments
CN1	To parallel I/F	Table A-14
CN2	To serial I/F	Table A-15
CN3	To USB I/F	Table A-16
CN4	To HP sensor	Table A-17
CN5	To PE sensor	Table A-18
CN6	To ASF sensor	Table A-19
CN7	To CR motor	Table A-20
CN8	To PF motor	Table A-21
CN9	To printhead	Table A-24
CN10	To power supply board	Table A-22
CN11	To control panel	Table A-23

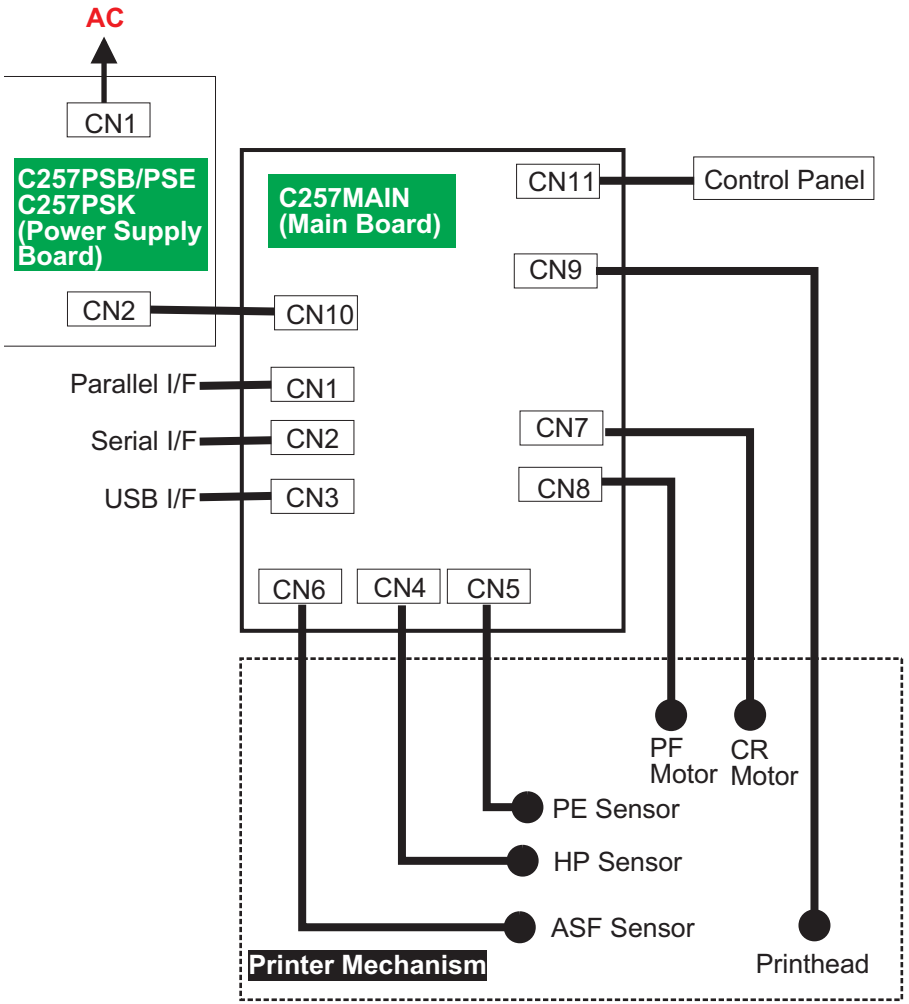


Figure A-2. Cable Connections in the Stylus COLOR 740

Table A-14. Parallel Interface Connector (CN1)

Pin No.	Signal Name	Return GND Pin	In/Out	Functional Description
1	$\overline{\text{STROBE}}$	19	In	The strobe pulse. Data is read in at the falling edge of this pulse.
2 to 9	DATA0 to DATA7	20 to 27	In	The DATA0 through DATA7 signals represent data bits 0 through 7. Each signal is at a HIGH level when data is logical 1, and at a LOW level when data is logical 0.
10	$\overline{\text{ACKNLG}}$	28	Out	This signal is a negative pulse indicating that the printer can again accept data.
11	BUSY	29	Out	A HIGH signal indicates that the printer cannot receive data.
12	PE	28	Out	A HIGH signal indicates a paper-out error.
13	SLCT	28	Out	Always HIGH when the printer is powered on.
14	$\overline{\text{AFXT}}$	30	In	Not used.
31	$\overline{\text{INIT}}$	30	In	The falling edge of a negative pulse or a LOW signal on this line causes the printer to initialize. Minimum 50 µs pulse is necessary.
32	$\overline{\text{ERROR}}$	29	Out	A LOW signal indicates a printer error condition.
36	$\overline{\text{SLIN}}$	30	In	Not used.
18	Logic-H	—	Out	Pulled up to +5 V via 3.9K ohm resistor.
35	+5 V	—	Out	Pulled up to +5 V via 3.3K ohm resistor.
17	Chassis GND	—	—	Chassis ground.
16,33, 19 to 30	GND	—	—	Signal ground.
15,34	NC	—	—	Not connected.

Notes: *In and Out refer to the direction of signal flow from the printer's point of view. A slash in front of a signal name means that the signal is active LOW.*

Table A-15. Serial Interface Connector (CN2)

Pin No.	Signal Name	I/O	Functional Description
1	SCLK	Out	Synchronous clock signal
2	CTS	In	Clear to send
3	TXD-	Out	Transmit data (-)
4	SG	In	Signal ground
5	RXD-	In	Receive data (-)
6	TXD+	Out	Balanced transmit data (+)
7	DTR	Out	Data terminal ready
8	RXD+	In	Balanced receive data (+)

Table A-16. USB Interface Connector (CN3)

Pin No.	Signal Name	I/O	Functional Description
1	VCC	—	Cable power; maximum power consumption is 100 mA
2	-Data	Bi-D	Data
3	+Data	Bi-D	Data; pulled up to +3.3 V via a 1.5K ohm resistor
4	Ground	—	Cable ground

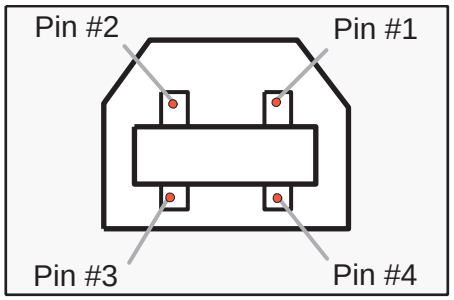


Figure A-3. USB Pin Assignments

Table A-17. HP Sensor Connector (CN4)

Pin	Signal Name	I/O	Function
1	HP	In	Sensor detect signal
2	GND	—	Ground
3	HPV	—	Sensor power supply (+5 V)

Table A-18. PE Sensor Connector (CN5)

Pin	Signal Name	I/O	Function
1	PE	In	Sensor detect signal
2	GND	—	Ground
3	PEV	—	Sensor power supply (+5 V)

Table A-19. ASF Sensor Connector (CN6)

Pin	Signal Name	I/O	Function
1	ASF	In	Sensor detect signal
2	GND	—	Ground
3	ASFV	—	Sensor power supply (+5 V)

Table A-20. CR Motor Connector (CN7)

Pin	Signal Name	I/O	Function
1	CRA	Out	Phase drive signal (A)
2	CR-A	Out	Phase drive signal (-A)
3	CRB	Out	Phase drive signal (B)
4	CR-B	Out	Phase drive signal (-B)

Table A-21. PF Motor Connector (CN8)

Pin	Signal Name	I/O	Function
1	PFA	Out	Phase drive signal (A)
2	PFB	Out	Phase drive signal (B)
3	PF-A	Out	Phase drive signal (-A)
4	PF-B	Out	Phase drive signal (-B)

Table A-22. Power Supply Connector (CN10)

Pin	Signal Name	I/O	Function
1	+42 V	—	Mechanism drive power supply
2	+42 V	—	Mechanism drive power supply
3	GND	—	Ground
4	GND	—	Ground
5	PSC	Out	Power supply switch output signal
6	GND	—	Ground
7	GND	—	Ground
8	+5 V	—	Logic power supply

Table A-23. Control Panel Connector (CN11)

Pin	Signal Name	I/O	Function
1	SW2	In	Panel switch on/off (2)
2	SW0	In	Panel switch on/off (0)
3	PSC	In	Power on/off switch
4	SW1	In	Panel switch input (1)
5	LED3	Out	LED drive signal (3)
6	+5 V	—	Logic power supply
7	+5 V	—	Logic power supply
8	LED2	Out	LED drive signal (2)
9	GND	—	Ground
10	LED1	Out	LED drive signal (1)
11	GND	—	Ground
12	LED0	Out	LED drive signal (0)

Table A-24. Printhead Connector (CN9)

Pin	Signal Name	I/O	Function
1	BCO	In	Black ink cartridge detect signal
2	CCO	In	Color ink cartridge detect signal
3	THM	In	Thermistor detect signal
4	GND	—	Ground
5	LAT	Out	Head data latch pulse output
6	GND	—	Ground
7	SI6	Out	Head data output (6)
8	SI5	Out	Head data output (5)
9	SI4	Out	Head data output (4)
10	SI3	Out	Head data output (3)
11	SI2	Out	Head data output (2)
12	SI1	Out	Head data output (1)
13	GND	—	Ground
14	CLK	Out	Clock pulse for head data transfer
15	GND	—	Ground
16	NCHG	Out	Head all on pulse output
17	GND	—	Ground
18	VDD	—	Logic power supply (+5 V)
19	GND2	—	Ground
20	GND2	—	Ground
21	GND2	—	Ground
22	GND2	—	Ground
23	COM	—	Head drive power supply
24	COM	—	Head drive power supply
25	COM	—	Head drive power supply
26	COM	—	Head drive power supply
27	VHV	—	Head drive voltage control signal

A.3 EEPROM Address Map (Stylus COLOR 440 and 640)

CAUTION

The address information contained in this section applies only to the Stylus COLOR 440 and Stylus COLOR 640. If you need information on the Stylus COLOR 740, refer to Section A.4.

Table A-25 lists the EEPROM addresses for the Stylus COLOR 440 and 640. In some cases, a given address may perform a different function in one printer than in the other. In this case, the address row has been split into separate parts for the Stylus COLOR 440 and 640.

Table A-25.
Stylus Color 440/640 EEPROM Address Map

Address	Explanation	Setting	QPIT Settings	Factory Settings
00H	Password 0		54H	—
01H			0FH	—
02H	Market	0: World 1: Japan 2: Custom (MJ-)** 3: Custom (Stylus Color) ** 4: Custom (other name) **	00H	(*1) (*3)
03H	1st dot adjustment	-40≤ n ≤40 (by 1/1440 inch)	00H	(*1)
04H	Bi-D adjustment data	-36≤ n ≤36 (by 1/1440 inch)	00H	(*1)
05H	Uni-D adjustment data	-36≤ n ≤36 (by 1/1440 inch)	00H	(*1)
06H	Stylus Color 440 Reserved		00H	—
	Stylus Color 640 CG	0: STD 1: NLSP	00H	(*1)
07H	Reserved		00H	—
08H	Carriage speed adjustment data	-4≤ n ≤4 (by G.A timer unit)	00H	(*1)
09H	Stylus Color 440 Reserved		00H	—
	Stylus Color 640 Carriage speed adjustment data for 1440 dpi	-4≤ n ≤4 (by G.A. timer unit)	00H	(*1)
0AH	Head actuator rank ID for VhN		12H	(*1)
0BH	Head actuator rank ID for Twh2		01H	(*1)

Stylus Color 440/640 EEPROM Address Map (Continued)

Address	Explanation	Setting	QPIT Settings	Factory Settings
0CH	Stylus Color 440 Reserved		00H	(*1)
	Stylus Color 640 Head actuator rank ID for VhM		10H	(*1)
0DH	Stylus Color 440 Reserved		00H	—
	Stylus Color 640 Head actuator rank ID for VhMS		00H	(*1)
0EH	Reserved		00H	—
0FH	Reserved		00H	—
10H	Password 1		5AH	—
11H			0FH	—
12H	Custom EEPROM sub number		00H	00H
13H			00H	00H
14H			00H	00H
15H			00H	00H
16H	Reserved		00H	—
17H	Reserved		00H	—
18H	CPSI password		00H	00H
19H			00H	00H
1AH			00H	00H
1BH			00H	00H
1CH	CPSI flags	bit 7: CPSI license 0: Disable, 1: Enable bit 6: CPSI Font license 0: Disable, 1: Enable	00H	00H
1DH	Reserved		00H	—
1EH	Reserved		00H	—
1FH	EEPROM Revision		42H	—

Stylus Color 440/640 EEPROM Address Map (Continued)

Address	Explanation	Setting	QPIT Settings	Factory Settings
20H	Password 2		5AH	—
21H			0FH	—
22H	Interface selection	0: Auto, 1: Parallel 2: Serial	00H	00H (*2)
23H	Interface wait time	0 to 255 (by second)	0AH	0AH
24H	Parallel I/F speed	0: High speed 1: Normal	00H	00H
25H	Stylus Color 440 Reserved		00H	—
	Stylus Color 640 Font	0: Couier	00H	00H
26H	Stylus Color 440 Reserved		00H	—
	Stylus Color 640 Pitch	0: 10 cpi	00H	00H
27H	Stylus Color 440 Print direction control	0: Bi-D 1: Uni-D 2: Auto	02H	02H
	Stylus Color 640 Print direction control	2: Auto	02H	02H
28H	Stylus Color 440 CG table	0: PC437 1: PC850	00H	(*1)
	Stylus Color 640 CG table	0: PC437 1: PC850	08H	00H
29H	Reserved		00H	—
2AH	Auto LF/Network I/F mode	bit 1: Network I/F mode (0=off, 1=on) bit 0: Auto line feed (0=off, 1=on)	00H	00H

Stylus Color 440/640 EEPROM Address Map (Continued)

Address	Explanation	Setting	QPIT Settings	Factory Settings
2BH	Panel mask function	bit 7: Enable Self Test bit 6: Enable Hex Dump bit 5: Extended settings bit 2: Cleaning bit 1: Replace I/C bit 0: Load/Eject	00H	00H (*3)
2CH	Reserved		00H	—
2DH	Reserved		00H	—
2EH	Reserved		00H	—
2FH	Reserved		00H	—
30H	Password 3		5AH	—
31H			0FH	—
32H	Reserved		00H	—
33H	Reserved		00H	—
34H	Top margin	42 to 44 × 360 (by 1/360 inch)	78H	78H (*3)
35H			00H	00H (*3)
36H	Stylus Color 440 Reserved		00H	—
37H	Stylus Color 640 Bottom margin	1244 to 44 × 360 (by 1/360 inch)	36H=F0H 37H=1EH	36H=F0H 37H=1EH
38H	Stylus Color 440 Reserved		00H	—
39H	Stylus Color 640 Page length	1244 to 44 × 360 (by 1/360 inch)	38H=F0H 39H=1EH	38H=F0H 39H=1EH
3AH	Reserved		00H	—
3BH	Reserved		00H	—
3CH	Reserved		00H	—
3DH	Reserved		00H	—

Stylus Color 440/640 EEPROM Address Map (Continued)

Address	Explanation	Setting	QPIT Settings	Factory Settings
3EH	CR-phase of home		00H	00H
3FH	ERROR number		00H	00H
40H	Password 4		5AH	—
41H			0FH	—
42H	Ink flags	bit 7: Reserved bit 6: black “one time” bit 5: color “one time” bit 4: Initial fill required bit 3: Reserved bit 2: in cleaning seq. bit 1: black CL required bit 0: color CL required	00H	10H
43H	Ink flags 2	bit 2: YMC cartridge changed and cleaned 0: first cartridge 1: changed bit 1: Black cartridge changed and cleaned 0: first cartridge 1: changed bit 0: Black cartridge changed and cleaned 0: with YMC cartridge 1: alone	00H	00H
44H	Ink counter Cb (total) 1 count=100 ng		00H	00H
45H			00H	00H
46H			00H	00H
47H			00H	00H

Stylus Color 440/640 EEPROM Address Map (Continued)

Address	Explanation	Setting	QPIT Settings	Factory Settings
48H	Ink counter CY (total) 1 count=100 ng		00H	00H
49H			00H	00H
4AH			00H	00H
4BH			00H	00H
4CH	Ink counter Cm (total) 1 count=100 ng		00H	00H
4DH			00H	00H
4EH			00H	00H
4FH			00H	00H
50H	Password 5		5AH	-
51H			0FH	-
52H	Ink counter Cc (total) 1 count=100 ng		00H	00H
53H			00H	00H
54H			00H	00H
55H			00H	00H
56H	Ink counter Csm (total) 1 count=100(ng)		00H	00H
57H			00H	00H
58H			00H	00H
59H			00H	00H
5AH	Ink counter Custodial 1 count=100 ng		00H	00H
5BH			00H	00H
5CH			00H	00H
5DH			00H	00H
5EH	Reserved		00H	-
5FH	Reserved		00H	-
60H	Password 6		5AH	-
61H			0FH	-
62H	Ink counter Rb		00H	00H
63H			00H	00H
64H	Ink counter Ry		00H	00H
65H			00H	00H

Stylus Color 440/640 EEPROM Address Map (Continued)

Address	Explanation	Setting	QPIT Settings	Factory Settings
66H	Ink counter A		00H	00H (*2)
67H			00H	00H (*2)
68H	Power off time		00H	00H (*2)
69H			00H	00H (*2)
6AH	CL time		00H	00H (*2)
6BH			00H	00H (*2)
6CH	Accumulated printing time	0: 0 minute 1: 15 minutes 2: 30 minutes 3: 60 minutes 4: 90 minutes 5: 120 minutes	00H	00H
6DH			00H	00H
6EH	Stylus COLOR 440 Dot size for Economy mode	0: Normal × 2 dot 1: Normal × 1 dot	00H	00H (*4)
	Stylus COLOR 640 Reserved		00H	-
6FH	Reserved		00H	-
70H	Password 7		5AH	-
71H			0FH	-
72H to 79H, 7AH to 7FH	Customized model name	string of counter strings of model field for Device ID	00H	00H

Notes:

**: Change the model name of the IEEE-1284 Device ID.

**1. Set at the factory.*

**2. Set when the EEPROM is intialized from the control panel.*

**3. 01H is a factory setting for the Pacific market. (At address 35H, this note applies only to the Stylus COLOR 440.)*

**4. This address sets the dot size when the user selects "Economy Mode" (180 x 180 dpi) from the printer driver. Ink life is increased by choosing Normal × 1 dot (01H), but the output will be paler than when using the factory-set Normal × 2 dot (00H).*

A.4 EEPROM Address Map (Stylus COLOR 740)

CAUTION

The address information contained in this section applies only to the Stylus COLOR 740. If you need information on the Stylus COLOR 440 or 640, refer to Section A.3.

Table A-26 lists the EEPROM addresses for the Stylus COLOR 740.

Table A-26. Stylus COLOR 740 EEPROM Address Map

Address	Explanation	Setting	QPIT Settings	Factory Settings
00H	Password 0		0FH	—
01H			5AH	—
02H	EEPROM mapping revision		41H	—
03H	Board ID	0: On-board RAM is 8 Mbit. 1: On-board RAM is 16 Mbit.	00H	(*1)
04H	CG	0: STD, 1: NLSP	00H	(*1)
05H	Market ID	0: Standard (World) 2: Custom	00H	(*1)
06H	Custom EEPROM sub number		00H	00H
07H			00H	00H
08H			00H	00H
09H			00H	00H
0AH	Head actuator rank ID for VhN		00H	(*1)
0BH	Head actuator rank ID for Vhμ		00H	(*1)
0CH	Head actuator rank ID for VhL		00H	(*1)
0DH	Head actuator rank ID for AR		00H	(*1)
0EH	Head rank MW-ID		00H	(*1)
0FH	Reserved for Head ID		00H	—
10H	Reserved for Head ID		00H	—
11H	Reserved for Head ID		00H	—
12H	Head actuator rank ID for lwAB		00H	(*1)
13H	Head actuator rank ID for lwCD		00H	(*1)

Table A-26. Stylus COLOR 740 EEPROM Address Map (continued)

Address	Explanation	Setting	QPIT Settings	Factory Settings
14H	Head actuator rank ID for lwEF		00H	(*1)
15H	Bi-d adjustment data for Normal-dot	-36 ≤ n ≤ +36 (by 1/1440 inch)	00H	(*1)
16H	Bi-d adjustment data for Micro-dot	-36 ≤ n ≤ +36 (by 1/1440 inch)	00H	(*1)
17H	Bi-d adjustment data for Variable-dot	-36 ≤ n ≤ +36 (by 1/1440 inch)	00H	(*1)
18H	Uni-d adjustment data	-36 ≤ n ≤ +36 (by 1/1440 inch)	00H	(*1)
19H	Reserved for adjustment data		00H	-
1AH	Reserved for adjustment data.		00H	-
1BH	1st dot position adjustment data	-40 ≤ n ≤ +40 (by 1/1440 inch)	00H	(*1)
1CH	Carriage speed adjustment data	-4 ≤ n ≤ +4 (by G.A. timer unit)	00H	(*1)
1DH	Carriage phase on Home		00H	-
1EH	Paper sensor adjustment data	-127 ≤ n ≤ +127 (by 1/720 inch)	00H	(*1)
1FH	ERROR Code		00H	00H
20H	CPSI password		00H	00H
21H			00H	00H
22H			00H	00H
23H			00H	00H
24H	CPSI license flag	0: disable 1: enable	00H	00H
25H	CPSI font license	0: disable 1: enable	00H	00H

Table A-26. Stylus COLOR 740 EEPROM Address Map (continued)

Address	Explanation	Setting	QPIT Settings	Factory Settings
26H	Interface selection	0: Auto 1: Parallel 2: Serial 3: USB	00H	00H (*2)
27H	Interface time-out	0 to 255 (by second, value of 0 means 10 seconds)	0AH	0AH
28H	Compatibility speed	0: Fast, 1: Slow 2: Special-1, 3: Special-2	00H	00H
29H	ECP speed *3	0: Fast, 1: Slow	00H	00H
2AH			00H	00H
2BH	I/F Control flags	bit 1: ECP mode (0=Off, 1=On) *4 bit 0: IEEE1284 mode (0=On, 1=Off) *5	00H	00H
2CH			00H	01H
2DH	Reserved for USB		00H	-
2EH	Reserved for USB		00H	-
2FH	Reserved for USB		00H	-
30H	Font	0: Roman 1: Sans Serif 2: Courier 3: Prestige 4: Script 10: Roman T 11: Sans Serif 7: Draft	00H	02H
31H	Pitch	0: 10 cpi 1: 12 cpi 2: 15 cpi 3: 17 cpi 4: 20 cpi 5: Proportional	00H	00H
32H	Print direction control	0: Bi-D 1: Uni-D 2: Auto	02H	02H

Table A-26. Stylus COLOR 740 EEPROM Address Map (continued)

Address	Explanation	Setting	QPIT Settings	Factory Settings
33H	CG table	0: Italic U.S.A. 1: Italic France 2: Italic Germany 3: Italic U.K. 4: Italic Denmark 5: Italic Sweden 6: Italic Italy 7: Italic Spain 8: PC437 9: PC437 Greek 10: PC850 11: PC860 12: PC863 13: PC865 14: PC861 15: BRASCII 16: Abicomp 17: Roman 8 18: ISO Latin1 19: PC853 20: PC855 21: PC852 22: PC857 23: PC866 24: PC869 25: MAZOWIA 26: Code MJK 27: ISO8859-7 28: ISO Latin 1T 29: Bulgaria 30: PC774 31: Estonia 32: ISO 8859-2 33: PC 866 LAT 34: PC 866 UKR 35: PC AR864	08H	08H

Table A-26. Stylus COLOR 740 EEPROM Address Map (continued)

Address	Explanation	Setting	QPIT Settings	Factory Settings
33H (cont'd)	CG table	36: PC APTEC 37: PC 708 38: PC720 39: Hebrew7 40: Hebrew8 41: PC862	08H	08H
34H	Auto LF, Network I/F mode	bit1: Network I/F mode (0=0ff, 1=On), bit0: Auto line feed (0=Off, 1=On)	00H	00H
35H	Panel mask function	bit 7: Entry Self-Test bit 6: Entry Hex-Dump bit 5: Extended settings bit 4: Reserved bit 3: Reserved bit 2: Cleaning bit 1: Replace I/C bit 0: Load/Eject	00H	00H
36H	Top margin	42 to 44x360 (by 1/360 inch)	00H	00H
37H			78H	78H
38H	Bottom margin	1244 to 44x360 (by 1/360 inch)	IEH	IEH
39H			F0H	F0H
3AH	Page length	1244 to 44x360 (by 1/360 inch)	IEH	IEH
3BH			F0H	F0H
3CH	Reserved for main		00H	-
3DH	Reserved for main		00H	-
3EH	Reserved for main		00H	-
3FH	Reserved for main		00H	-
40H	Password 1		0FH	-
41H			5AH	-

Table A-26. Stylus COLOR 740 EEPROM Address Map (continued)

Address	Explanation	Setting	QPIT Settings	Factory Settings
42H	Ink flag 1	bit 7: Reserved bit 6: black one-time bit 5: color one-time bit 4: Initial fill required bit 3: Reserved bit 2: ink cleaning seq. Bit 1: black CL required bit 0: color CL required	00H	00H
43H	Ink flag 2	bit 2: YMC cartridge changed and cleaned bit 1: Black cartridge changed and cleaned bit 0: Black cartridge changed and cleaned	00H	00H
44H	Ink counter Cb		00H	00H
45H			00H	00H
46H			00H	00H
47H			00H	00H
48H	Ink counter Cy		00H	00H
49H			00H	00H
4AH			00H	00H
4BH			00H	00H
4CH	Ink counter Cm		00H	00H
4DH			00H	00H
4EH			00H	00H
4FH			00H	00H
50H	Ink counter Cc		00H	00H
51H			00H	00H
52H			00H	00H
53H			00H	00H
54H	Ink counter Clm		00H	00H
55H			00H	00H
56H			00H	00H
57H			00H	00H

Table A-26. Stylus COLOR 740 EEPROM Address Map (continued)

Address	Explanation	Setting	QPIT Settings	Factory Settings
58H	Ink counter Clc		00H	00H
59H			00H	00H
5AH			00H	00H
5BH			00H	00H
5CH	Ink counter Rb		00H	00H
5DH			00H	00H
5EH	Ink counter Ry		00H	00H
5FH			00H	00H
60H	Ink counter A		00H	00H(*2)
61H			00H	00H(*2)
62H	Power off time		00H	00H(*2)
63H			00H	00H(*2)
64H	CL time		00H	00H(*2)
65H			00H	00H(*2)
66H	accumulated printing time		00H	00H
67H			00H	00H
68H	Reserved for ink system		00H	-
69H	Reserved for ink system		00H	-
6AH	Printer-ID Strings [22]		00H	00H
6BH			00H	00H
6CH			00H	00H
6DH			00H	00H
6EH			00H	00H
6FH			00H	00H
70H			00H	00H
71H			00H	00H
72H			00H	00H
73H			00H	00H
74H			00H	00H
75H			00H	00H

Table A-26. Stylus COLOR 740 EEPROM Address Map (continued)

Address	Explanation	Setting	QPIT Settings	Factory Settings
76H			00H	00H
77H			00H	00H
78H			00H	00H
79H			00H	00H
7AH			00H	00H
7BH			00H	00H
7CH			00H	00H
7DH			00H	00H
7EH			00H	00H
7FH			00H	00H

**1: Set at the factory.*

**2: Set when the EEPROM is initialized from the control panel.*

**3: BUSY signal delay time from the falling edge of an /STB signal.*
(Fast: maximum 1MB/s, Slow: maximum 600KB/s)

**4: Select IEEE-1284 transfer mode (ECP or Nibble).*

**5: Enable or disable reverse transfer. (When disabled, ignore /SLIN signal.)*

A.5 Circuit Board Component Layouts

This section contains the following circuit board component layouts:

- C206MAIN-B (Stylus COLOR 440)
- C256MAIN (Stylus COLOR 640)
- C257MAIN (Stylus COLOR 740)
- C206PSB/PSE (Stylus COLOR 440/640)
- C257PSB/PSE (Stylus COLOR 740)
- C206PNL (Stylus COLOR 440/640)
- C209PNL (Stylus Color 740)

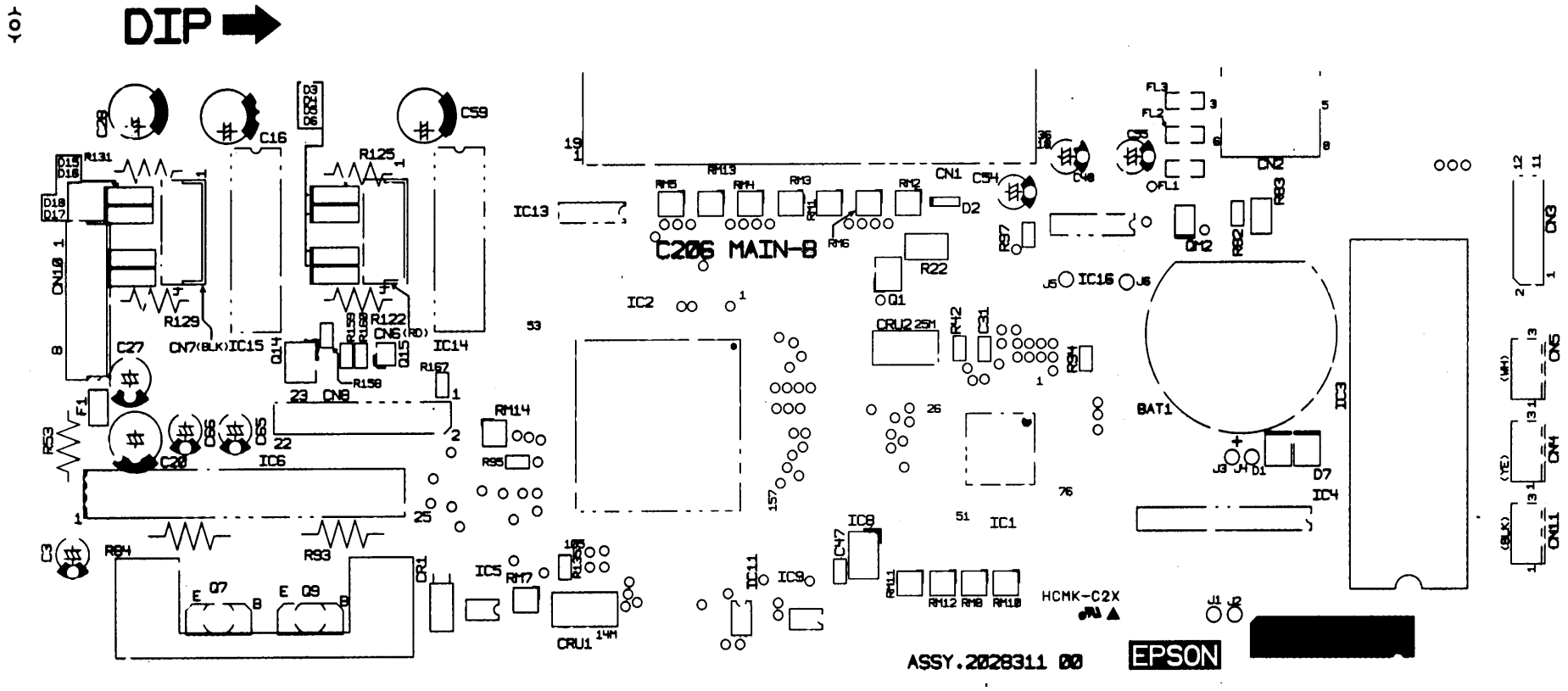


Figure A-4. C206MAIN-B Board Component Layout (1/2) (Stylus COLOR 440)

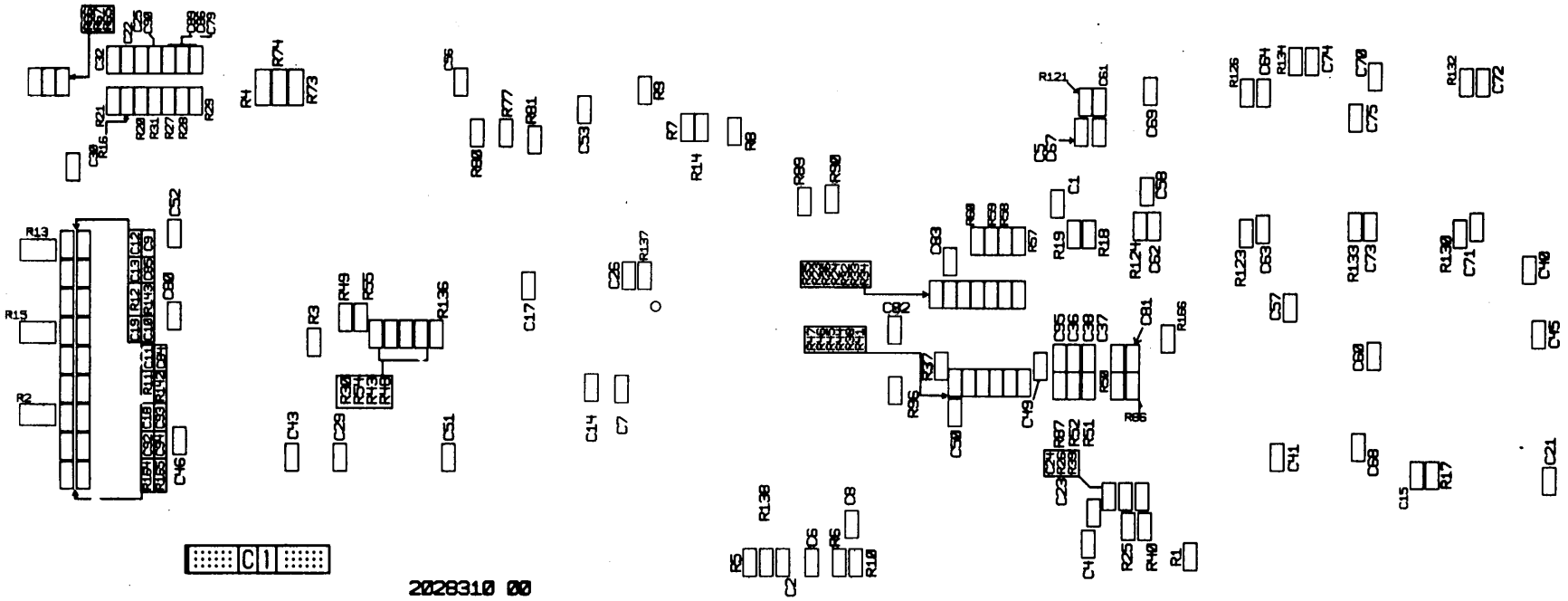


Figure A-5. C206MAIN-B Board Component Layout (2/2) (Stylus COLOR 440)

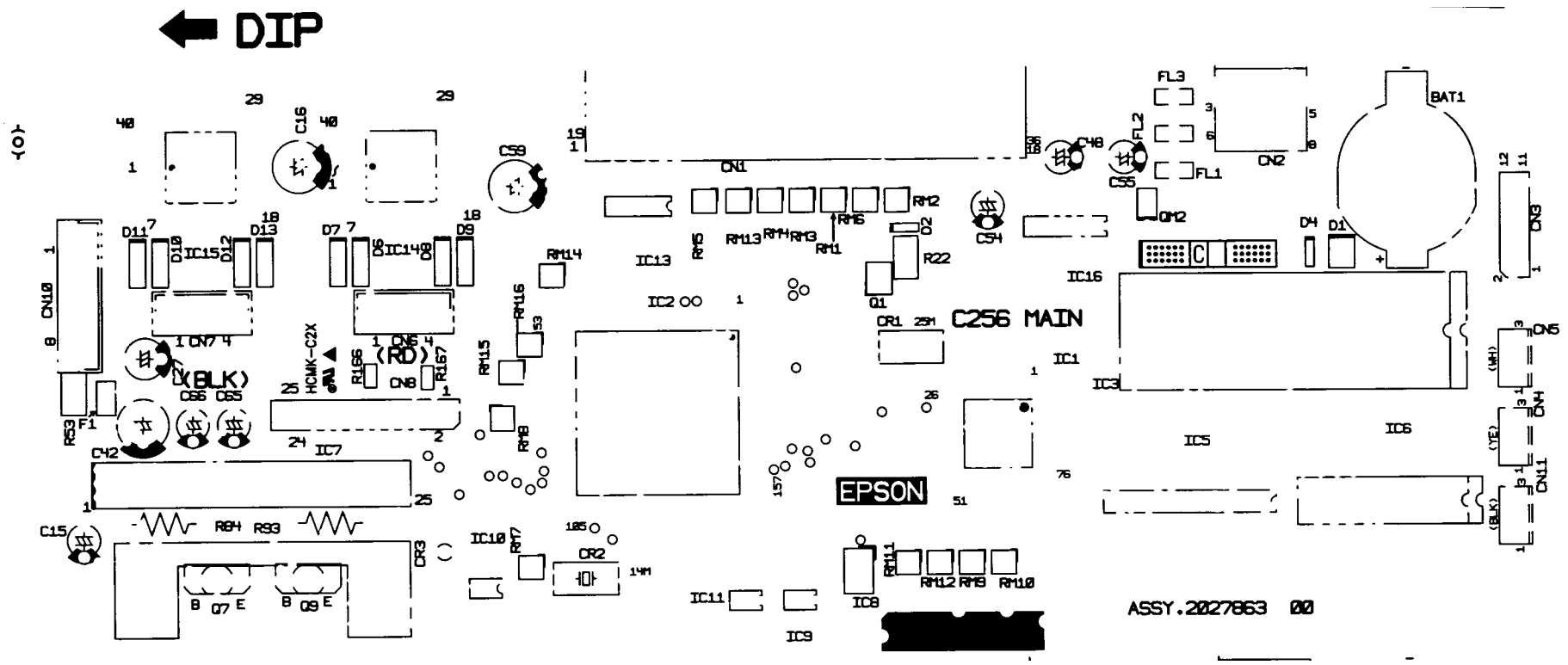


Figure A-6. C256MAIN Board Component Layout (1/2) (Stylus COLOR 640)

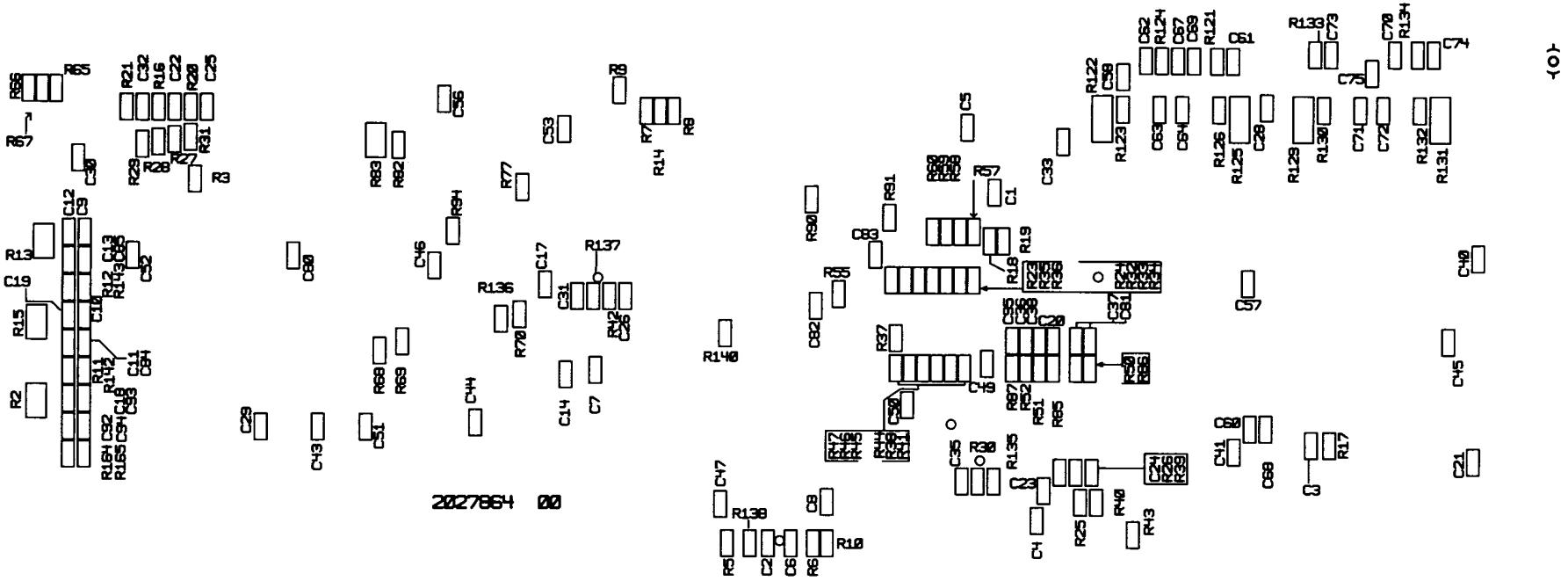


Figure A-7. C256MAIN Board Component Layout (2/2) (Stylus COLOR 640)

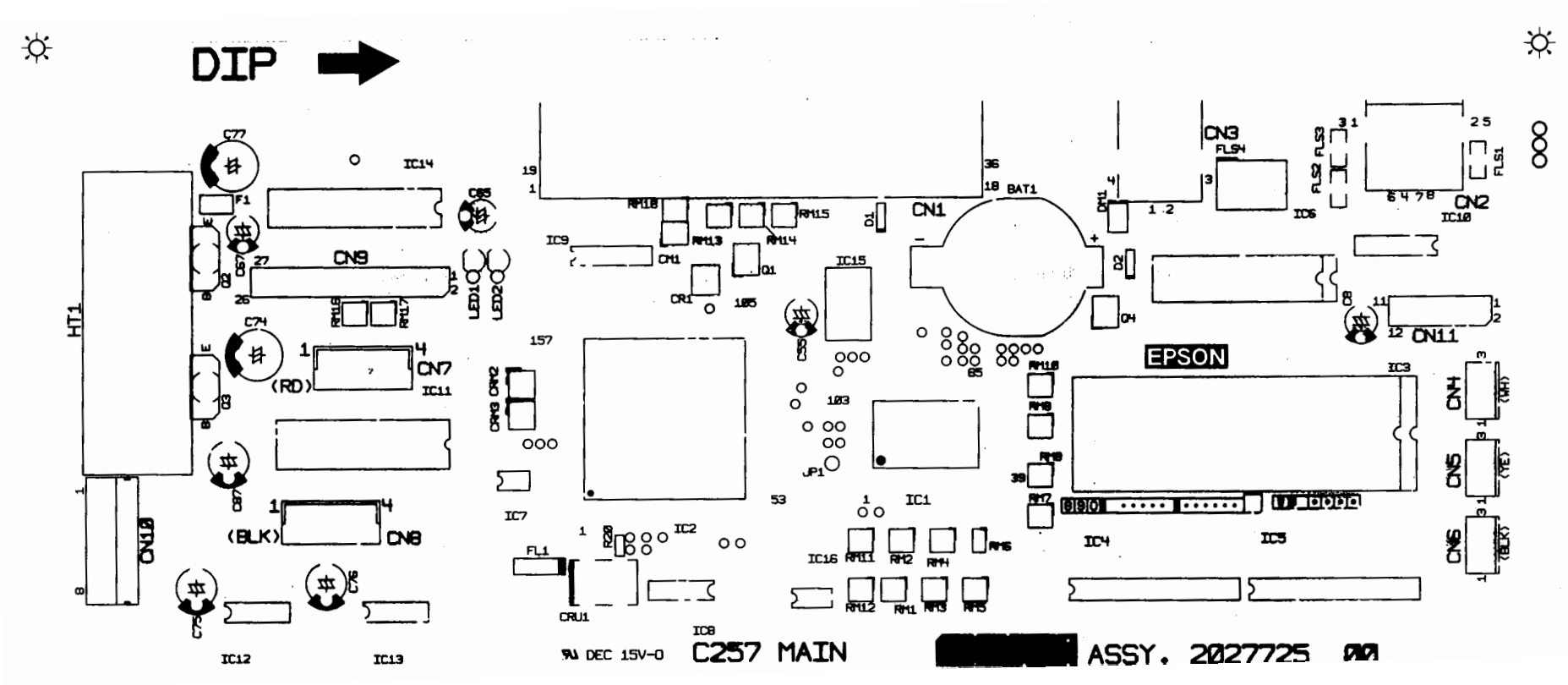


Figure A-8. C257MAIN Board Component Layout (1/2) (Stylus COLOR 740)

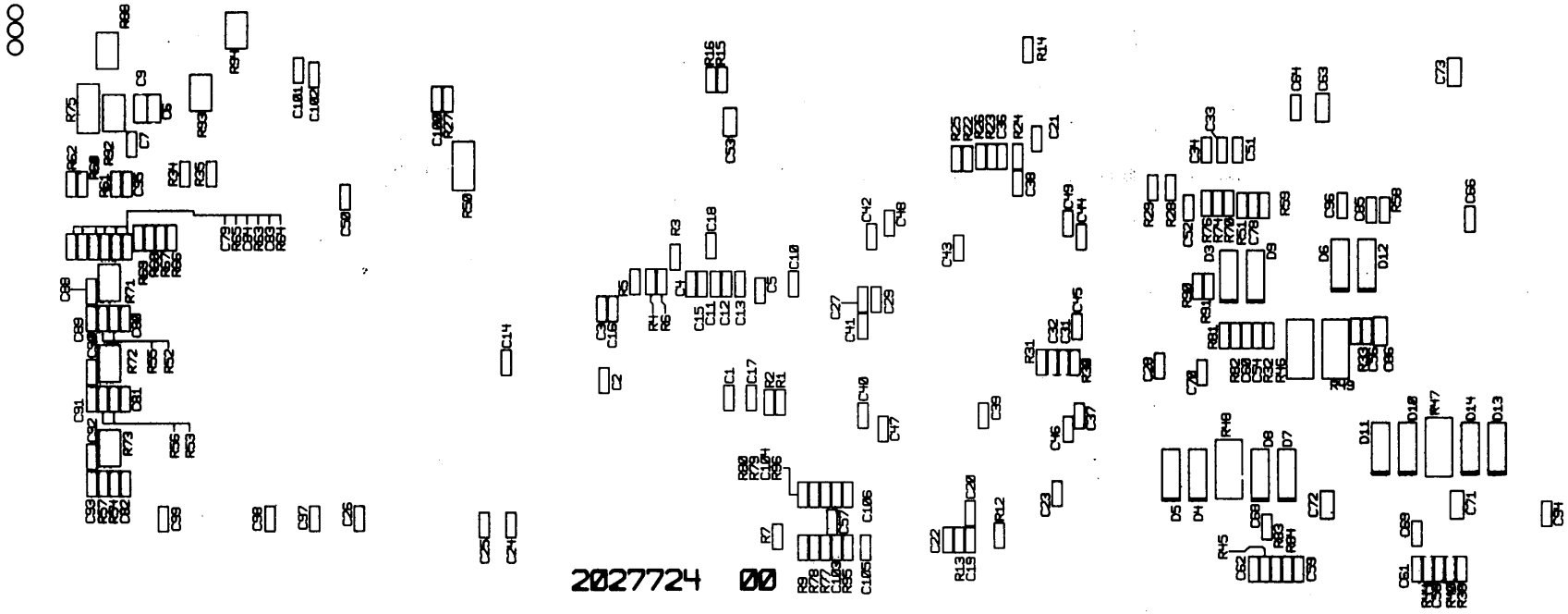


Figure A-9. C257MAIN Board Component Layout (2/2) (Stylus COLOR 740)

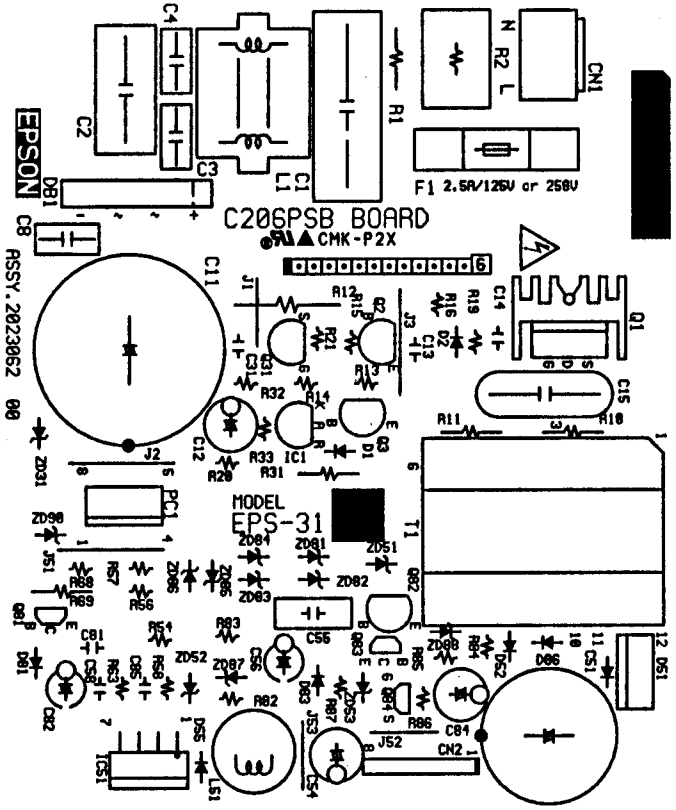


Figure A-10.
C206PSB Board Component Layout (Stylus COLOR 440 and 640)

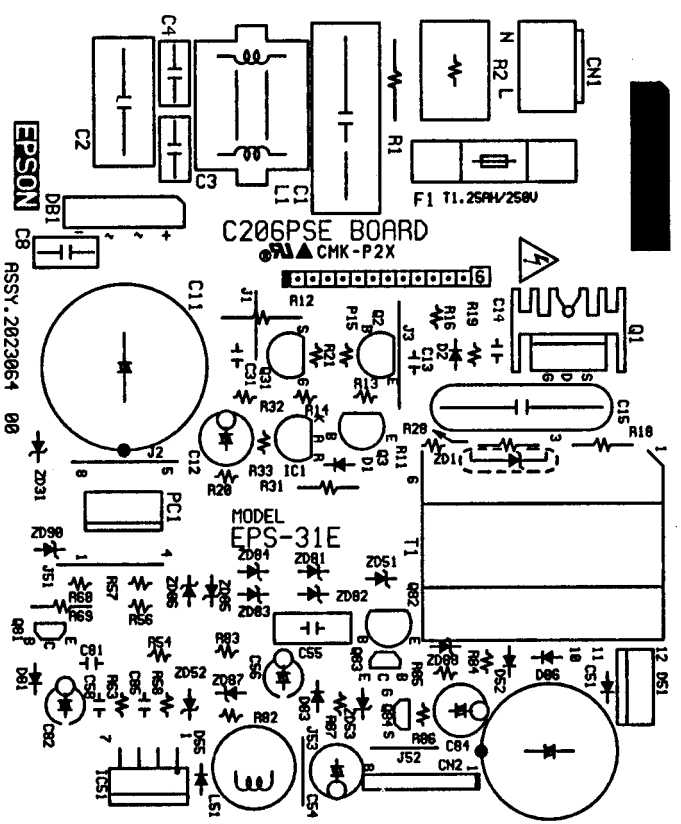


Figure A-11.
C206PSE Board Component Layout (Stylus COLOR 440 and 640)

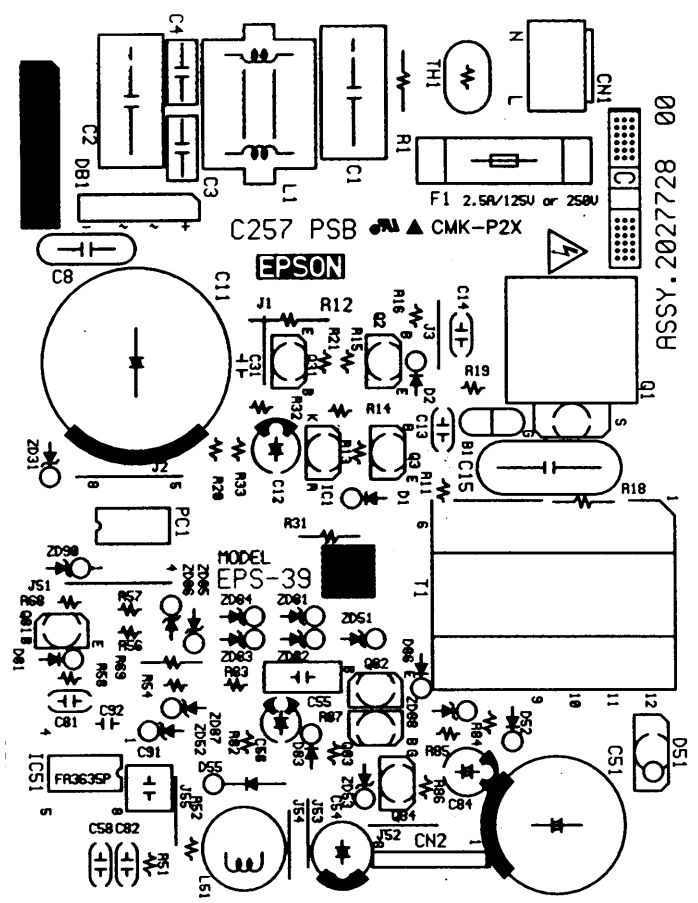


Figure A-12.
C257 PSB Board Component Layout (Stylus COLOR 740)

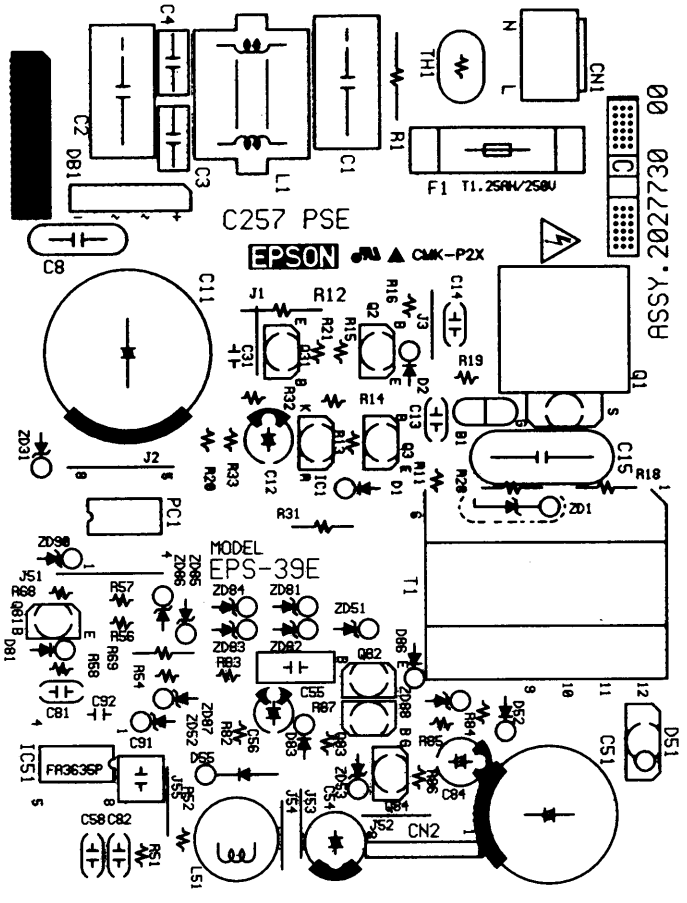


Figure A-13.
C257 PSE Board Component Layout (Stylus COLOR 740)

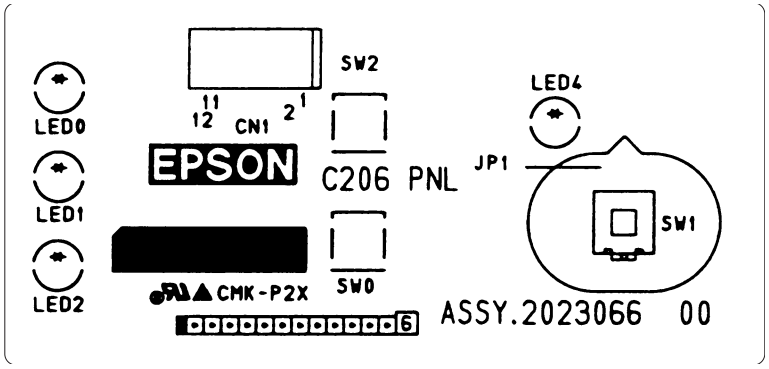


Figure A-14. C206PNL Component Layout

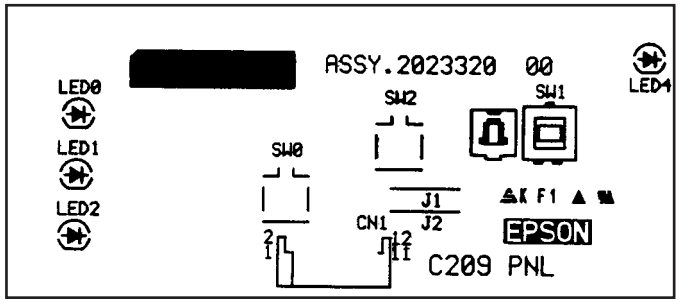
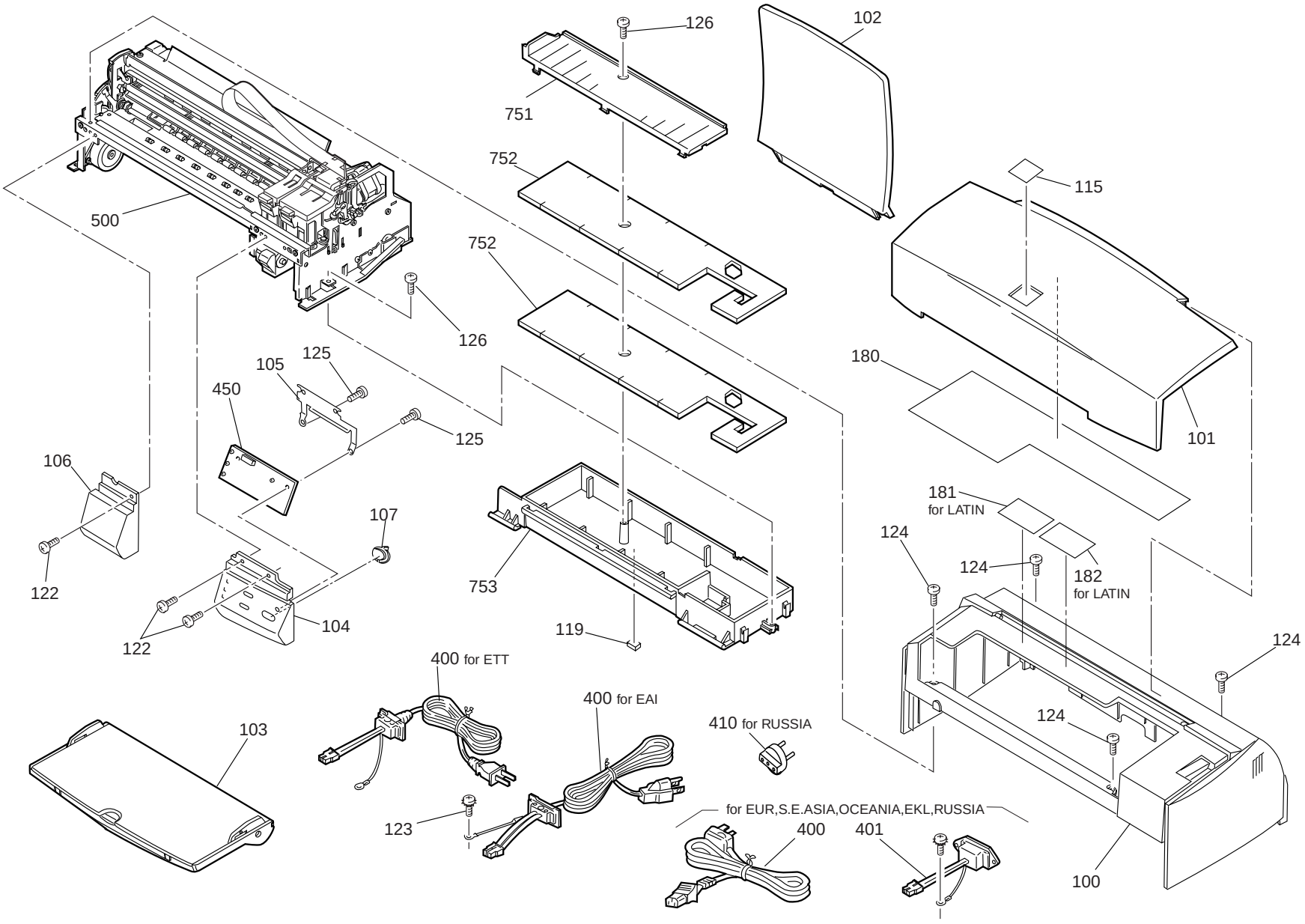


Figure A-15. C209PNL Component Layout

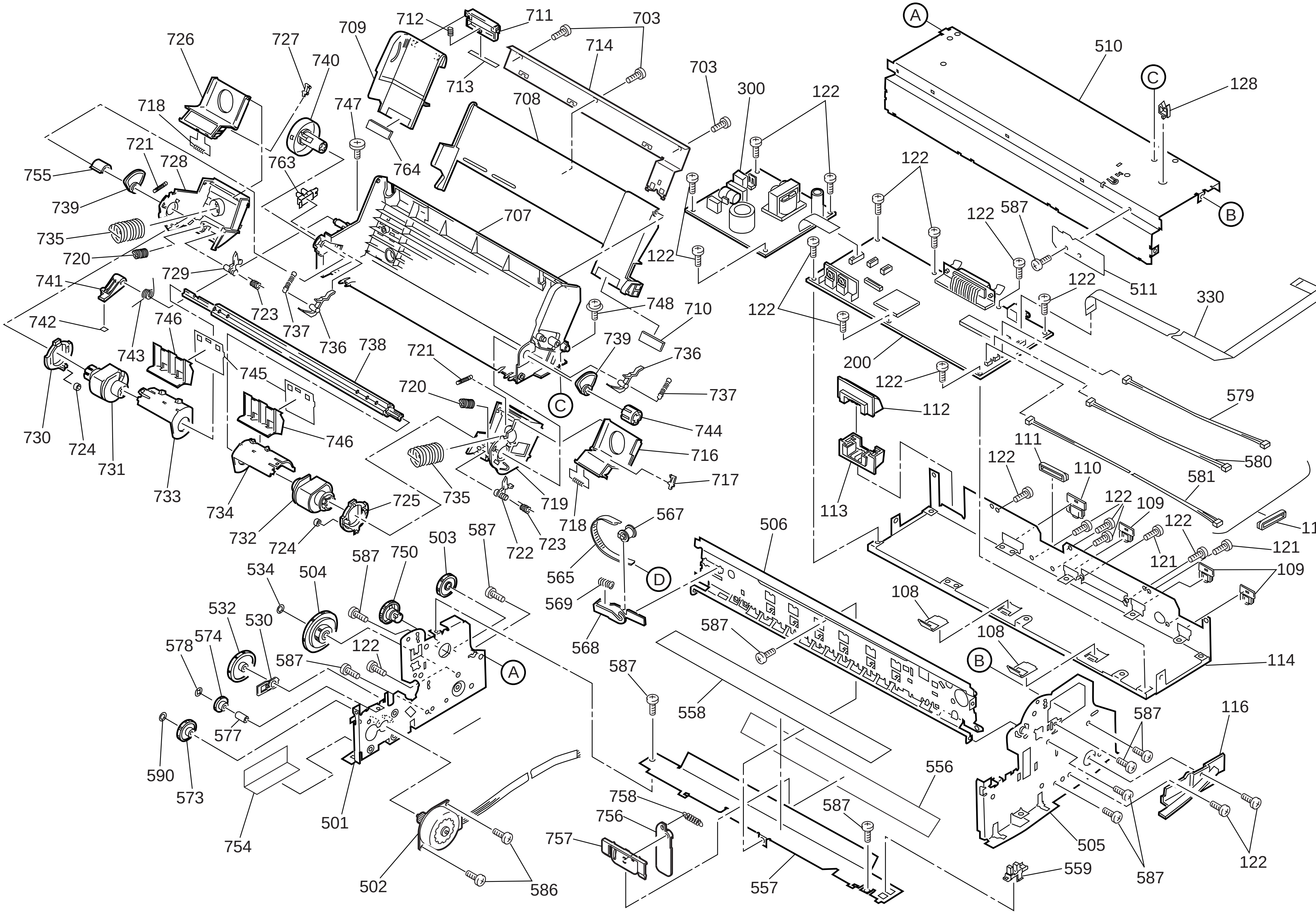
A.6 Exploded Diagrams

This section contains the following exploded diagrams:

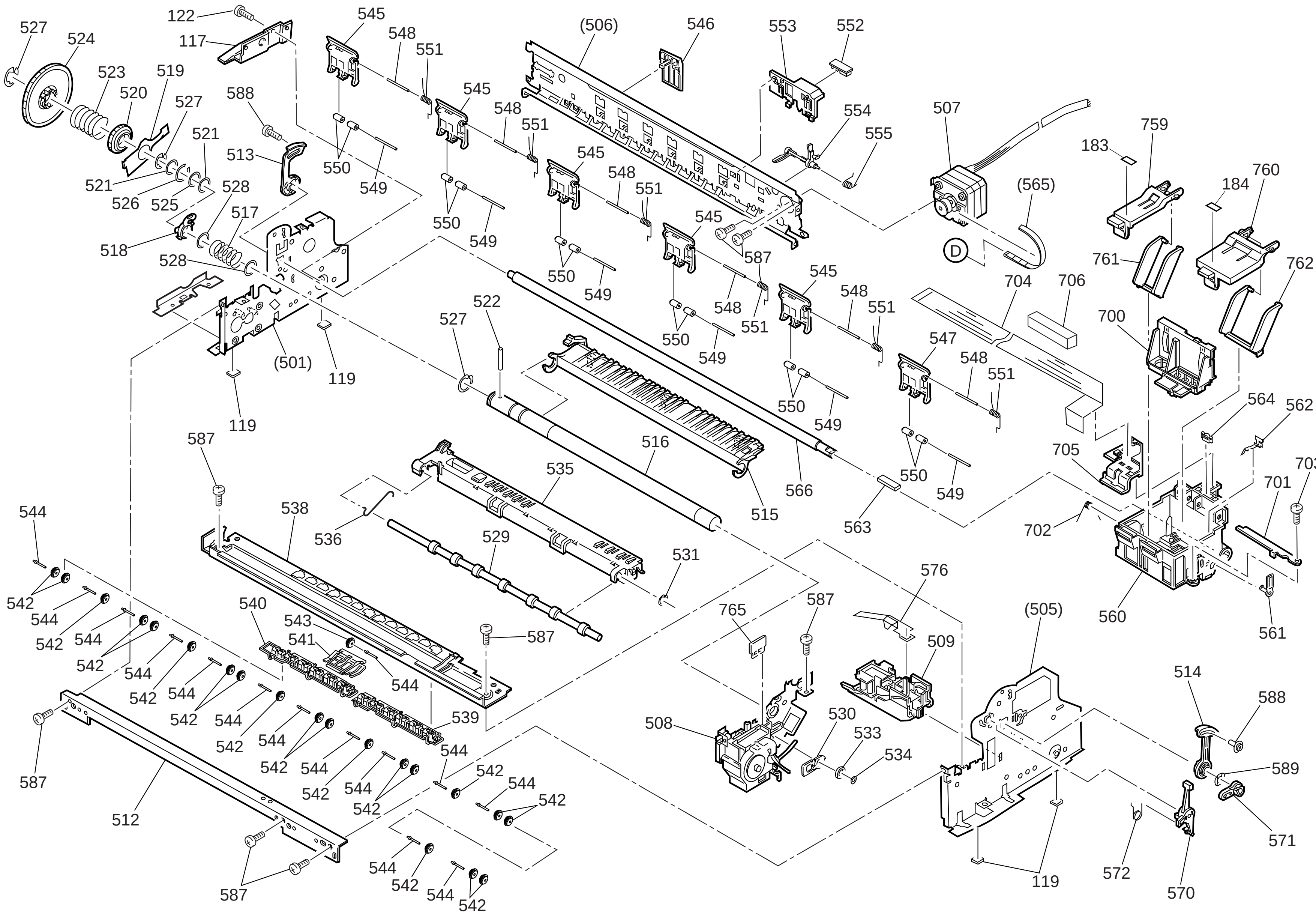
- Exploded diagrams for the Stylus COLOR 440
- Exploded diagrams for the Stylus COLOR 640
- Exploded diagrams for the Stylus COLOR 740



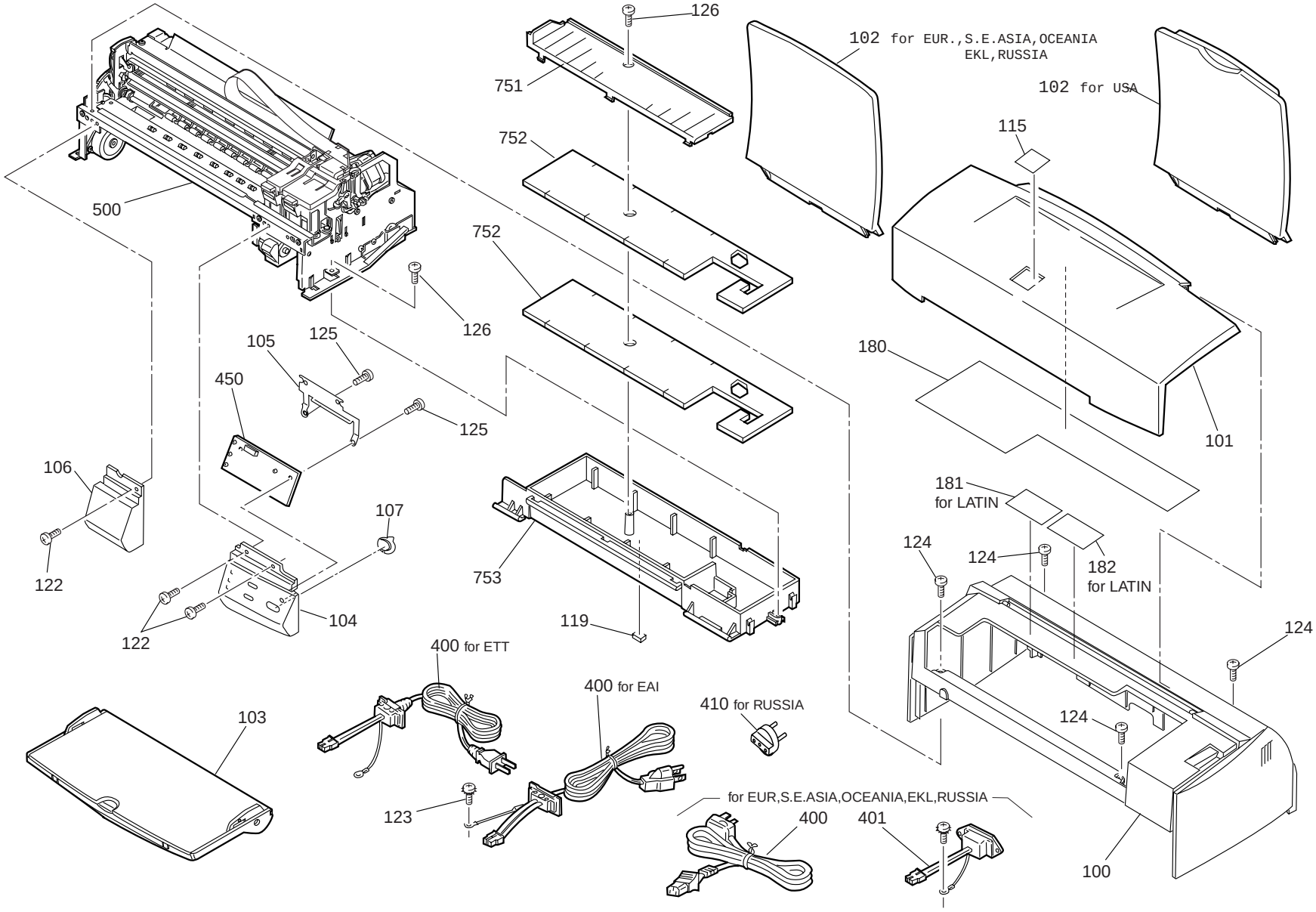
EXPLODED DIAGRAM FOR EPSON STYLUS COLOR 440 (1/3) REV.1.0 10001



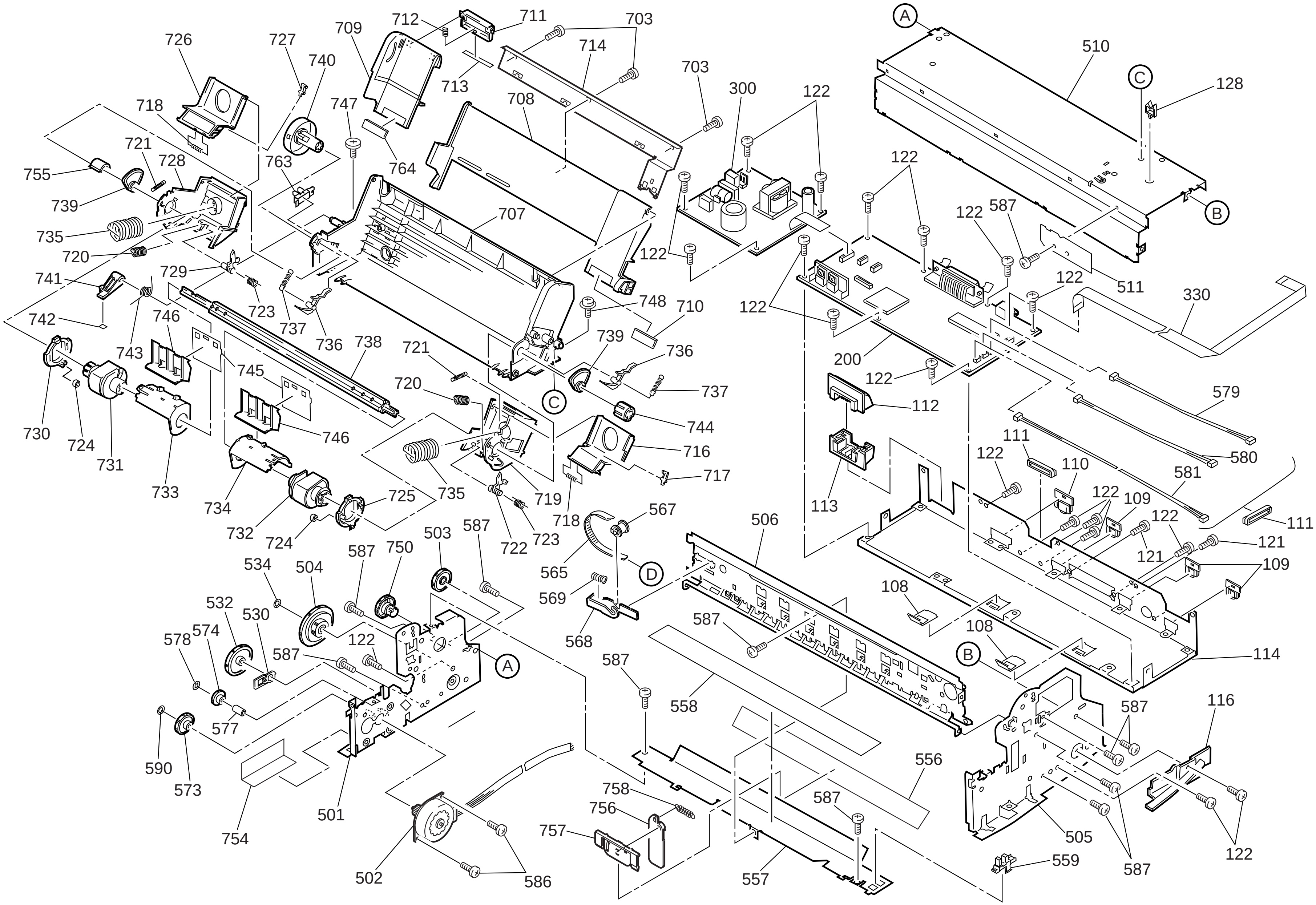
EXPLODED DIAGRAM FOR EPSON STYLUS COLOR 440 (2/3) REV.1.0 10001



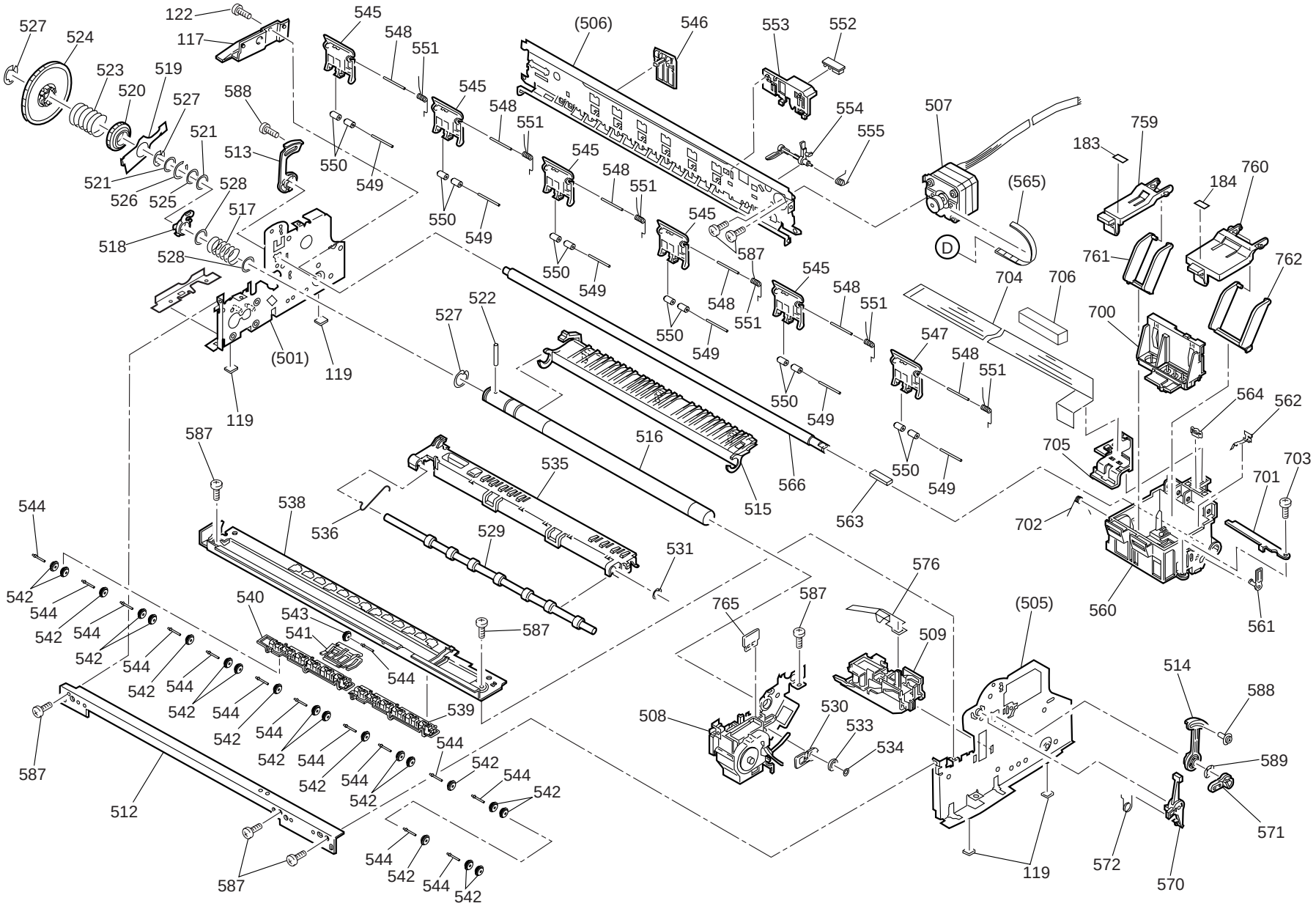
EXPLODED DIAGRAM FOR EPSON STYLUS COLOR 440 (3/3) REV.1.0 10001



EXPLODED DIAGRAM FOR EPSON STYLUS COLOR 640 (1/3) REV.1.0 10002



EXPLODED DIAGRAM FOR EPSON STYLUS COLOR 640 (2/3) REV.1.0 10002



EXPLODED DIAGRAM FOR EPSON STYLUS COLOR 640 (3/3) REV.1.0 10002

Table A-27. Parts List for the Stylus COLOR 440 and 640

Part #	Parts Price List Description	Common Name
100	Housing; B	
101	Cover, Printer; B	
102	Paper Support; B	
103	Stacker Assembly; B	Paper Output Tray
104	Panel Assembly, Right; B	
105	Shield Plate, Panel	
106	Housing, Panel, Left; B	
107	Button, P/S; B	
108	Grounding Plate	
109	Cover, Shield Plate, M/B, Right	
110	Cover, Shield Plate, M/B, Left	
111	Cover, Cable	Cable Holder
112	Cover, Inlet, Upper; B	
113	Cover, Inlet, Lower; B	
114	Shield Plate, M/B; C	
115	Logo Plate	
116	Housing, Sub, Right; B	
117	Housing Sub, Left; B	
119	Foot	
121	CP Screw, M3 × 6	
122	CBS-Tite Screw, M3 × 6	
123	CB(O) Screw, 4 × 5, F/Zg	
124	CBS-Tite Screw, M3 × 10	
125	CBP-Tite Screw, M3 × 8, F/Zn	
126	CBP-Tite Screw, M3 × 10, F/Zn	
128	Mini Clamp	Cable Hook
180	Label, Caution 1; B	
181	Label, Accessory B	
182	Label, Accessry C	
183	Label, Lever Cartridge, Black	
184	Label, Lever Cartridge, Color	

Table A-27. Parts List for the Stylus COLOR 440 and 640 (continued)

Part #	Parts Price List Description	Common Name
200	Board Assembly, Main	
300	Board Assembly, Power Supply	
330	Harness	
400	Power Cable Assembly	
450	Board Assembly, Panel	
500	Printer Mechanism	
501	Frame Assembly, Left	
502	Motor Assembly, PF	Paper Feed (PF) Motor
503	Spur Gear, 23.2	
504	Combination Gear, 16, 40.8	
505	Frame, Right	
506	Frame, Top	
507	Motor Assembly, CR	Carriage (CR) Motor
508	Pump Assembly	
509	Cap Assembly	Capping Mechanism
510	Frame, Bottom	
511	Sheet, Protection, Head	
512	Frame, Front	
513	Bushing, Parallelism Adjustment, Left	Left Parallelism Adjustment Bushing
514	Bushing, Parallelism Adjustment, Right	Right Parallelism Adjustment Bushing
515	Paper Guide, Rear	
516	Roller, PF	Paper Feed (PF) Roller
517	Compression Spring, 5.85	
518	Bushing, 12, Left	
519	Lever, Change	
520	Spur Gear, 26.4	
521	Spacer, C-ring	
522	Scallop Sp-AW, 2 × 16, F/B	
523	Compression Spring, 0.9	
524	Spur Gear, 67.2	

Table A-27. Parts List for the Stylus COLOR 440 and 640 (continued)

Part #	Parts Price List Description	Common Name
525	Spacer, Fixing, Roller, PF	
526	Spacer, Fixing, Roller, PF; B	
527	Crescent Ring	
528	Plain Washer 12.2 × 0.5 × 15	
529	Roller Assembly, Paper Eject	
530	Bushing, 6	
531	Retaining Ring, Type-E (4)	
532	Spur Gear, 36	
533	Spur Gear, 11	
534	Plain Washer, 4.1 × 0.5 × 6.5	
535	Paper Guide, Front	Platen
536	Grounding Spring, Paper Eject	
538	Frame, Paper Eject	
539	Holder, Star Wheel, Right	
540	Holder, Star Wheel, Left	
541	Holder, Star Wheel, Front	
542	Star Wheel Assembly, 8 (Natural)	
543	Star Wheel 8; B	
544	Bar Spring, Star Wheel	
545	Paper Guide, Upper	Pinch Roller Assembly
546	Paper Guide, Right	
547	Paper Guide, Left	
548	Shaft, Paper Guide, Upper	
549	Shaft, Roller, Driven	
550	Roller, Driven; D	
551	Torsion Spring, 117.6	
552	Board Assembly, PE	Paper End (PE) Sensor
553	Holder, PE	Paper End (PE) Sensor Support
554	Lever, PE	
555	Torsion Spring, 0.22	
556	Sheet, Guide Plate, Cable	

Table A-27. Parts List for the Stylus COLOR 440 and 640 (continued)

Part #	Parts Price List Description	Common Name
557	Guide Plate, Cable	
558	Sheet, Cable	
559	Detector, HP	Carriage Home Position (HP) Sensor
560	Carriage Assembly	
561	Lever, Adjust	Head Angle Adjusting Lever
562	Grouding Plate, Head	
563	Oil Pad	
564	Slider, CR	
565	Timing Belt	
566	Shaft, CR, Guide	Carriage (CR) Guide Shaft
567	Pulley Assembly, Driven	Tensioning Pulley
568	Holder, Pulley, Driven	Pulley Holder
569	Compression Spring, 19.6	
570	Lever, PG	
571	Lever, PG, Sub	
572	Torsion Spring, 63.7	
573	Combination Spring, 6, 34.4	
574	Combination Spring, 8, 30	
576	Absorber, Slider, Cap	
577	Bushing, Fixing, Combination Gear	
578	Push Nut, 2	
579	Harness, HP	
580	Harness, PE	
581	Harness, ASF	
586	CBS-Tite Screw	
587	CBS-Tite Screw, M3 × 6	
588	CBS-Tite (P4) Screw, 3 × 6, F/Zn	
589	Leaf Spring, 6.2 × 0.15 × 11	
590	Plain Washer, 2.6 × 0.5 × 8	
700	Printhead	

Table A-27. Parts List for the Stylus COLOR 440 and 640 (continued)

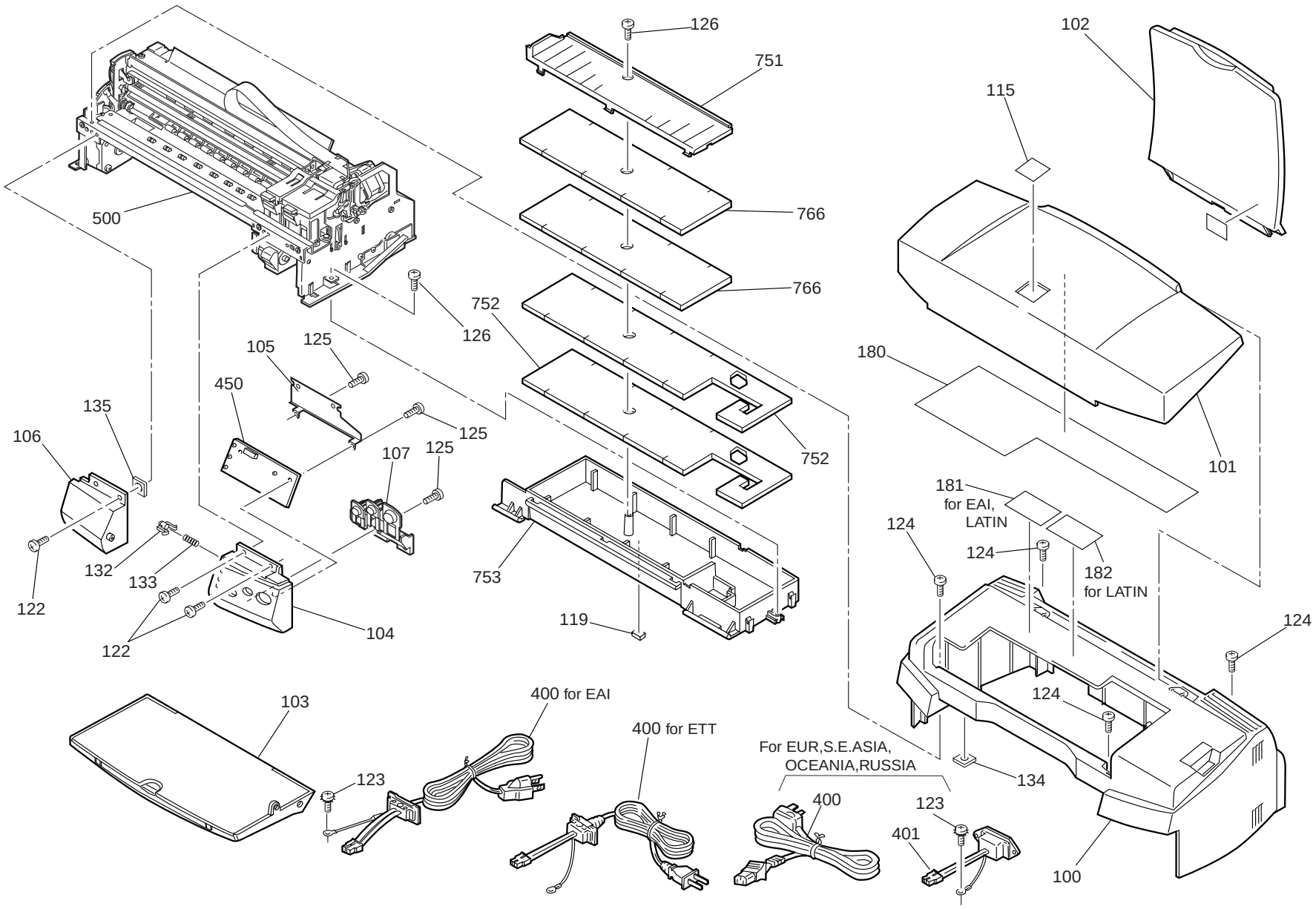
Part #	Parts Price List Description	Common Name
701	Fastener, Head	Printhead (PH) Fastener
702	Torsion Spring, 49	
703	CBP-Tite Screw, 3 × 6, F/Zn	Printhead (PH) Securing Screw
704	Cable, Head	
705	Holder, Cable	
706	Spacer, Cable Head	
707	Frame, ASF; B	Auto Sheet Feeder (ASF) Frame
708	Hopper	
709	Edge Guide	
710	Cork	
711	Slider, Edge Guide	
712	Compression Spring, 3.23	
713	Pad, Brake, Edge Guide	
714	Reinforcing Plate, Hopper	
716	Pad Assy., Right	
717	Lever, Pad, Release, Right	
718	Bar Spring, Holder, Pad	
719	Holder, Edge Guide, Right	
720	Compression Spring, 1.17	
721	Tension Spring, 0.62	
722	Lever, Paper Return, Right	
723	Tension Spring, 0.294	
724	Roller, LD, Sub	
725	Holder, Roller, LD, Sub, Right	

Table A-27. Parts List for the Stylus COLOR 440 and 640 (continued)

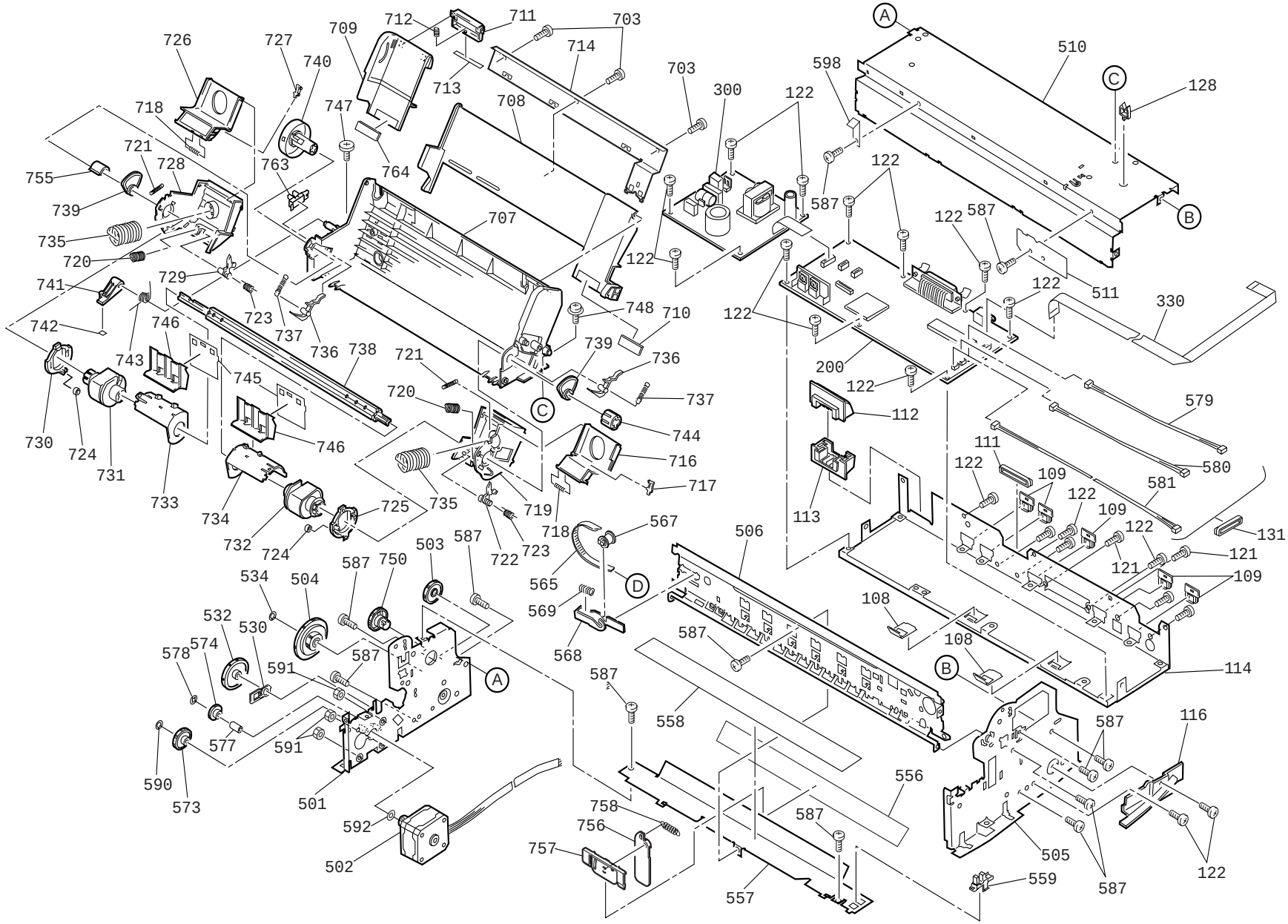
Part #	Parts Price List Description	Common Name
726	Pad Assy., Left	
727	Lever, Pad, Release, Left	
728	Holder, Edge Guide, Left	
729	Lever, Paper Return, Left	
730	Holder, Roller, LD, Sub, Left	
731	Roller Assy., LD, Left	Left Paper Feed (PF) Roller
732	Roller Assy., LD, Right	Right Paper Feed (PF) Roller
733	Cover, Roller, LD, Left	Left Roller Cover
734	Cover, Roller, LD, Right	Right Roller Cover
735	Compression Spring, 1.961	
736	Lever, Fixing, Edge Guide; B	
737	Tension Spring, 0.088	
738	Shaft, Roller, LD	
739	Lever, Hopper, Release	Hopper Release Cam
740	Wheel, Detection	Opto-interrupter Wheel
741	Lever, Brake	
742	Pad, Brake	
743	Torsion Spring, 41.2	
744	Bushing, Fixing, Shaft	Shaft Fixing Clip
745	Sheet, Paper Feed	
746	Holder, Sheet, Paper Feed	
747	Shaft, Mouting, CR	
748	CBS (P4) Screw, 3 × 6, F/Zn	
750	Spur Gear, 34	

Table A-27. Parts List for the Stylus COLOR 440 and 640 (continued)

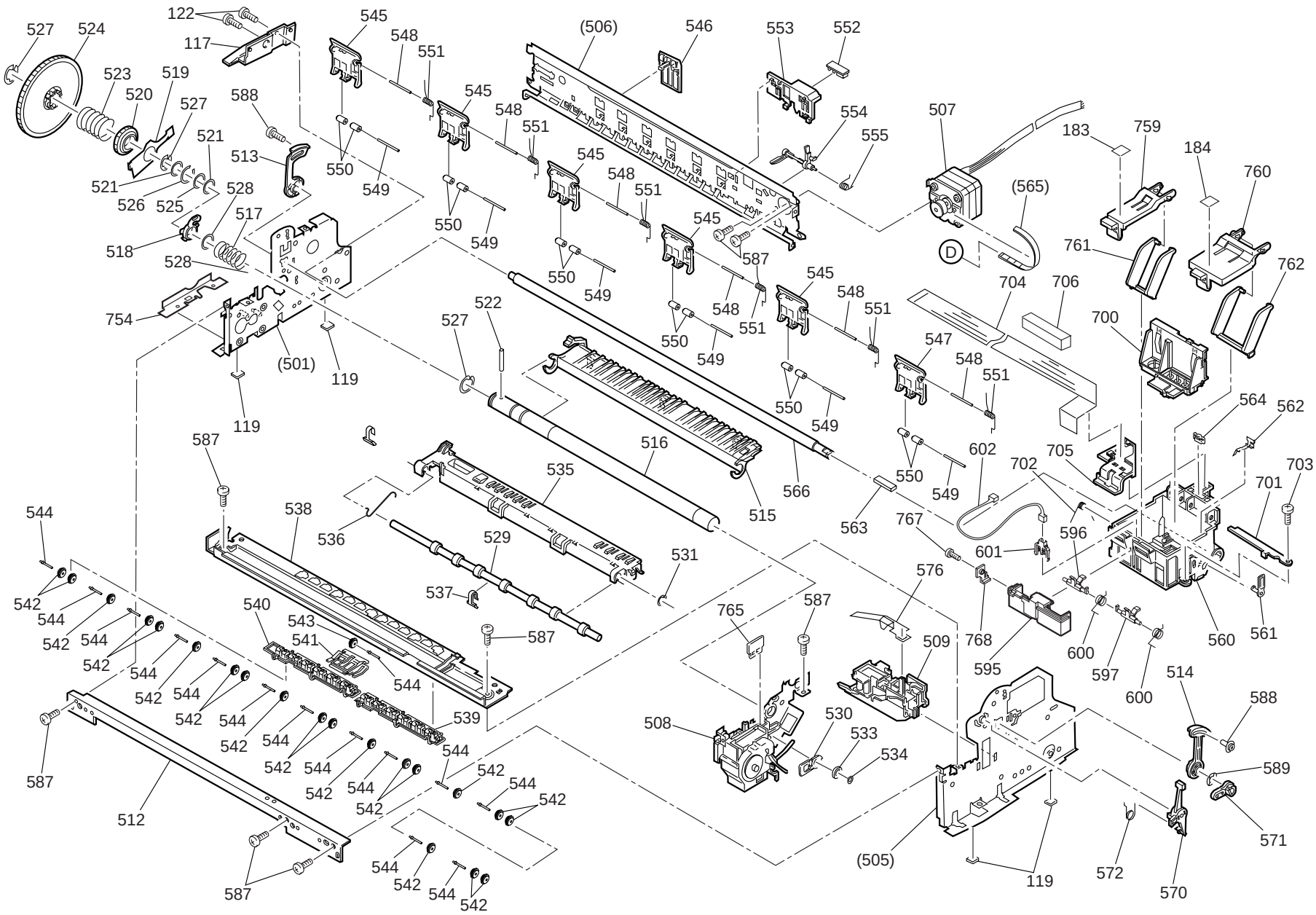
Part #	Parts Price List Description	Common Name
751	Paper Guide, Lower	
752	Absorber, Waste Ink, Large	Waste Ink Pad
753	Tray, Absorber	
754	Spacer, Tray	Locking Plate (for Waste Ink Pad)
755	Bushing, Fixing, Shaft, Left	
756	Paper Support, Sub, Upper	
757	Holder, Paper Support, Sub, Upper	
758	Torsion Spring, 0.29	
759	Cover, Cartridge, Bk	Ink Cartridge Clamp (Black)
760	Cover, Cartridge, C; B	Ink Cartridge Clamp (Color)
761	Separator, Cartridge, Bk	
762	Separator, Cartridge, C	
763	Detector, HP	ASF Home Position Sensor
764	Cork; B	
765	Cleaner, Head, ASP	Printhead Cleaning Blade



EXPLODED DIAGRAM FOR EPSON STYLUS COLOR 740 (1/3) Rev.01 10004



EXPLODED DIAGRAM FOR EPSON STYLUS COLOR 740 (2/3) Rev.01 10004



EXPLODED DIAGRAM FOR EPSON STYLUS COLOR 740 (3/3) Rev.01 10004

Table A-28. Parts List for the Stylus COLOR 740

Part #	Parts Price List Description	Common Name
100	Housing	
101	Cover, Printer	
102	Paper Support Assembly	
103	Stacker Assembly	Paper Output Tray
104	Panel Assembly	
105	Shield Plate, Panel	
106	Housing, Panel, Left	
107	Button, P/S; B	
108	Groundign Plate	
109	Cover, Shield Plate, M/B, Right	
111	Cover, Cable	Cable Holder
112	Cover, Inlet, Upper; B	
113	Cover, Inlet, Lower; B	
114	Shiled Plate, M/B	
115	Logo Plate	
116	Housing, Sub, Right; B	
117	Housing Sub, Left; B	
119	Foot	
121	CP Screw, M3 × 6	
122	CBS-Tite Screw, M3 × 6	
123	CB(O) Screw, 4 × 5, F/Zg	
124	CBS-Tite Screw, M3 × 10	
125	CBP-Tite Screw, M3 × 8, F/Zn	
126	CBP-Tite Screw, M3 × 10, F/Zn	
128	Mini Clamp	Cable Hook
131	Cover, Cable; B	
132	Lock, Stacker	
133	Compression Spring, 2.94	
134	Spacer, Housing	
135	Spacer, Housing, Panel	
180	Label, Caution 1	
181	Label, Accessory	

Table A-28. Parts List for the Stylus COLOR 740 (continued)

Part #	Parts Price List Description	Common Name
183	Label, Lever Cartridge, Black	
184	Label, Lever Cartridge, Color	
200	Board Assembly, Main	
300	Board Assembly, Power Supply	
330	Harness	
400	Power Cable Assembly	
450	Board Assembly, Panel	
500	Printer Mechanism	
501	Frame Assembly, Left	
502	Motor Assembly, PF	Paper Feed (PF) Motor
503	Spur Gear, 23.2	
504	Combination Gear, 16, 40.8	
505	Frame, Right	
506	Frame, Top	
507	Motor Assembly, CR	Carriage (CR) Motor
508	Pump Assembly	
509	Cap Assembly	Capping Mechanism
510	Frame, Bottom	
511	Sheet, Protection, Head	
512	Frame, Front	
513	Bushing, Parallelism Adjustment, Left	Left Parallelism Adjustment Bushing
514	Bushing, Parallelism Adjustment, Right	Right Parallelism Adjustment Bushing
515	Paper Guide, Rear	
516	Roller, PF	Paper Feed (PF) Roller
517	Compression Spring, 5.85	
518	Bushing, 12, Left	
519	Lever, Change	
520	Spur Gear, 26.4	
521	Spacer, C-ring	
522	Scallop Sp-AW, 2 × 16, F/B	
523	Compression Spring, 0.9	

Table A-28. Parts List for the Stylus COLOR 740 (continued)

Part #	Parts Price List Description	Common Name
524	Spur Gear, 73.6	
525	Spacer, Fixing, Roller, PF	
526	Spacer, Fixing, Roller, PF; B	
527	Crescent Ring	
528	Plain Washer, 12.2 × 0.5 × 15	
529	Roller Assembly, Paper Eject	
530	Bushing, 6	
531	Retaining Ring, Type-E (4)	
532	Spur Gear, 36	
533	Spur Gear, 11	
534	Plain Washer, 4.1 × 0.5 × 6.5	
535	Paper Guide, Front	Platen
536	Grounding Spring, Paper Eject	
537	Guide, Paper Eject	
538	Frame, Paper Eject	
539	Holder, Star Wheel, Right	
540	Holder, Star Wheel, Left	
541	Holder, Star Wheel, Front	
542	Star Wheel Assembly, 8 (Natural)	
543	Star Wheel 8; B	
544	Bar Spring, Star Wheel	
545	Paper Guide, Upper	Pinch Roller Assembly
546	Paper Guide, Right	
547	Paper Guide, Left	
548	Shaft, Paper Guide, Upper	
549	Shaft, Roller, Driven	
550	Roller, Driven; D	
551	Torsion Spring, 117.6	
552	Board Assembly, PE	Paper End (PE) Sensor
553	Holder, PE	Paper End (PE) Sensor Support
554	Lever, PE	
555	Torsion Spring, 0.22	

Table A-28. Parts List for the Stylus COLOR 740 (continued)

Part #	Parts Price List Description	Common Name
556	Sheet, Guide Plate, Cable	
557	Guide Plate, Cable	
558	Sheet, Cable	
559	Detector, HP	Carriage Home Position (HP) Sensor
560	Carriage Assembly	
561	Lever, Adjust	Head Angle Adjusting Lever
562	Grouding Plate, Head	
563	Oil Pad	
564	Slider, CR	
565	Timing Belt	
566	Shaft, CR, Guide	Carriage (CR) Guide Shaft
567	Pulley Assembly, Driven	Tensioning Pulley
568	Holder, Pulley, Driven; B	Pulley Holder
569	Compression Spring, 19.6	
570	Lever, PG	
571	Lever, PG, Sub	
572	Torsion Spring, 63.7	
573	Combination Spring, 12.4, 28	
574	Combination Spring, 16, 21.6	
576	Absorber, Slider, Cap	
577	Bushing, Fixing, Combination Gear	
578	Push Nut, 2	
579	Harness, HP	
580	Harness, PE	
581	Harness, ASF	
586	CBS-Tite Screw	
587	CBS-Tite Screw, M3 × 6	
588	CBS-Tite (P4) Screw, 3 × 6, F/Zn	
589	Leaf Spring, 6.2 × 0.15 × 11	
590	Plain Washer, 6.1 × 0.5 × 9.0	
591	6N, Class 2, M3	

Table A-28. Parts List for the Stylus COLOR 740 (continued)

Part #	Parts Price List Description	Common Name
592	Plain Washer, 3 × 0.3 × 7	
595	Holder, Detector, I/C	
596	Lever, Detector, I/C, Bk	
597	Lever, Detector, I/C, CL	
598	Grounding Plate, Roller, PF	
600	Torsion Spring, 1.08	
601	Detector, I/C	
602	Harness, I/C	
700	Printehead	
701	Fastener, Head	Printhead (PH) Fastener
702	Torsion Spring, 49	
703	CBP-Tite Screw, 3 × 6, F/Zn	Printhead Securing Screw
704	Cable, Head	
705	Holder, Cable	
706	Spacer, Cable Head	
707	Frame, ASF; B	Auto Sheet Feeder (ASF) Frame
708	Hopper	
709	Edge Guide	
710	Cork	
711	Slider, Edge Guide	
712	Compression Spring, 3.23	
713	Pad, Brake, Edge Guide	
714	Reinforcing Plate, Hopper	
716	Pad Assy., Right	
717	Lever, Pad, Release, Right	
718	Bar Spring, Holder, Pad	
719	Holder, Edge Guide, Right	
720	Compression Spring, 1.17	
721	Tension Spring, 0.62	
722	Lever, Paper Return, Right	
723	Tension Spring, 0.294	
724	Roller, LD, Sub	

Table A-28. Parts List for the Stylus COLOR 740 (continued)

Part #	Parts Price List Description	Common Name
725	Holder, Roller, LD, Sub, Right	
726	Pad Assembly, Left	
727	Lever, Pad, Release, Left	
728	Holder, Edge Guide, Left	
729	Lever, Paper Return, Left	
730	Holder, Roller, LD, Sub, Left	
731	Roller Assy., LD, Left	Left Paper Feed (PF) Roller
732	Roller Assy., LD, Right	Right Paper Feed (PF) Roller
733	Cover, Roller, LD, Left	Left Roller Cover
734	Cover, Roller, LD, Right	Right Roller Cover
735	Compression Spring, 1.961	
736	Lever, Fixing, Edge Guide; B	
737	Tension Spring, 0.088	
738	Shaft, Roller, LD	
739	Lever, Hopper, Release	Hopper Release Cam
740	Wheel, Detection	Opto-interrupter Wheel
741	Lever, Brake	
742	Pad, Brake	
743	Torsion Spring, 41.2	
744	Bushing, Fixing, Shaft	Shaft Fixing Clip
745	Sheet, Paper Feed	
746	Holder, Sheet, Paper Feed	
747	Shaft, Mouting, CR	
748	CBS (P4) Screw, 3 × 6, F/Zn	
750	Spur Gear, 34	
751	Paper Guide, Lower	
752	Absorber, Waste Ink, Large	Waste Ink Pad
753	Tray, Absorber	

Table A-28. Parts List for the Stylus COLOR 740 (continued)

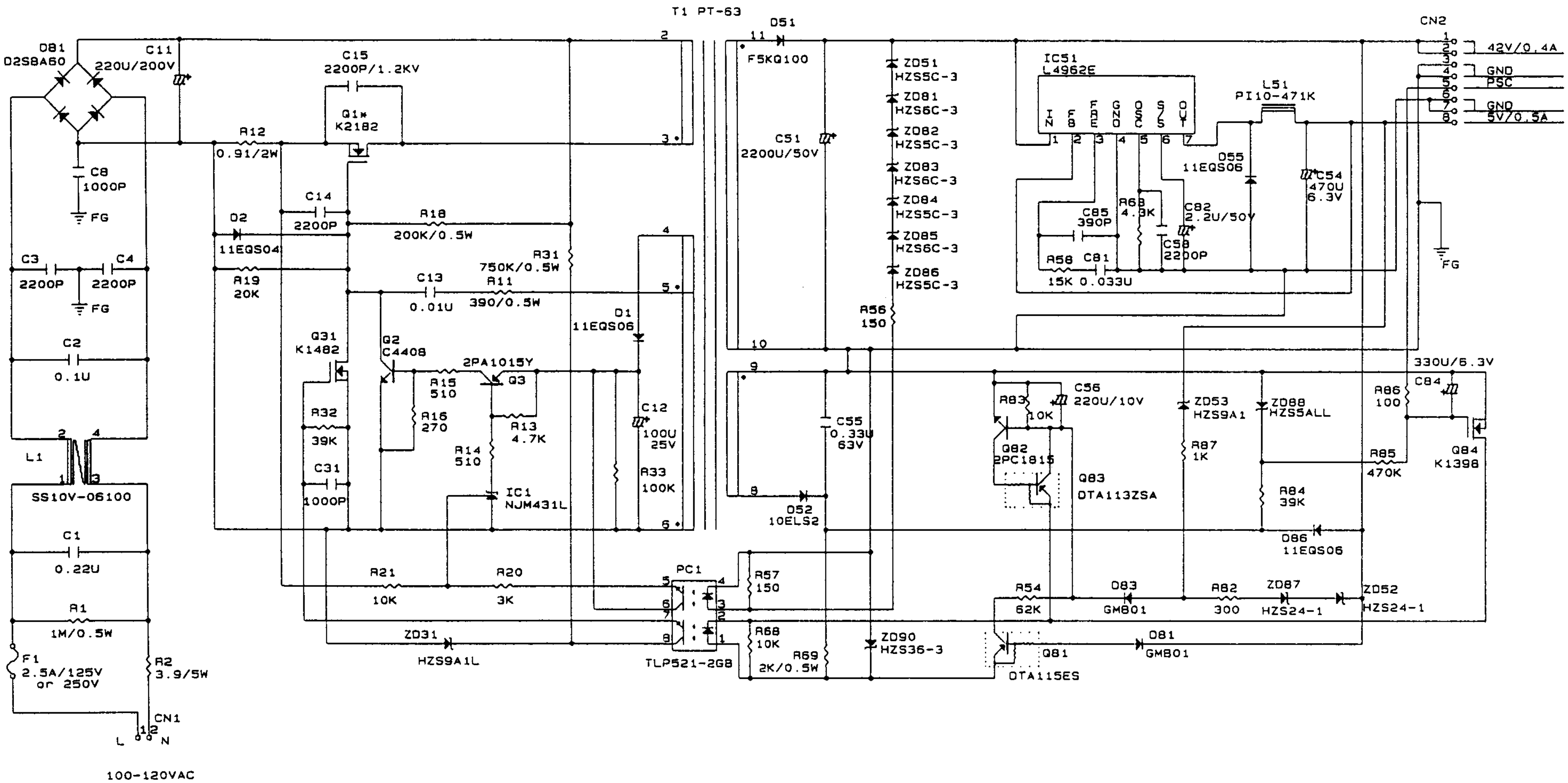
Part #	Parts Price List Description	Common Name
754	Spacer, Tray	Locking Plate (for Waste Ink Pad)
755	Bushing, Fixing, Shaft, Left	
756	Paper Support, Sub, Upper	
757	Holder, Paper Support, Sub, Upper	
758	Torsion Spring, 0.29	
759	Cover, Cartridge, Bk	Ink Cartridge Clamp (Black)
760	Cover, Cartridge, C; B	Ink Cartridge Clamp (Color)
761	Separator, Cartridge, Bk	
762	Separator, Cartridge, C	
763	Detector, HP	ASF Home Position Sensor
764	Cork; B	
765	Cleaner, Head, ASP	Printhead Cleaning Blade

Circuit Diagrams

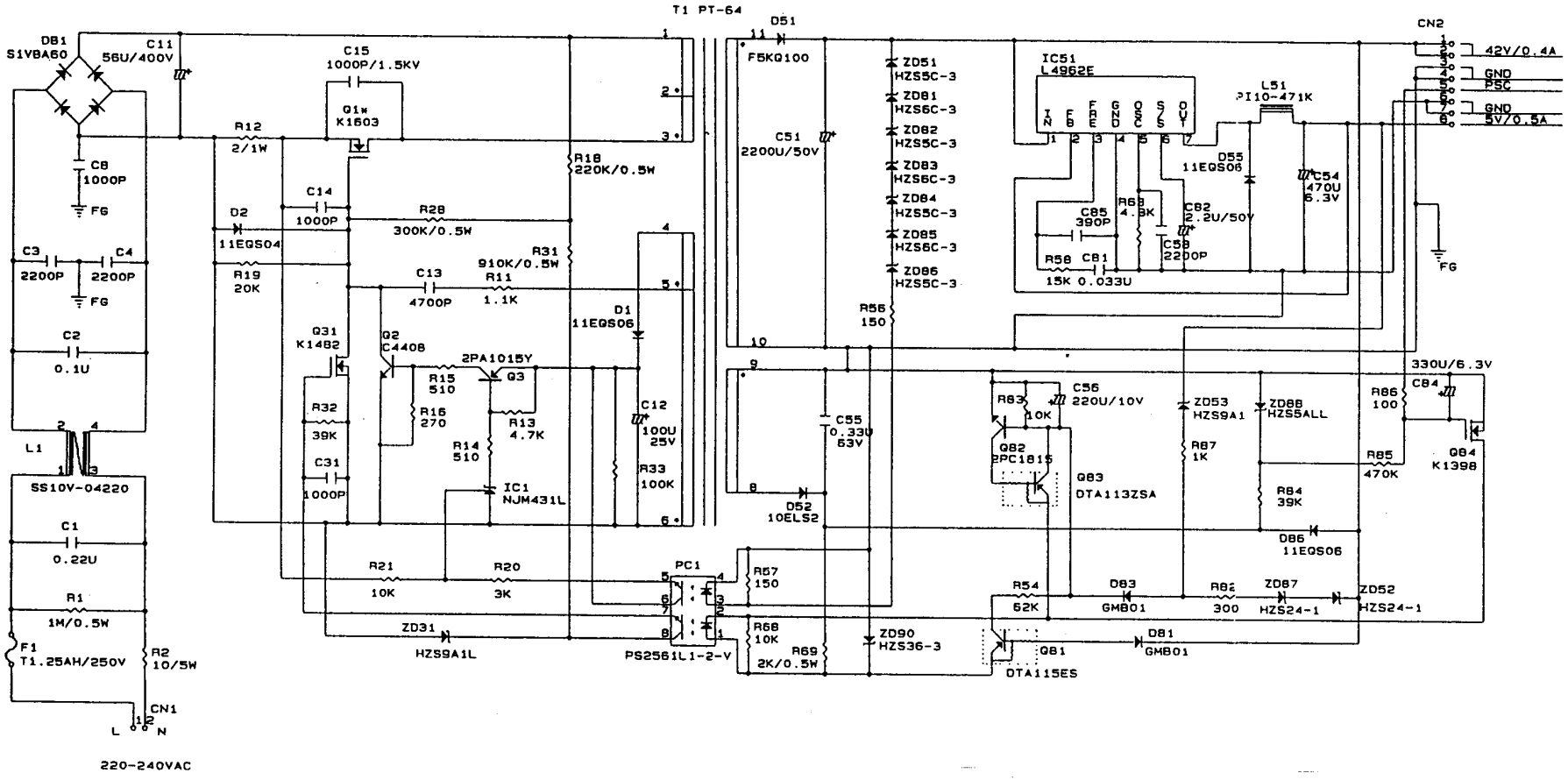
This section contains circuit diagrams for the following boards:

- **C206PSB circuit diagram**
- **C206PSE circuit diagram**
- **C257PSB circuit diagram**
- **C257PSE circuit diagram**
- **C257PSK circuit diagram**
- **C206MAIN-B circuit diagram ***
- **C255MAIN circuit diagram**
- **C256MAIN circuit diagram**
- **C257MAIN circuit diagram**

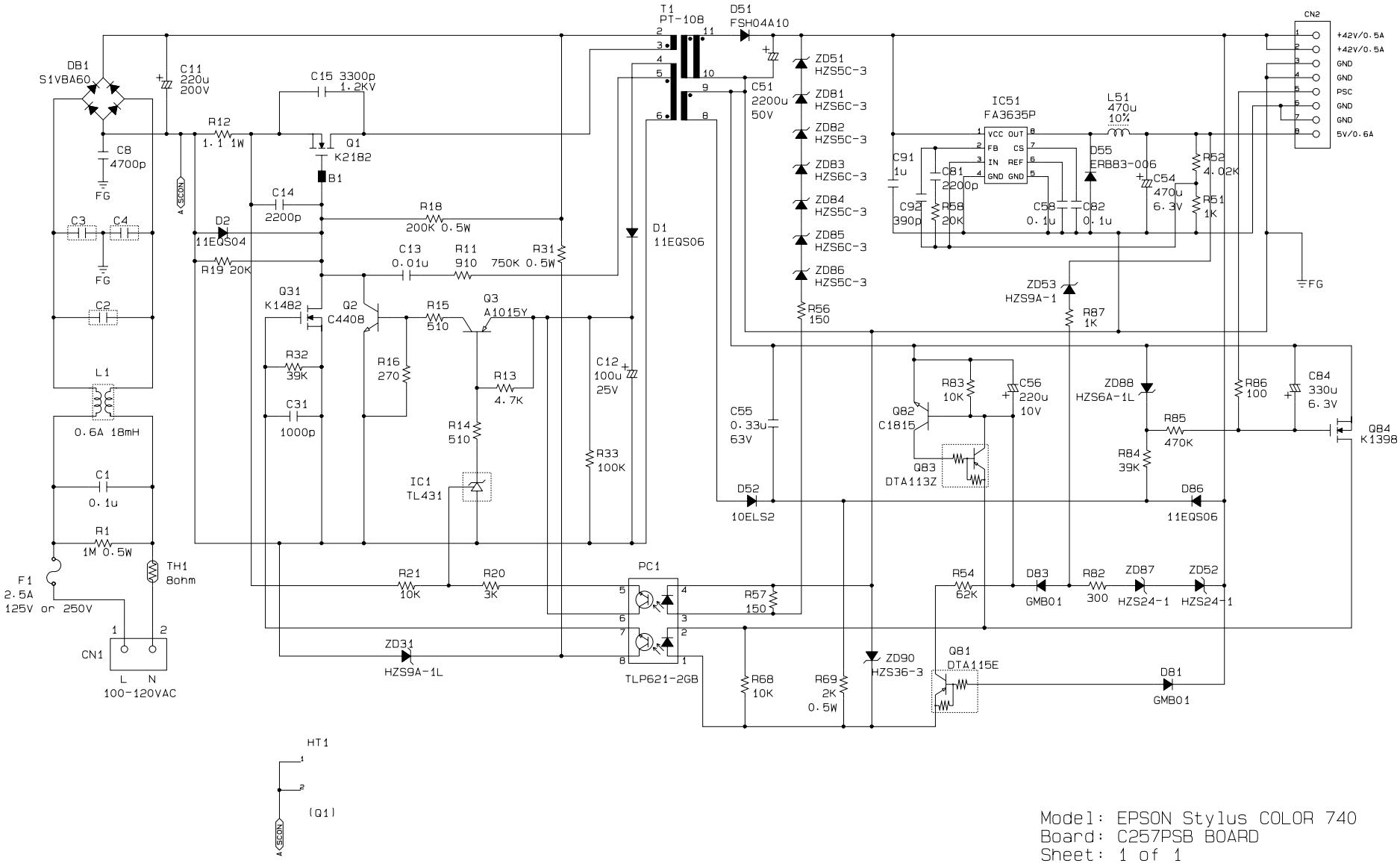
**** NOTE:*** *The electronic (pdf) files for this diagram are not available.*


T1 PT-63
DB1
D2SBA60
C11
220U/200V
C15
2200P/1.2KV
Q1
K2182
R12
0.91/2W
C8
1000P
FG
C14
2200P
D2
11EQS04
R18
200K/0.5W
R31
750K/0.5W
C3
2200P
C4
2200P
R19
20K
C13
0.01U
R11
390/0.5W
D1
11EQS06
C2
0.1U
Q31
K1482
Q2
C4408
2PA1015Y
Q3
R15
510
R16
270
R32
39K
R13
4.7K
R14
510
C12
100U
25V
L1
C31
1000P
IC1
NJM431L
R33
100K
SS10V-06100
C1
0.22U
R21
10K
R20
3K
PC1
R1
1M/0.5W
ZD31
HZS9A1L
TLP521-2GB
F1
2.5A/125V
or 250V
R2
3.9/5W
CN1
L
N
100-120VAC
D51
F5KQ100
C51
2200U/50V
ZD51
HZS5C-3
ZD81
HZS6C-3
ZD82
HZS5C-3
ZD83
HZS6C-3
ZD84
HZS5C-3
ZD85
HZS6C-3
ZD86
HZS5C-3
R56
150
C55
0.33U
63V
D52
10ELS2
R57
150
R68
10K
R69
2K/0.5W
ZD90
HZS36-3
IC51
L4962E
L51
PI10-471K
C85
390P
R68
4.3K
C82
2.2U/50V
C58
2200P
R58
15K
C81
0.033U
D55
11EQS06
C54
470U
6.3V
CN2
42V/0.4A
GND
PSC
GND
5V/0.5A
FG
330U/6.3V
C84
R86
100
R83
10K
C56
220U/10V
Q82
2PC1815
Q83
DTA113ZSA
ZD53
HZS9A1
ZD88
HZS5ALL
R87
1K
R85
470K
Q84
K1398
R84
39K
D86
11EQS06
R54
62K
D83
GMB01
R82
300
ZD87
HZS24-1
ZD52
HZS24-1
Q81
DTA115ES
D81
GMB01

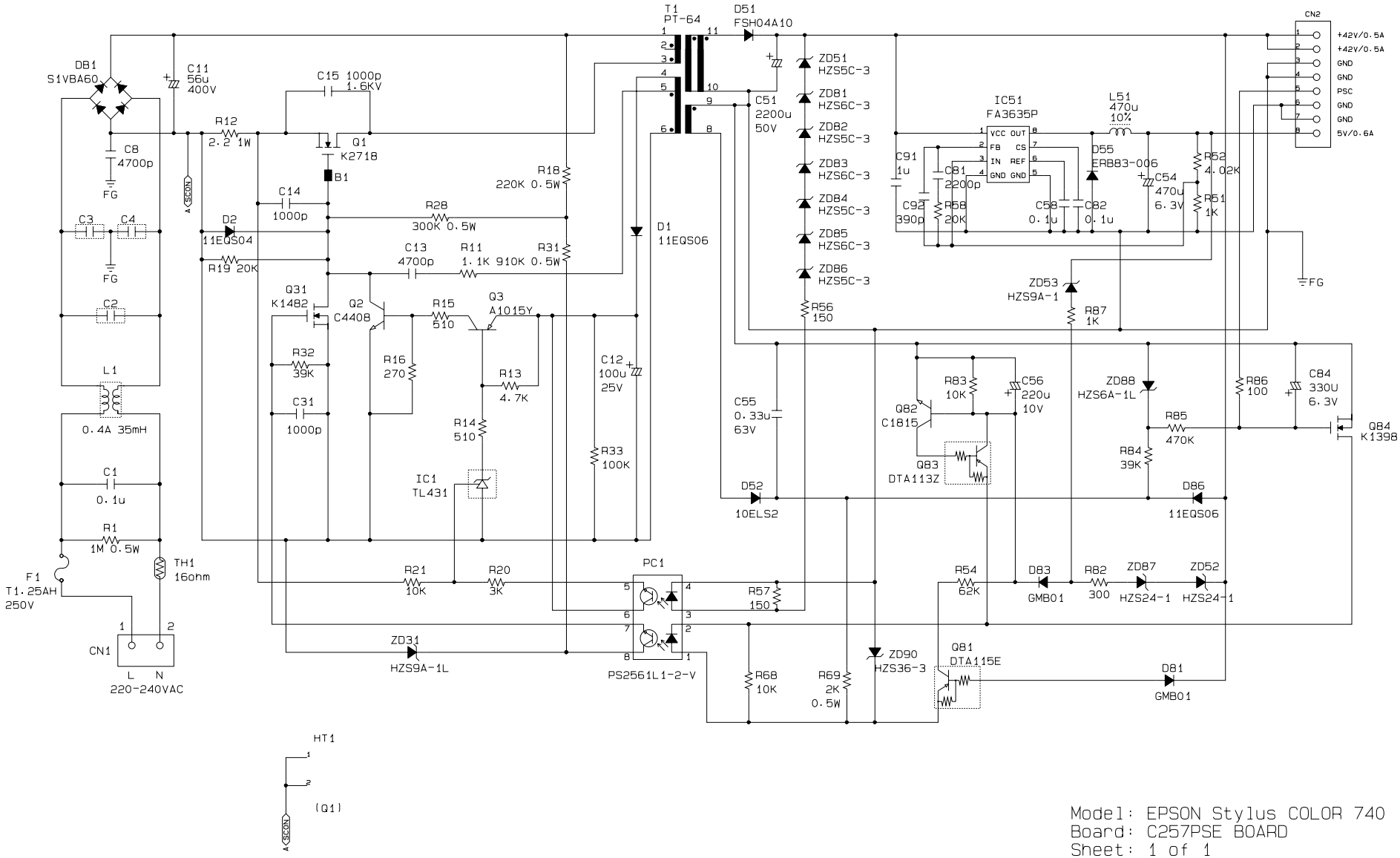
C206PSB 1/1


T1 PT-64
DB1
S1VBA60
C11
56U/400V
C15
1000P/1.5KV
Q1※
K1603
R12
2/1W
C8
1000P
FG
C3
2200P
C4
2200P
FG
C2
0.1U
L1
SS10V-04220
C1
0.22U
R1
1M/0.5W
F1
T1.25AH/250V
R2
10/5W
CN1
L
N
220-240VAC
D2
11EQS04
R19
20K
C14
1000P
R28
300K/0.5W
R18
220K/0.5W
R31
910K/0.5W
C13
4700P
R11
1.1K
Q31
K1482
Q2
C4408
2PA1015Y
Q3
R15
510
R16
270
R13
4.7K
R14
510
R32
39K
C31
1000P
IC1
NJM431L
D1
11EQS06
C12
100U
25V
R33
100K
R21
10K
R20
3K
ZD31
HZS9A1L
PC1
PS2561L1-2-V
R57
150
R68
10K
R69
2K/0.5W
ZD90
HZS36-3
D51
F5KQ100
C51
2200U/50V
ZD51
HZS5C-3
ZD81
HZS6C-3
ZD82
HZS5C-3
ZD83
HZS6C-3
ZD84
HZS5C-3
ZD85
HZS6C-3
ZD86
HZS5C-3
R56
150
C55
0.33U
63V
D52
10ELS2
IC51
L4962E
INH
FREQ
GND
OCS
SYS
OUT
L51
PI10-471K
D55
11EQS06
C54
470U
6.3V
C85
390P
R58
15K
C81
0.033U
R59
4.3K
C82
2.2U/50V
C58
2200P
FG
CN2
42V/0.4A
GND
PSC
GND
5V/0.5A
R83
10K
C56
220U/10V
Q82
2PC1815
Q83
DTA113ZSA
ZD53
HZS9A1
R87
1K
ZD88
HZS5ALL
R84
39K
D86
11EQS06
330U/6.3V
C84
R86
100
R85
470K
Q84
K1398
R54
62K
D83
GMB01
R82
300
ZD87
HZS24-1
ZD52
HZS24-1
Q81
DTA115ES
D81
GMB01

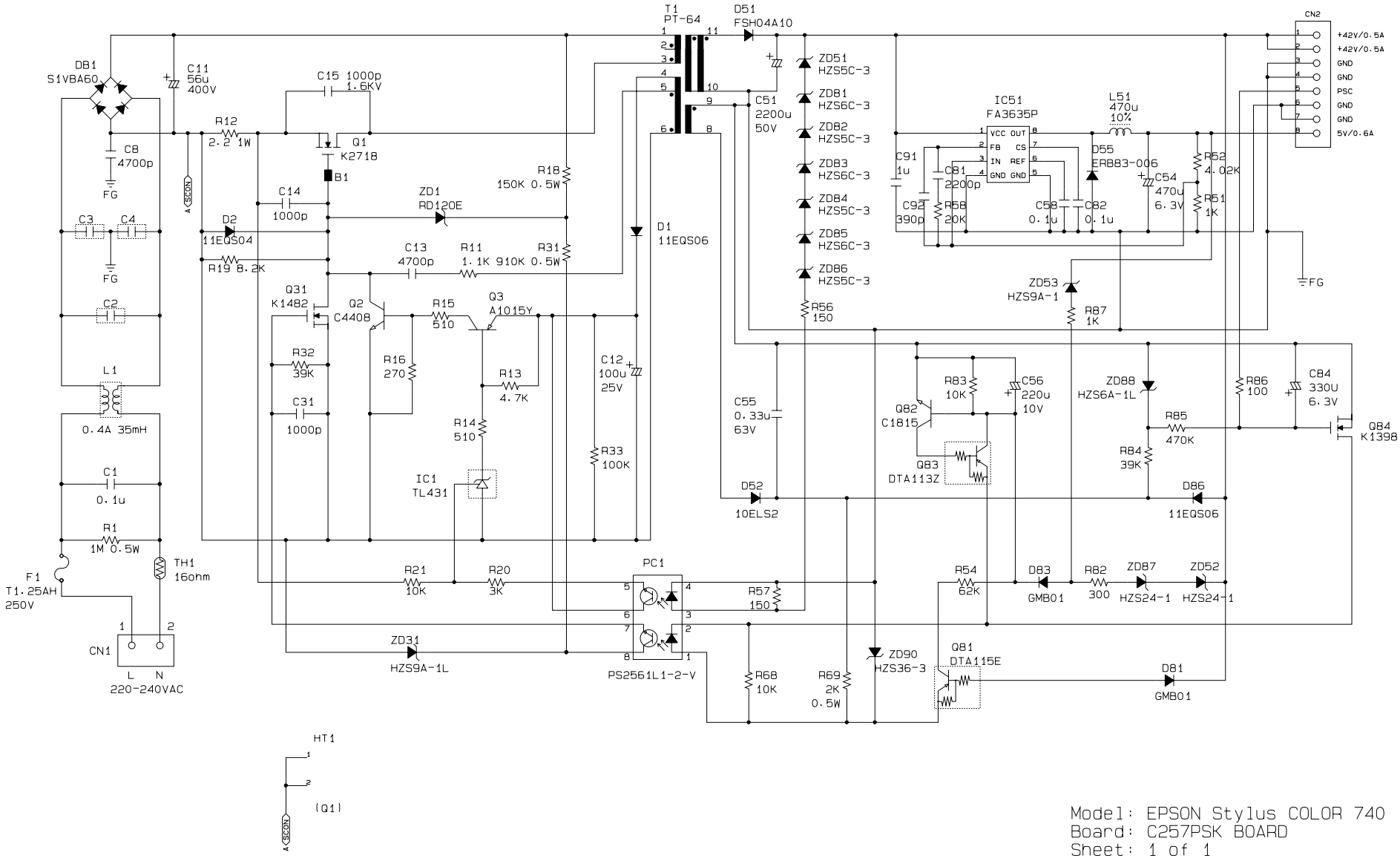
C206PSE 1/1



Model: EPSON Stylus COLOR 740
Board: C257PSB BOARD
Sheet: 1 of 1
Rev.: A

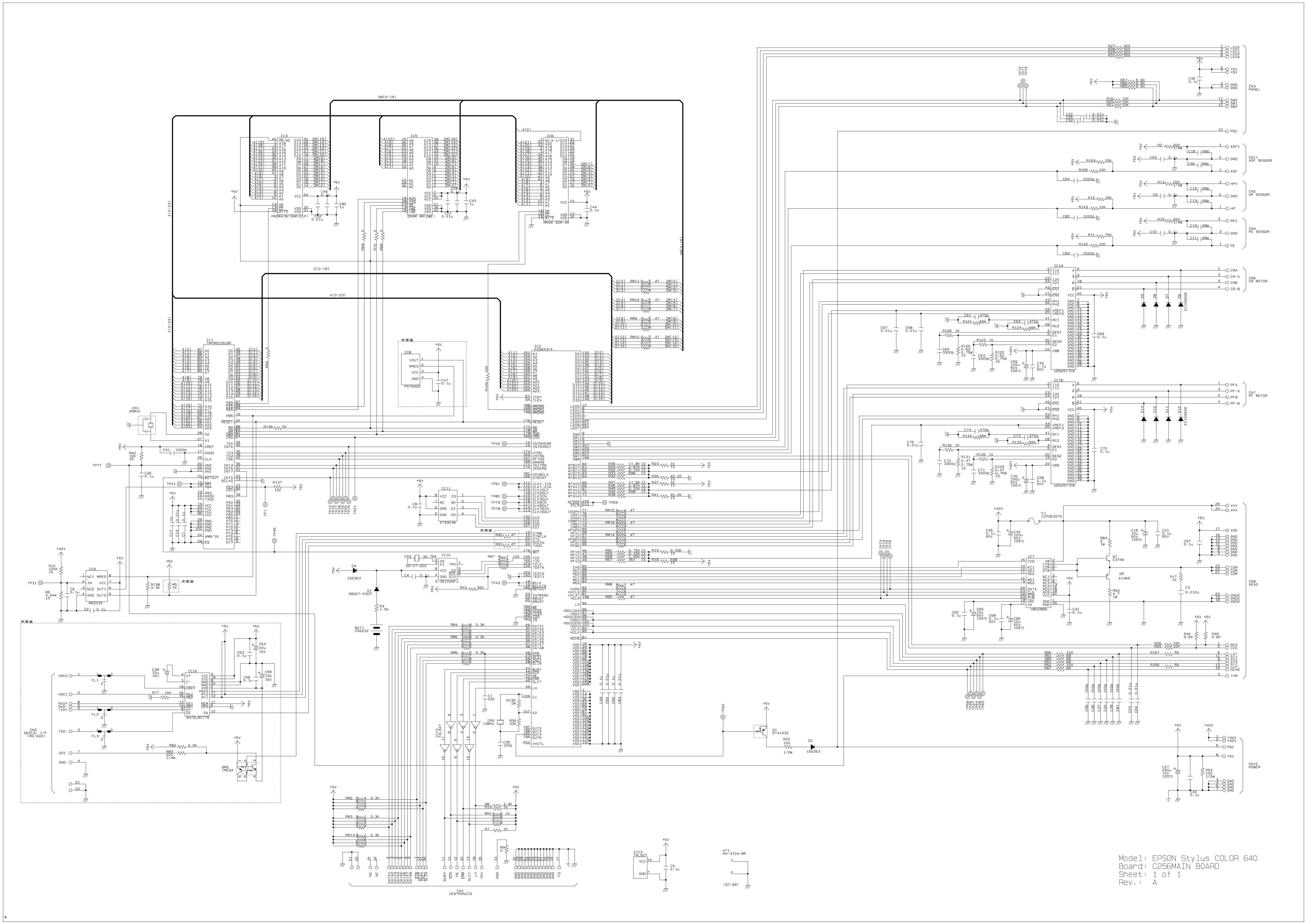


Model: EPSON Stylus COLOR 740
Board: C257PSE BOARD
Sheet: 1 of 1
Rev.: A

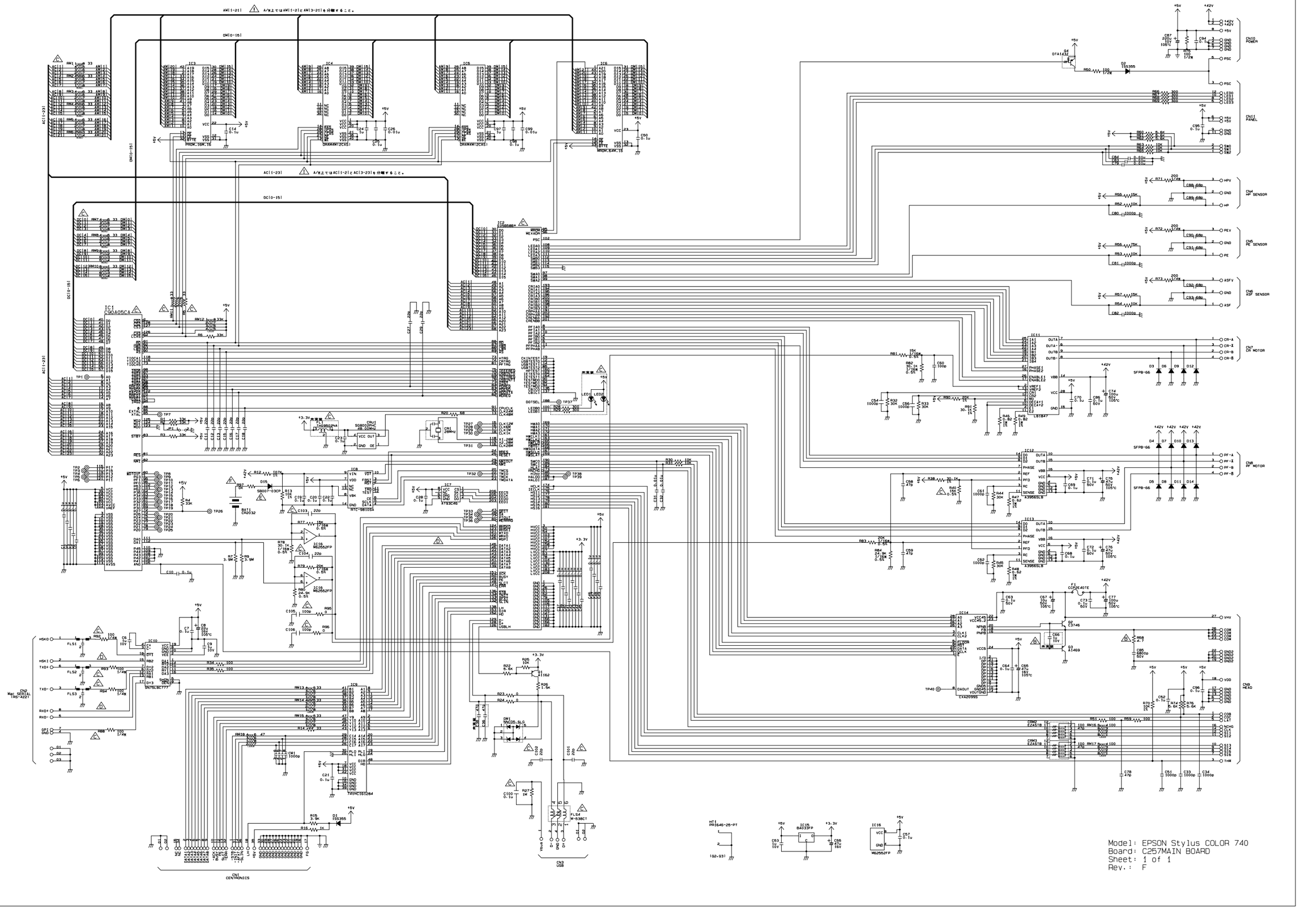


Model: EPSON Stylus COLOR 740
Board: C257PSK BOARD
Sheet: 1 of 1
Rev.: A

Model: EPSON Stylus COLOR 440
Board: C255MAIN BOARD
Sheet: 1 of 1
Rev.: B



Model: EPSON Stylus COLOR 640
Board: C256MAIN BOARD
Sheet: 1 of 1
Rev.: A
CN1 CENTRONICS
CN2 SERIAL I/F (RS-422)
CN3 PANEL
CN4 PE SENSOR
CN5 HP SENSOR
CN6 CR MOTOR
CN7 PF MOTOR
CN8 HEAD
CN10 POWER
CN11 ASF SENSOR


AM[1-21]
A/W上ではAM[1-21]とAM[3-21]を分離すること。
DM[0-15]
AC[1-23]
DC[0-15]
IC1
C90A05CA
IC2
IC3
IC4
IC5
IC6
IC7
IC8
IC9
IC10
IC11
IC12
IC13
IC14
IC15
IC16
CN1 CENTRONICS
CN2 Mac SERIAL (mb-420)
CN3 USB
CN4 HP SENSOR
CN5 PE SENSOR
CN6 ASF SENSOR
CN7 CR MOTOR
CN8 PF MOTOR
CN9 HEAD
CN10 POWER
CN11 PANEL
Model: EPSON Stylus COLOR 740
Board: C257MAIN BOARD
Sheet: 1 of 1
Rev.: F