Intermec
Technologies Corporation

TECHNICAL SERVICES TRAINING

3400 Printer
Section 2

REFERENCE DOCUMENT ONLY

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3400 PRINTER
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3400 Introduction

The 3400 thermal/thermal transfer printer has a print width of 0.50 to 4.1 inches, and an industry standard resolution of 203dpi. Print speed is from 2 to 5 ips for the 3400B and 2 to 6 ips for the 3400C.

The 3400 is a medium duty printer. The 3400C has new features like IPL-3, which provides 1) reverse and inverse printing; 2) direct graphics mode for faster printing throught Windows; 3) disposable formats. The Power LED on the 3400C blinks when the printer is receiving data.

The printer has 3 outline fonts and 21 bitmapped fonts resident along with the Code Page 850 character set. The 3400C incorporates GLOBE, for support of double-byte character sets like the Japanese/Chines/Korean character sets. These character sets can be downloaded into the printer for permanent usage. TrueType outline fonts can be downloaded as bitmapped fonts to the printer.

The 3400 can print PDF417, Data Matrix, Maxicode barcodes as well as the standard one dimension barcodes, and the 3400C can print QR 2D barcode.

Configuring the printer can be done easily by via PrintSet, a Windows utility for configuring the printer, downloading fonts, graphics, formats.

3400 Features

- **Medium duty At 5 or 6 Ips** (3400C)**- 203 Dpi - 4.1 Inch Print Area**
  Reliability is built in because the 3400 is the standard that all Intermec printers are built on. The print density offers good flexibility for printing of barcodes, offering a minimum X dimension of 5 mils.
- **IPL-3 Command Language Enhancements** (3400C)
  This includes a compressed graphics mode for faster printing when using Windows.
  GLOBE (Global Languages On Barcode Equipment) provides for double-byte character sets like Chinese, Japanese and Korean. GLOBE also has printer resident single-byte codepages and downloading other character sets through PrintSet.
  Reverse and inverse printing is supported and barcode symbology enhancements were made like QR 2D code, Maxicode modes 2-5 and high density Code 39.
- **Outline/Vector Font and TrueType Font Support**
  There is 1 outline font resident; c25. It provides rounded, smoother fonts for those customers concerned about font flexibility and font quality. TrueType fonts can be downloaded as bitmapped fonts via PrintSet and used by the printer on any label.
- **Bitmapped Font Capabilities**
  21 point sizes offer customers greater imaging speed and format flexibility with a range of 6 points to 36 points.
- **User Selectable Gap Feature For Fonts**
  A fonts intercharacter gap is adjustable. This can help to maximize the usability of a text fields label area.
- **Memory is 128K or 512K Optional for Storage and 512k for Imaging**
  The 3400 has 128k battery backed RAM for storing downloaded formats, graphics and fonts. Storage can be increased to 512k (3400C)of battery backed CMOS RAM or by using the Flash memory board option (3400C). Image memory uses 512k DRAM to image the label for printing.
- **Parallel Port is Optional**
  The 3400C can use a IEEE 1284 compliant parallel port. The 3400B uses a compatibility mode parallel port.
- **Flash Memory Option for extra Storage** (3400C)
  Flash Storage memory of 2, 6, and 8 Meg for storage of formats, fonts and graphics. The flash card can also be pre-programmed with the Japanese Kanji character set.
- **Cutter Option** (3400C)
  The printer also has a cutter option when a cutter is needed in an application.
- **Simple But Functional Front Panel**
  One button that has 6 functions; 1) feed, 2) feed continuously, 3) off-line, 4) pause, 5) cancel and 6) test and service.
  Three indicator lights; 1) the Green power LED is On when the printer is powered ON or Flashing when the printer is receiving data, 2) the Amber Alert LED is On Solid when there is a hardware fault and Flashes indicating an over-temperature condition, 3) the Yellow Empty/Pause LED is On when there is a label or ribbon no-stock condition and Flashes for a Pause condition while printing or a Off-Line condition when the printer is not printing.

- **Programmable, Non-Volatile Printer Configuration**
  The printer configuration can be changed with online commands. Some commands change printer configuration only while the printer is powered on while other commands change the power up configuration. For example, <ESC>c0 sets the printer for 86xx emulation mode and is valid only while the printer is powered on; <SI>C0 changes the power-up configuration to 86xx emulation mode. All power-up configuration changes are saved in memory. Some configuration settings can also be changed using Test & Service switch settings.

- **AutoSelection of Intermec Protocols**
  When the printer switches are set for Intermec protocol, the printer can automatically discriminate between Standard, Polling Mode D, and Multi-drop protocols. If switch 6 is on and set for Intermec protocol, the printer is forced into multi-drop protocol.

- **Printable Control Characters**
  Beside the normal way of sending commands and data to the printer using control characters, you can now use printable control characters and the printer will interpret them.

  Control characters represent the first 32 characters of the ASCII chart and are normally unprintable. Control characters are entered from the keyboard using the Ctrl key + a printable character, like Ctrl + G is a <BEL> character. This method of using control characters can be confusing, complicated and unworkable with most text editors.

  To simplify the sending of commands and data to the printer, printable control characters were implemented. You can now send the printable characters <+B+E+L+> instead of having to enter control characters like Ctrl + G. This makes it possible to use any text editor to create a file of commands and data for the printer.

- **Image Banding and Memory Management**
  Intermec's image banding technology permits label imaging while printing, delivering fast throughput especially in applications where the data is changing from label to label. This user configurable feature allows customers to maximize printer performance based on label format and print speed requirements. The 4420 not only prints complex labels at a constant speed, but the length of the label is virtually unlimited because of the recycling of memory associated with image bands.

  Most other printers require the entire label be imaged before it can be printed, which results in a longer delay before printing and can also require larger amounts of memory. The 4420s image band memory recycling requires much less memory than competitive printers to accomplish the same task.

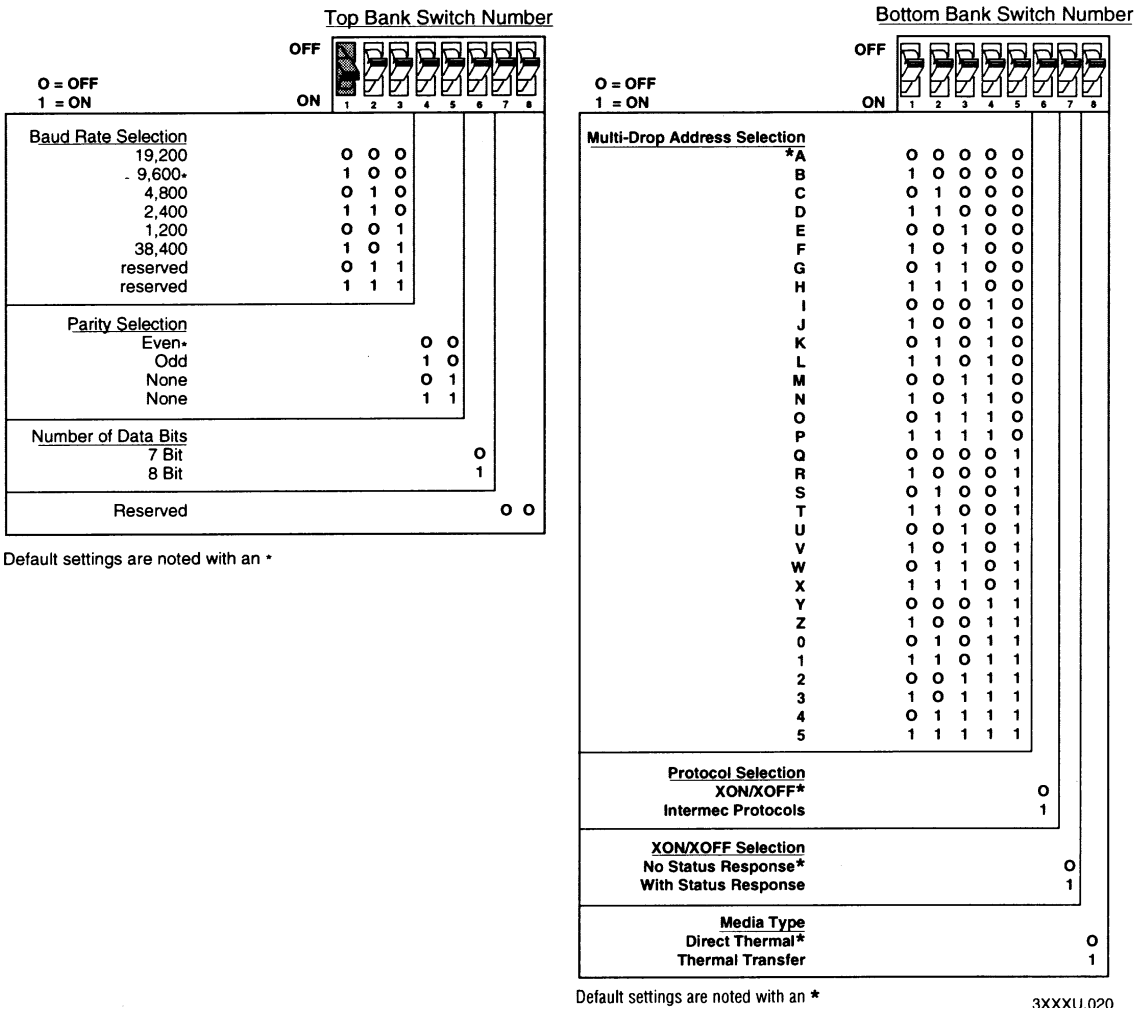
- **Dot-by-Dot Digital Thermal Compensation**
  The 4420s dot-by-dot digital compensation technology works hand-in-hand with Intermec's patented Media Sensitivity numbering system to eliminate the tradeoff between print speed and image quality that many other printers face.

  This energy compensation technology constantly monitors and adjusts the heat to each individual printhead element to ensure optimum print quality for all format types throughout the printers specified operating range. Without this feature, too much heat can be sent to a print head element, resulting in distorted images and the 'blooming effect'.

- **Media Sensitivity Numbering System**
  The 4420 is engineered to automatically optimize print quality for various media. It accomplishes this through Intermec's Media Sensitivity Numbering System (MSN) coupled with Intermec's Digital Thermal Compensation technology. When a customer sets the sensitivity number in the 3400, the printer is optimized to print according to the characteristics of the ribbon and label stock being used and the printer speed. Printers which do not have this feature force customers to experiment with print quality by making adjustments to darkness that are not specific to the media. This frequently leads to media overburning and can cause the printed barcode to be out of specification. The 3400 removes the risk of compliance penalties by having unskilled operators visually adjust the print quality since the printer uses MSN's to automatically optimize print quality.

Media Type	Sensitivity Setting		Media Type	Media Type Sensitivity
800 Series High Sensitivity [TTR Paper]			**500** Series Medium Sensitivity [Paper]	
European Uncoated w/Standard -1	864		European coated w/Premium - 3/6/7	517
Duratran TTR Paper w/Standard-1	854		European coated w/Premium	513
Duratran TTR Paper Tags/Standard-1	834			
			400 Series Medium Sensitivity [DT]	
700 Series High Sensitivity [DT]			European IR	460
Duratherm Lightning Plus -1	740		Duratherm Lightning IR -1	450
Duratherm Lightning Plus -2	720		European Thermal	440
			Duratherm Lightning Labels -2	420
600 Series Medium Sensitivity [Plastic]				
Duratran Polyester w/Premium - 3/6/7	687		**300** Series Low Sensitivity	
Duratran TTR Polyester 1 w/Premium	683		Super Premium Poly. w/Super Prem. -3	369
Duratran Syntran w/Premium - 3/6/7	677		Super Premium Poly. w/Super Prem. -7	366
Duratran Syntran w/Premium	673			
European Polyester w/Premium	637		**100** Series Low Sensitivity [DT]	
European Polyethelene w/Premium	633		Duratherm Buff Tag	190
Duratran Kimdura w/Premium - 3/6/7	627		Duratherm II-1 Labels	180
Duratran Kimdura w/Premium	623		European Tag	170
			Duratherm II Tag	160
500 Series Medium Sensitivity [Paper]			European Top	140
Duratran II-1 w/Premium - 3/6/7	567		Duratherm II-2 Labels	130
Duratran II-1 w/Premium	563		European Thermal Economy Tag	120
Duratran II Tag 5mil w/Premium - 3/6/7	557			
Duratran II Tag 5mil w/Premium	553			
European Tag w/Premium - 3/6/7	537			
European Tag w/Premium	533			
Duratran II Tag 7mil w/Premium - 3/6/7	527			
Duratran II Tag 7mil w/Premium	523			

3400 - Switch Settings



3400A Ver.1.8, and 3400B Ver.1.5 enhancements:

With switches set for Intermec protocol (sw-6 On), and switch 7 bottom is On, the printer is forced into multi-drop protocol. This setting disables the 'protocol auto-detect' feature.

•⇒ Test and Service Mode:

Robust RAM clear is skip is pressed and switches are set for Test and Service mode memory clear.
TTR mode is disabled in Test and Service mode.

Test and Service Mode

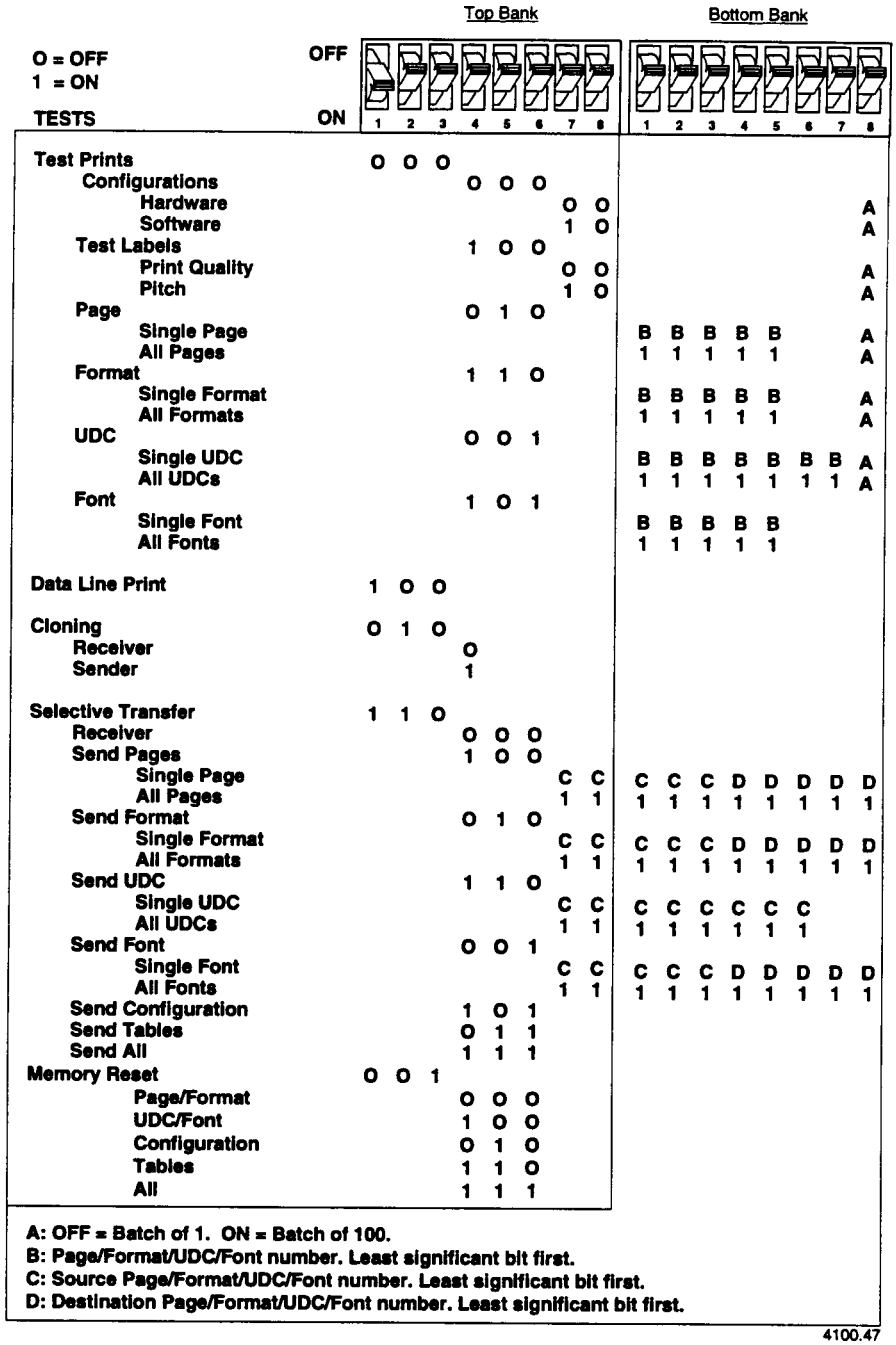
To set the printer for test and service mode, perform the following steps.

1- Press and hold the FEED/PAUSE button while powering ON the printer. This puts the printer into test and service mode. The hardware configuration label will print out and the printer remains in the Data Line Print test until the switches are re-defined.

2- Set the switches for the test desired according to the switch chart below.

3- Press the FEED/PAUSE button to enable the new test.

Test and Service Switch Settings



O = OFF 1 = ON TESTS	OFF ON	Top Bank 1	2	3	4	5	6	7	8	Bottom Bank 1	2	3	4	5	6	7	8
Test Prints		O	O	O													
Configurations					O	O	O										
Hardware								O	O								A
Software								1	O								A
Test Labels					1	O	O										
Print Quality								O	O								A
Pitch								1	O								A
Page					O	1	O										
Single Page										B	B	B	B	B			A
All Pages										1	1	1	1	1			A
Format					1	1	O										
Single Format										B	B	B	B	B			A
All Formats										1	1	1	1	1			A
UDC					O	O	1										
Single UDC										B	B	B	B	B	B	B	A
All UDCs										1	1	1	1	1	1	1	A
Font					1	O	1										
Single Font										B	B	B	B	B			
All Fonts										1	1	1	1	1			
Data Line Print		1	O	O													
Cloning		O	1	O													
Receiver					O												
Sender					1												
Selective Transfer		1	1	O													
Receiver					O	O	O										
Send Pages					1	O	O										
Single Page								C	C	C	C	C	D	D	D	D	D
All Pages								1	1	1	1	1	1	1	1	1	1
Send Format					O	1	O										
Single Format								C	C	C	C	C	D	D	D	D	D
All Formats								1	1	1	1	1	1	1	1	1	1
Send UDC					1	1	O										
Single UDC								C	C	C	C	C	C	C			
All UDCs								1	1	1	1	1	1	1			
Send Font					O	O	1										
Single Font								C	C	C	C	C	D	D	D	D	D
All Fonts								1	1	1	1	1	1	1	1	1	1
Send Configuration					1	O	1										
Send Tables					O	1	1										
Send All					1	1	1										
Memory Reset		O	O	1													
Page/Format					O	O	O										
UDC/Font					1	O	O										
Configuration					O	1	O										
Tables					1	1	O										
All					1	1	1										

A: OFF = Batch of 1. ON = Batch of 100.
B: Page/Format/UDC/Font number. Least significant bit first.
C: Source Page/Format/UDC/Font number. Least significant bit first.
D: Destination Page/Format/UDC/Font number. Least significant bit first.

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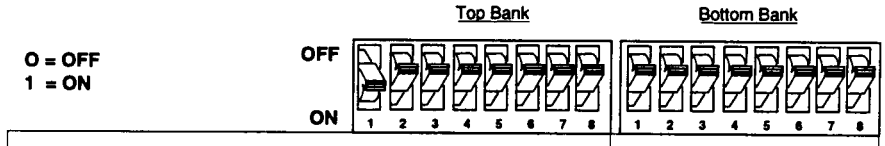
Test and Service Configuration Settings



	Top Bank								Bottom Bank							
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
Label Rest Point	O	1	1													
Adjust Forward				O					N	N	N	N	N			
Adjust Backward				1					N	N	N	N	N			
86XX Emulation	1	O	1													
Advanced Mode				O	O											
10 Mil				1	O											
15 Mil				1	1											
X Forms Adjust	1	1	1	1												
Adjust Forward					O				N	N	N	N	N			
Adjust Backward					1				N	N	N	N	N			
Y Forms Adjust	1	1	1	O					N	N	N	N	N			

N: Number. Least significant bit first.

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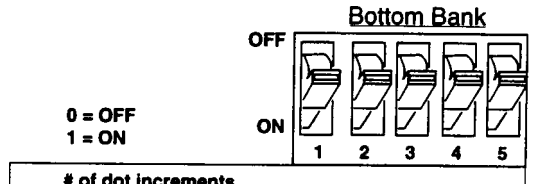
Dot Increment Switch Settings

Use this chart with the above configuration switch chart to set configuration in Test and Service mode.



# of dot increments	1	2	3	4	5
1	1	O	O	O	O
2	O	1	O	O	O
3	1	1	O	O	O
4	O	O	1	O	O
5	1	O	1	O	O
6	O	1	1	O	O
7	1	1	1	O	O
8	O	O	O	1	O
9	1	O	O	1	O
10	O	1	O	1	O
11	1	1	O	1	O
12	O	O	1	1	O
13	1	O	1	1	O
14	O	1	1	1	O
15	1	1	1	1	O
16	O	O	O	O	1
17	1	O	O	O	1
18	O	1	O	O	1
19	1	1	O	O	1
20	O	O	1	O	1
21	1	O	1	O	1
22	O	1	1	O	1
23	1	1	1	O	1
24	O	O	O	1	1
25	1	O	O	1	1
26	O	1	O	1	1
27	1	1	O	1	1
28	O	O	1	1	1
29	1	O	1	1	1
30	O	1	1	1	1

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3400 Printer Specifications

The specifications and performance parameters for the 3400 printer are described in this section.

Dimensions (with no options installed)

Height	11 inches (27.9 cm)
Width	10.5 inches (26.7 cm)
Length	17 inches (43.2 cm)
Weight	35 pounds (15.8 kg)

Electrical Requirements

Input Voltage	100, 115, or 230 VAC ± 10%
Frequency	47-63 Hz

Printing Method

The 3400 printer is capable of direct thermal (DT) printing, or thermal transfer (TTR) printing using thermal transfer ribbon.

Printing Speed

Minimum	2 inches per second (50.8 mm per second)
Maximum	5 inches per second (127 mm per second)
Maximum	6 inches per second (3400C)

The print speed can be changed in 1 ips increments only: 2, 3, 4,5 or 6.

Printhead

Element	0.005 inch square (0.127 mm)
Width	4.1 inches maximum (104 mm)
Resolution	203 dots per inch (8 dots per mm)
"X" dimension	10 mil to 50 mil (0.25 mm to 1.27 mm; 5 mil (0.13 mm) in drag mode only (specified media only)

Media Specifications

Roll Length	6,000 linear inches (152 m)
Width	0.5 inch (13 mm) to 17 inches (432 mm) (stripped media only) 0.5 inch (13 mm)[0.75" including liner] to 5.0 inches (127mm) [4.09" print area].
Thickness	0.0120 inches (.3 mm) maximum
Roll Diameter	8.38 inch maximum diameter (213 mm)

Ribbon Specifications

Roll	6,000 linear inches (152 m)
Widths	2.0 inches (51 mm)
	3.0 inches (76 mm)
	4.1 inches (104 mm)
Diameter	2.25 inches maximum (57 mm)

Environment

Operating	50°F to 104°F (10°C to 40°C)
Humidity	10% to 90% non-condensing

Self-strip Specifications

Media that does not meet self-strip criteria is clearly identified in the appropriate Source Specification as well as the End Item drawing. The self-strip rewinder hub can take up the backing of an entire 6,000" roll of media.

Peel Release	**10-50 grams**

Communications

Asynchronous RS-232C, RS-422, RS-485 interfaces
Serial ASCII code
Hardware (Ready/Busy) Flow Control
XON/XOFF Protocol
Intermec Standard Block Protocol
Polling Mode D Protocol
Multi-drop Protocol
Baud Rates: 1200, 2400, 4800, 9600, 19200, 38400 (3400c)

Fonts and Graphics

There are 9 resident bit mapped scalable fonts (including OCR A and B).

Font ID 3 through 6 and 8 through 19 can be used to download user-defined fonts. One outline font (c25) can be used if expanded memory is installed.

200 dpi graphics resolution

Maximum UDF (font)	**4** inches square (101.6 mm)
Maximum UDC (graphic)	**4** inches square (101.6 mm)

Character Sets

US ASCII	French	256 character ASCII
UK ASCII	Swedish/Finnish	Swiss/Switzerland
German	Italian	Code Page 850
Norwegian/Danish	Spanish	

Memory

imaging	256K (3400A), 512K (3400B/C) of DRAM for label
Storage	32K of SRAM for battery backed format storage
Optional	128K of SRAM (standard on 3400B/C)
	512K or SRAM optional on 3400C

MTBF

The product was demonstrated to have a MTBF greater than 2527 hours at a 100% duty cycle with a 85% confidence when tested per MIL STD 718C test plan VIIC. The environmental operating conditions of the test were "ground benign" and the measurement of reliability excludes the consumables of the printer which includes the print head and media.

Agency Approvals

Safety Requirements

USA	UL 1950 2nd Edition
Canada	CSA C22.2 #950-M89
Europe	EN 60950 (IEC 950 Amendment 1 and 2)

Emission Standards

USA	FCC 15B Class B Verified
Canada	DOC DOR 88/475 Class B Verified
Germany	BZT FTZ 243 Class B
Europe	EC EN 55022 (CISPR 22)

Printer Options

Listed below are the options available for the 3400 printer.

Memory Expansion for 3400C

The memory expansion option replaces the 128K of SRAM with 512K of SRAM to hold more formats, fonts, or bit-mapped graphics. It also increases the printer's image buffering capabilities.

Cutter

This device attaches to the front of the 3400C. Use for applications that require a cutter.

FLASH Memory Card

Can be pre-programmed with the Japanese Kanji and Katakana character set or on the 3400C it can provide for extra format, graphic and font storage in 2, 6 and 8 Meg sizes.

Parallel I/O

This card allows the 3400 to be connected to a Centronics parallel interface compatible host. The 3400C has bi-directional parallel capabilities.

Self-Strip (3400C)

Use self-strip printing in applications where you want to apply labels to a surface immediately. After printing a label, the printer prints out the label with the backing removed. This option must be ordered when you order your printer.

Batch Take-up

This device automatically spools labels as they are printed. This attachment is limited to small batches with maximum OD of 5 inches.

Twinax Interface

This option lets you connect your printer to an IBM Twinax cable system with a Twinax interface so your 3400 printer emulates an IBM 5256 Model 1 printer and can operate with an IBM System/34, System/36, System/38 or AS/400 host computer.

Coax Interface

The Coax Interface Adapter lets the 3400 printer emulate an IBM 3287 printer by connecting the printer to IBM 3270 Type A Coax cable computer systems operating in the VTAM (CICS/IMS/TSO) or 8100 (DPPX) environments. With the Coax adapter you can connect the printer to an IBM 3174/76/99 system controller/multiplexer.

User's Manual

Manuals can be ordered in hard copy or can be downloaded from the internet.

Unpacking the 3400 Printer

Remove the accessories, packing material, and the printer from the shipping container. Set the printer on a clean stable, flat surface and remove the packing material. Save the shipping container and packing materials in case you need to move or ship your printer.

Checking the Order for Completeness

Verify the contents of the shipping container against this list and the figure on the opposite page. If any parts are missing, please contact your local Intermec representative.

- 3400 printer
- AC power cord
- Ribbon core
- 3400 Printer Getting Started Guide
- Media Envelope
- Label Debut Program diskette

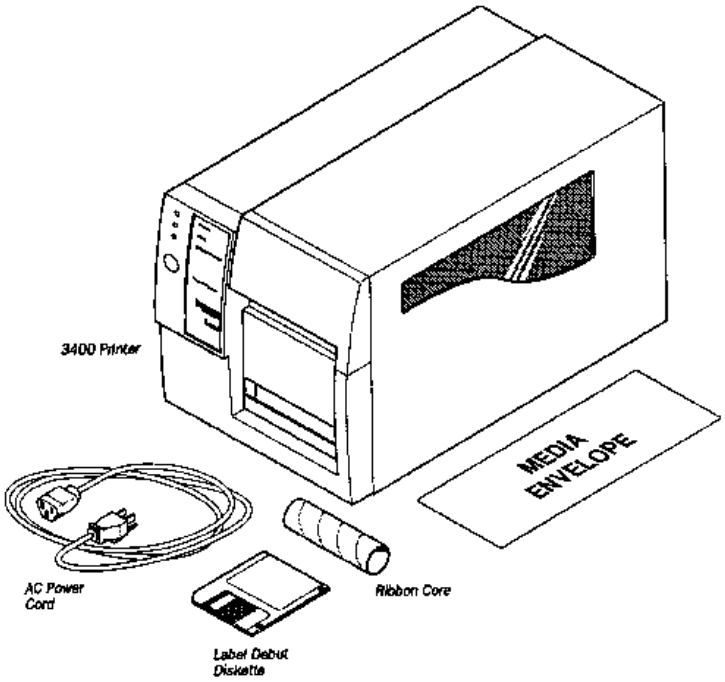
Reporting Damage or Defects

Your 3400 printer was thoroughly tested and inspected before it was shipped from the factory. If any items are damaged, please take the following steps to correct the problem.

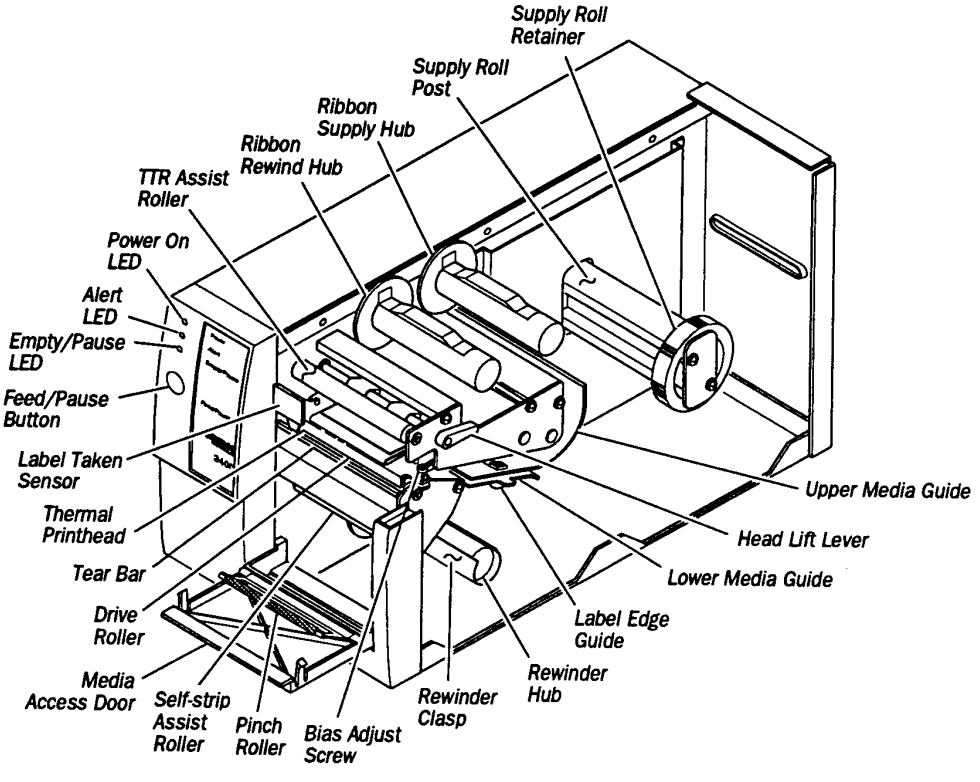
- Take photographs if necessary
- Contact the transport carrier

Note: The customer is responsible for all damage claims against the carrier. See the "Intermec Terms of Sale" printed on your sales invoice.

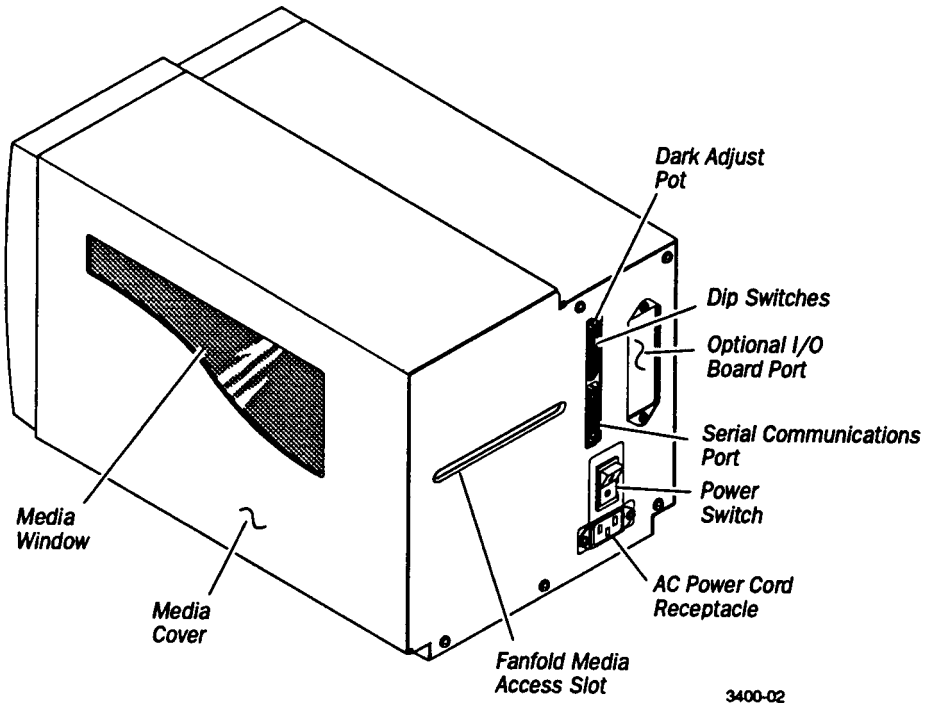
3400 Printer Package Contents



Front View



Back View



Preparing the Printer for Installation

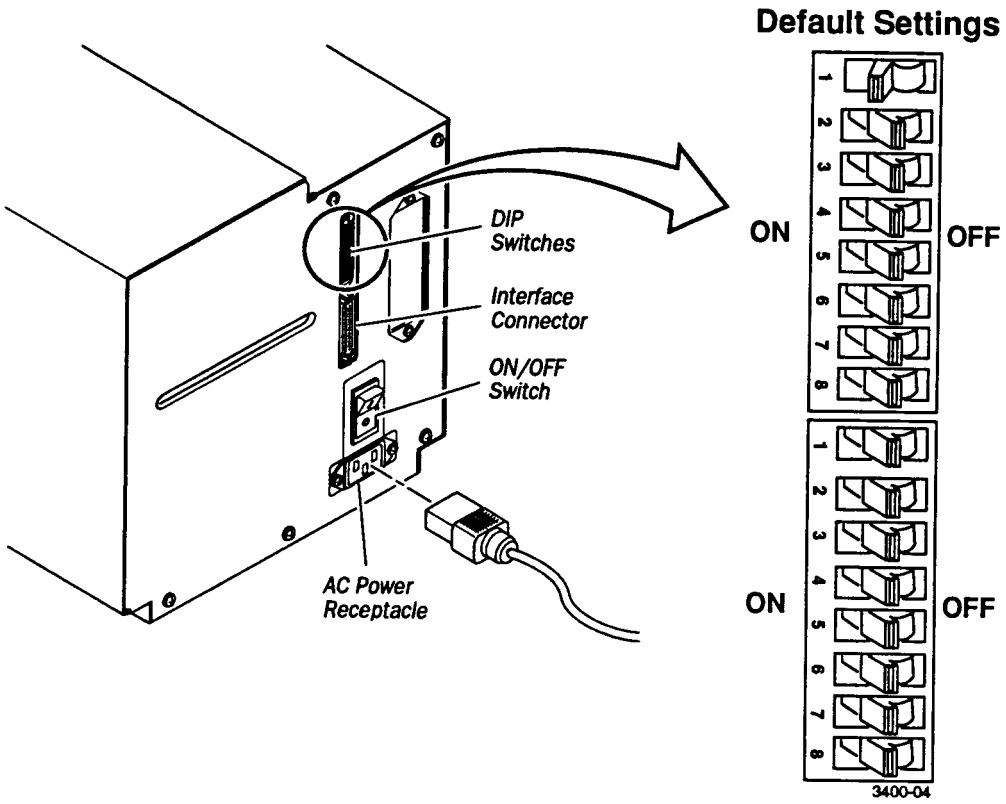
Before installing your 3400 printer and connecting it to your data collection system, you should start your printer and print a configuration test label. This label provides information about the printer's current configuration settings.

Plugging in the Printer

The AC power receptacle and interface connectors are located at the rear of the 3400 printer. The printer's ON/OFF switch is also located at the rear of the printer.

1. Check to make sure that the power switch is in the OFF position.

2. Plug the AC power cord into the receptacle at the rear of the printer.



3. Plug the other end into a grounded wall outlet or surge protector.

Note: Make sure that the DIP switches on the rear panel of the printer are set to their factory default positions. For the top bank, switch 1 is set ON and switches 2-8 are set OFF. For the bottom bank, switches 1-8 are set OFF. Refer to the previous illustration. See the Appendix for details on the 3400 factory default settings.

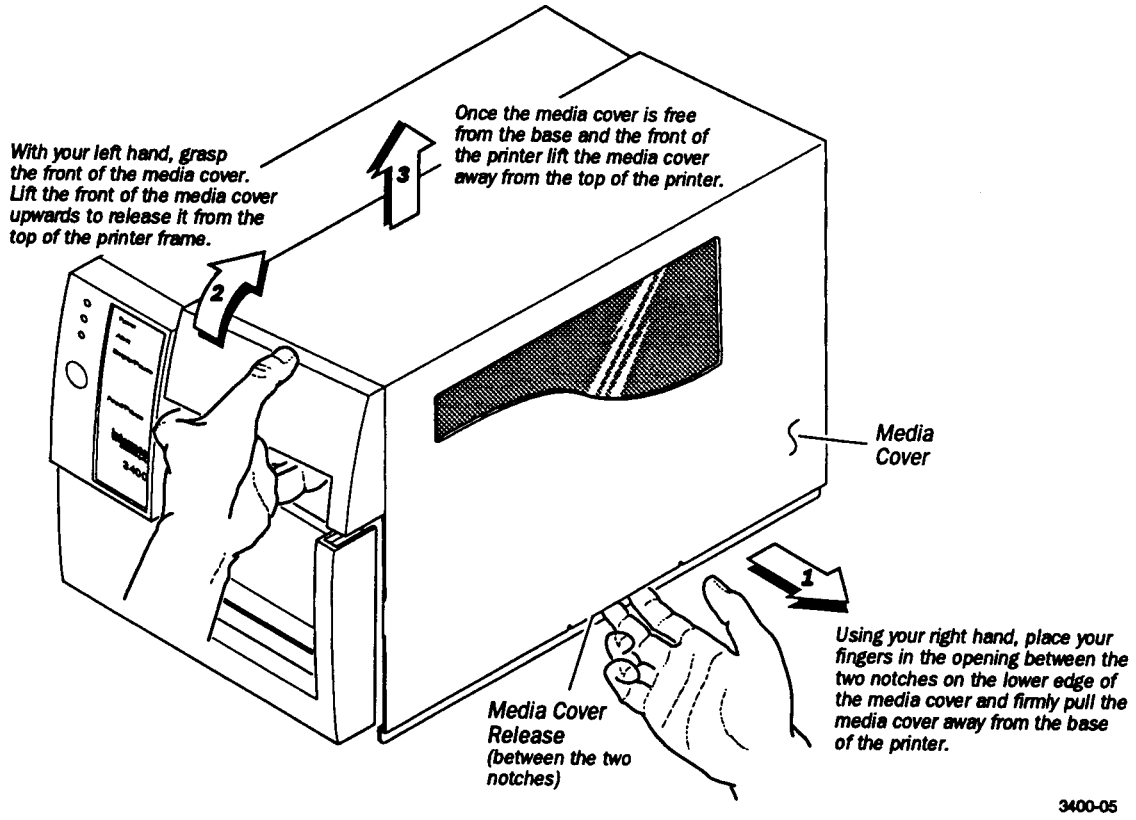
4. Set the power switch (located at the rear of the printer) to the ON position. When the printer is fully powered, the Power On LED is lit. The empty/pause indicator flashes and the printer (platen roller) advances.

Opening the Printer

You need to open the printer every time you load media or perform maintenance procedures.

1. Pull the bottom of the media cover out and up to release it from the printer.

2. Lift up on the media cover until it is released from the printer.



Loading Media for Fanfold Printing

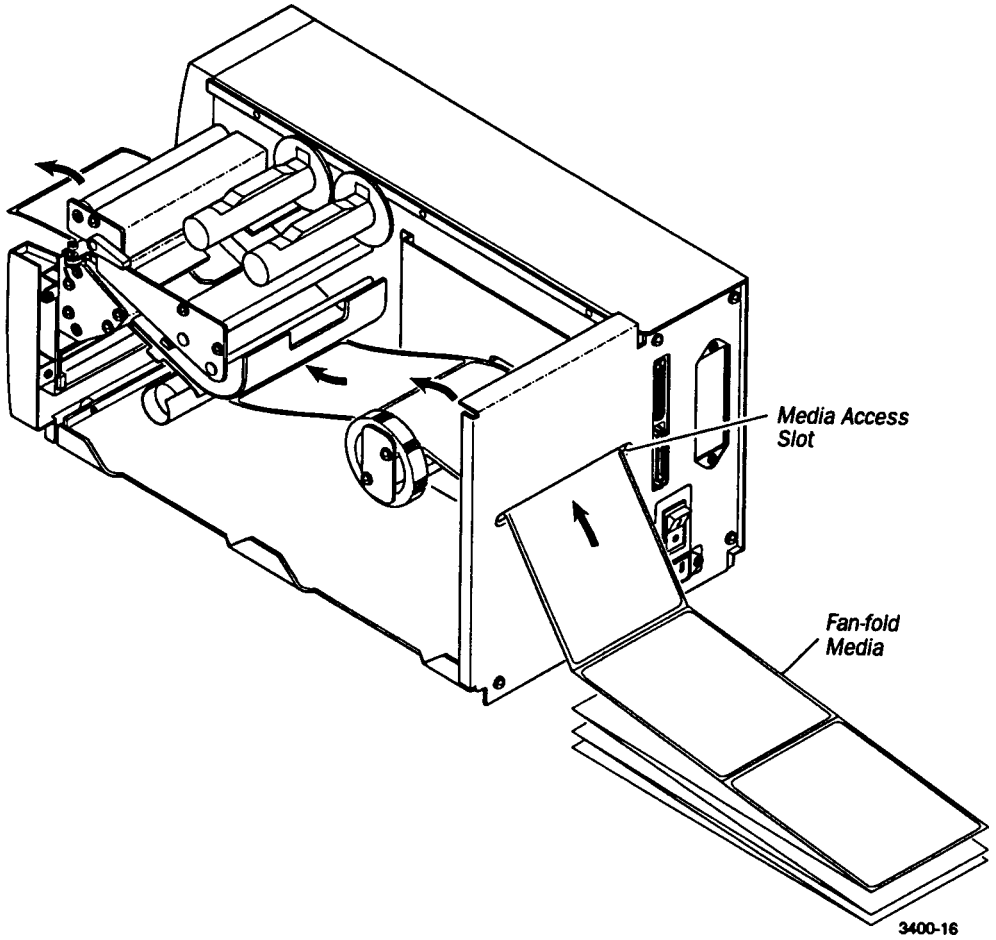
Use the sample of fanfold media provided in the Media Envelope to complete the following procedures. In fanfold printing, a stack of fanfold media is placed at the rear of the printer and fed into the printer through a slot in the rear cover. The media is fed into the printer mechanism using the same method as straight-through printing.

1. Open the printer.

2. Lift the printhead by rotating the head lift lever clockwise until it releases.

3. Remove the supply roll retainer by turning it counter-clockwise and sliding it to the outer end of the supply post.

4. Place the fanfold media slightly lower than the slot in the printer back cover. Line the (box of) fanfold media up with the label path through the printer. Insert media through the slot at the rear of the printer and thread it over the supply roll post.



5. To allow easy access to the media path, pull down on the lower media guide. Make sure that the edge guide is slid all the way to the outer edge of the edge guide plate.
6. Insert the fanfold media through the printer mechanism as shown. The front edge of the media should pass over the tear-bar and through the label dispense opening in the media cover. The fanfold media should pass over the supply roll post.
7. Release the lower media guide and adjust the edge guide to position the media firmly against the inside wall of the printer.
8. Slide the supply roll retainer up to the edge of the fanfold media and turn the supply roll retainer clockwise until it locks in place.
9. Lower the printhead by rotating the head lift lever counter-clockwise until it locks.
10. Close the printer.
11. Press [FEED/PAUSE] to advance one label through the printer and out the label opening in the front cover. The printer is now ready to print the configuration test label. The yellow Empty/Pause LED goes out.

Printing the Hardware Configuration Test Label

Once media is loaded in the printer, you are ready to print the hardware configuration test label. The hardware configuration test label lists your printer's configuration. Use this label for reference when installing your 3400 printer and for verification of proper printer operation.

To print the hardware configuration test label:

1. Turn the printer power switch to the OFF position.
2. Press and hold the **[FEED/PAUSE]** button while powering on the printer. The printer presents the test labels.
3. Release the **[FEED/PAUSE]** button when the media starts moving. You are now ready to install the 3400 printer.

Hardware Configuration Test Label Does Not Print

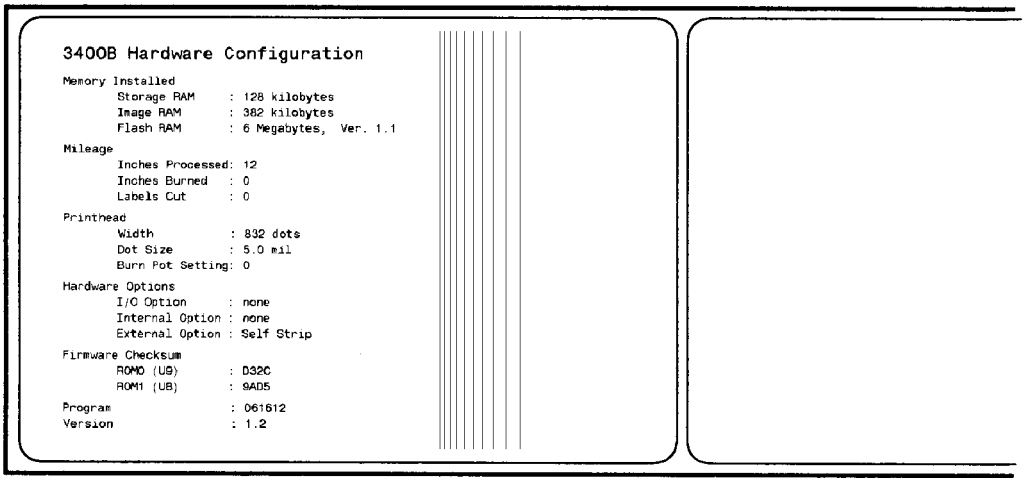
If you are unable to print a hardware configuration test label, please refer to the section on, "Troubleshooting and Special Procedures" for guidance.

What the Hardware Configuration Test Label Says

The hardware test label provides statistics on the printer's *installed memory*, *printer program number* and *version*, the *amount of media printed*, and the *printhead configuration*.
The 3400 Hardware Configuration Label that your printer produces should look similar to the label on the following page.

3400 Hardware Config. Test Label

Hardware Configuration Label



Connecting the Printer to the Host

This section contains a procedure for connecting your printer in a point-to-point installation. Please refer to the Appendix for information on non-switched modem and network installations.

In order to connect the 3400 printer to your system, you need a cable with:

- A serial RS-232 null modem or RS-422/85 interface
- A 25-pin D-style male subminature connector on the printer end
- A connector for the host computer on the other end

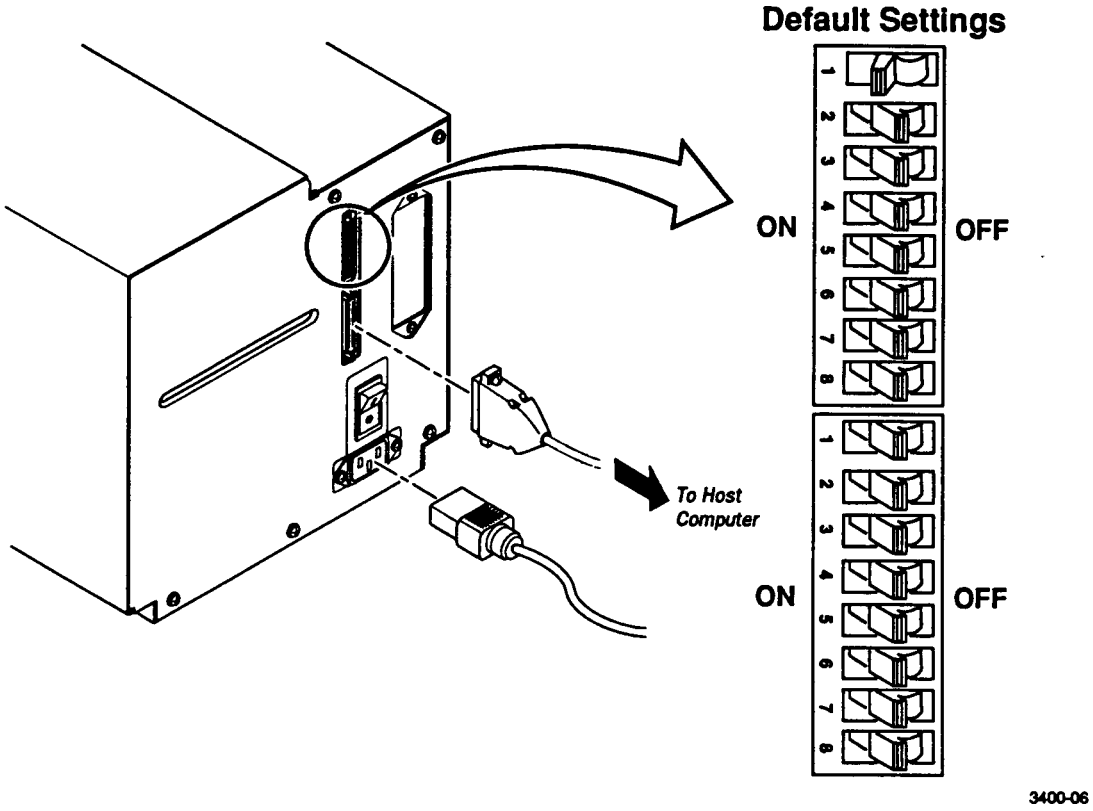
If you are unsure about which cable to use, refer to the "Interface Cables and Connectors" section. Complete the following steps to install your printer:

Note: The printer should always be powered down when connecting or disconnecting cables.

1. Plug the 25-pin plug into the serial port (COM1:) on the rear of the 3400 printer.

2. Plug the other end of the cable into a serial port on the host computer.

3. If necessary, change the printer configuration to match the host. Refer to "Configuring the Serial Port" in this section for more information.



Testing for Communication With the Host

Once you have the printer installed in your system, it is a good idea to test for communication with the host. The easiest way to test communications is to set the printer to data line print mode. To do this power up the printer while pressing the front panel button as you did for printing the configuration test labels. This powers the printer up in Test and Service mode. If you are already in data line print mode, proceed to step 4. If you are not in data line print mode, start with step 1.

1. Turn the printer power switch to the OFF position.

2. Press and hold the **[FEED/PAUSE]** button while powering on the printer. The printer presents the hardware configuration test label.

3. Release the **[FEED/PAUSE]** button after the hardware configuration label is printed.

You are now in data line print mode (in Test and Service mode).

4. Send down some characters from the host. At this point the printer does not attempt to interpret any printer commands, it simply prints each character and its hexadecimal equivalent as it is received.
If you are using a PC running DOS, send down the following strings of commands from the DOS prompt:

```
MODE COM1: 96,E,7,1,N [Enter] - this assumes you are using Com port #1

COPY CON COM1: [Enter]
ABCDEF^Z ([Ctrl]+[Z]) [Enter]
```

Where:

`MODE COM1: 96, E, 7, 1, N` configures the serial port.

`COPY CON COM1:` tells the PC to copy the following information to COM1:.

`ABCDEF` are random characters entered at the host.

`^Z` (or Ctrl + z) sends the information to the printer.

The following is printed:

A B C D E F

41 42 43 44 45 46

5. To enter normal print mode again, repower the printer.
If this procedure does not work, check to make sure that the DIP switches are set to the default configuration and that the printer cable is plugged into COM1: of your PC.

Notes: If you are using a different platform to communicate with your printer, refer to section on Printer Commands, for information on downloading commands.

For Windows users, you can send information to the printer using Windows Terminal or HyperTerminal for Windows95. Be sure the comm. port settings match the printer.

Testing serial communication of the printer itself can be done by shorting pins 2 and 3 on the printer and pressing Feed/Reload when in Data Line Print.

Configuring the Serial Port

The serial port settings of the 3400 printer should match those of your host computer or network controlling device. If the default settings do not match your configuration needs, use the following table along with the DIP switch settings table to change them to the appropriate settings.

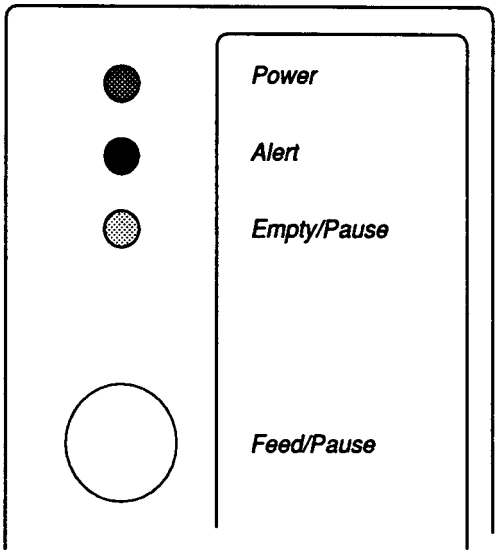
Serial Port Settings

The options for the printer serial port settings are summarized here.

Parameter	Settings	Description
Baud Rate	1200, 2400, 4800, 9600, 19,200, 38400	The rate, in bits per second (bps), at which the host exchanges data with the printer.
Data Bits	7 or 8	The number of bits that represent the ASCII characters.
Parity	Even , Odd, None	Checks each transmitted character for errors.
Protocol	Intermec, XON/XOFF, XON/XOFF with Status	The type of network used to connect the printer, the host, and the rest of the data collection system. Intermec protocol includes "Standard", Polling Mode D, and Multi-drop protocols.
Device Address	A to Z, 0 to 5	Unique address for each device connected using multi-drop protocol.
Test and Service	Test Prints, Data Line Print, Cloning, Selective Transfer, Memory Reset	Provides printer diagnostics to the host and prints test labels.

Understanding the Front Panel

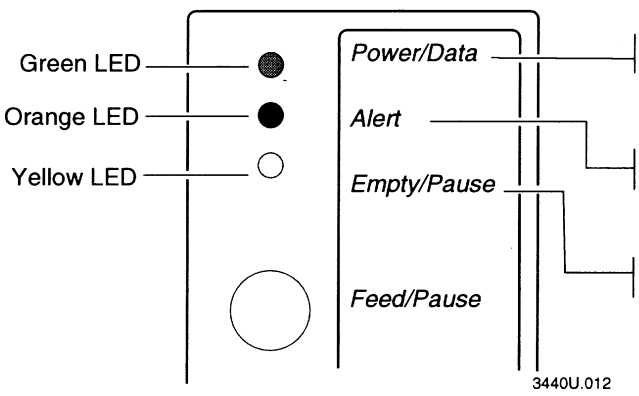
The front of the 3400 printer, illustrated below, contains one button and three indicator lights used in printer operation.



3400-11

LED Indicators

The three LED indicators located on the front of the printer operate as follows:



3440U.012

LED	State	Indication
Power/Data	Off	Power off
	On	Power on
	Flashing	Receiving data
Alert	Off	Printing or idle
	Flashing	Over-temperature
	On	System fault
Empty/Pause	Off	Printing or idle
	Flashing	Paused
	On	Media fault

Over-Temperature

If the printer experiences an over-temperature condition of the printhead, the Alert LED on the printer flashes and the printer stops. No intervention is required. Just allow the printer enough time to cool down and it will resume operation on its own.

Media or System Faults

If your printer experiences a media or system fault, please refer to the "Troubleshooting and Special Procedures" for information on correcting the problem.

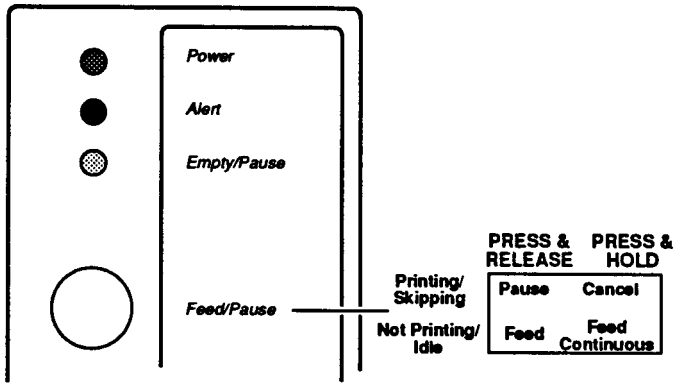
Feed/Pause Button

The **[FEED/PAUSE]** button, located on the front of the 3400 Printer, performs **6** functions depending on the mode of the printer.

If the printer is idle, *pressing and releasing* the **[FEED/PAUSE]** button causes the printer to feed out one label or a minimum specified amount of media if continuous stock. *Pressing and holding* the button down causes media to feed continuously until the button is released. *Pressing the button 2 times* in quick succession takes the printer offline, and transmits a <DC3> to the host. When offline, the Empty/Pause LED will blink. Pressing the Feed/Pause button again puts the printer back online and a <DC1> character is sent to the host.

If the printer is printing, *pressing and releasing* the **[FEED/PAUSE]** button causes the printer to pause. Subsequent pressing and releasing of the button allows the printer to resume printing.
To cancel the current print job, *press and hold* the button down until the printer stops printing. When the **[FEED/PAUSE]** button is first pushed, the Empty/Pause LED flashes and the printer finishes printing the current label (the Empty/Pause LED stays on steady for a few seconds). When you release the [FEED/PAUSE] button, the Empty/Pause LED goes out and the current print job is canceled.

The following illustration outlines the button functions described in the previous paragraph:



The 6th function of the [FEED/PAUSE] button is activated when the printer is powered on. If the button is held down as the printer is powered on, the printer prints out the hardware configuration test label and stays in Data Dump mode.

Loading Media into the Printer

You can feed media through the 3400 printer in three different ways:

- Straight-through printing
- Self-strip printing
- Fan fold printing (outlined in , "Getting Started")

When loading media, the power to the printer can either be turned ON or OFF. The following procedures for loading media assume that the printer has been powered ON.

Straight Through Printing

In straight through printing, a roll of media is loaded on the supply roll post and fed straight through the printer mechanism and out the label dispense opening in the front panel. As individual labels are printed, you can remove them from the roll by pulling them down across the tear bar.

Note: This procedure covers how to load media for straight-through print mode using a roll of direct thermal or thermal transfer label media. The default setting for the printer is direct thermal mode.

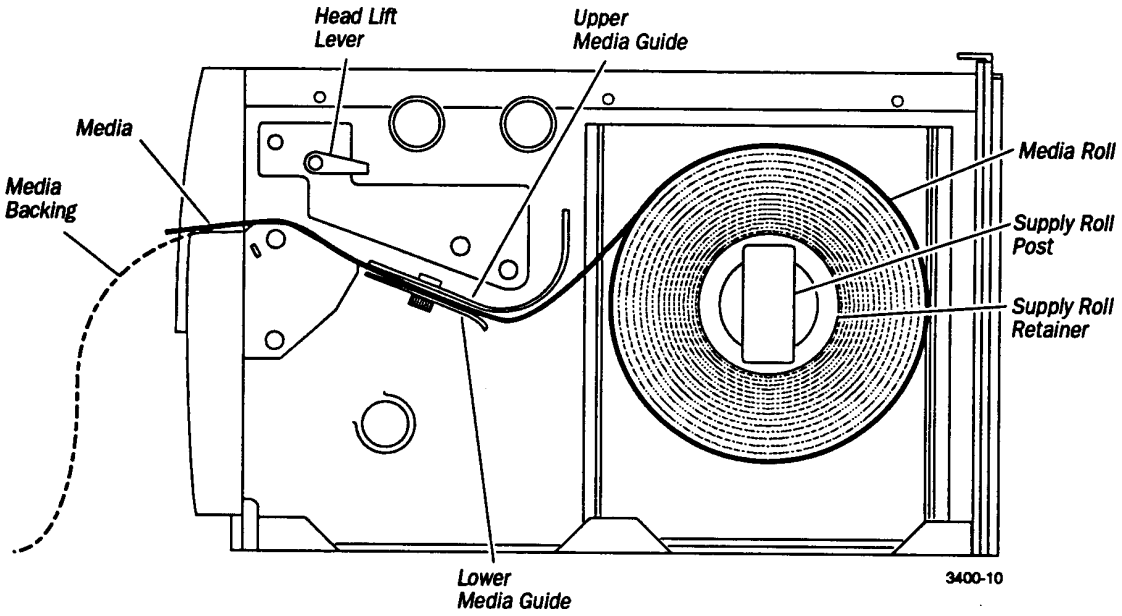
To load the media, perform the following steps while referring to the accompanying illustration:

1. Raise the printhead by rotating the head lift lever clockwise until the printhead disengages.
2. Turn the supply roll retainer counter-clockwise to release it and slide it to the outer end of the supply roll post.

Note: This is not required when replenishing media of the same width.

3. Place the media roll on the supply roll post and position it firmly against the printer.
4. Slide the supply roll retainer up to the edge of the media roll and turn the supply roll retainer clockwise to tighten.

Loading Media In the 3400 Printer



5. Pull down on the lower media guide to allow easy access to the media path. Make sure that the edge guide is slid all the way to the outer edge of the lower media guide.

Note: If you are replacing the empty media roll with a new roll of the same width, you do not need to adjust the edge guide or the supply roll retainer.

6. Insert the label stock through the printer mechanism as shown. Make sure the label passes between the upper and lower media guides. The front edge of the media should pass over the tear bar and out the front of the printer.
7. Release the lower media guide and adjust the edge guide to position the media firmly against the inside wall of the printer.

Note: If you are using thermal transfer media, refer to the following section for information on loading the thermal transfer ribbon.

8. Lower the printhead by rotating the head lift lever counter-clockwise until it locks.

9. If you are using continuous media or mark label stock, you must send down the Label Stock Type command (<SI>T) to properly configure the printer. For example type the following command from the DOS prompt to *select continuous label stock*:

   MODE COM1: 96,E,7,1,N [Enter] (if not set)

   COPY CON COM1: [Enter]
   <STX><SI>T0<ETX>^Z ([Ctrl] + [z]) [Enter]

   Where:

   MODE COM1: 96,E,7,1,N configures the serial port.

   COPY CON COM1: copies the information to COM1:

   <SI>T0 sets the label stock to continuous media.

   ^Z ([Ctrl] + [z]) sends the command to the printer.

10. Press [FEED/PAUSE] to advance several inches of media through the printer and out the label opening in the front cover. Your printer is now ready to print labels.

Note: There is a label with directions for loading media located on the inside of the media cover. For your convenience, you may want to refer to it when loading media.

Self-strip Printing

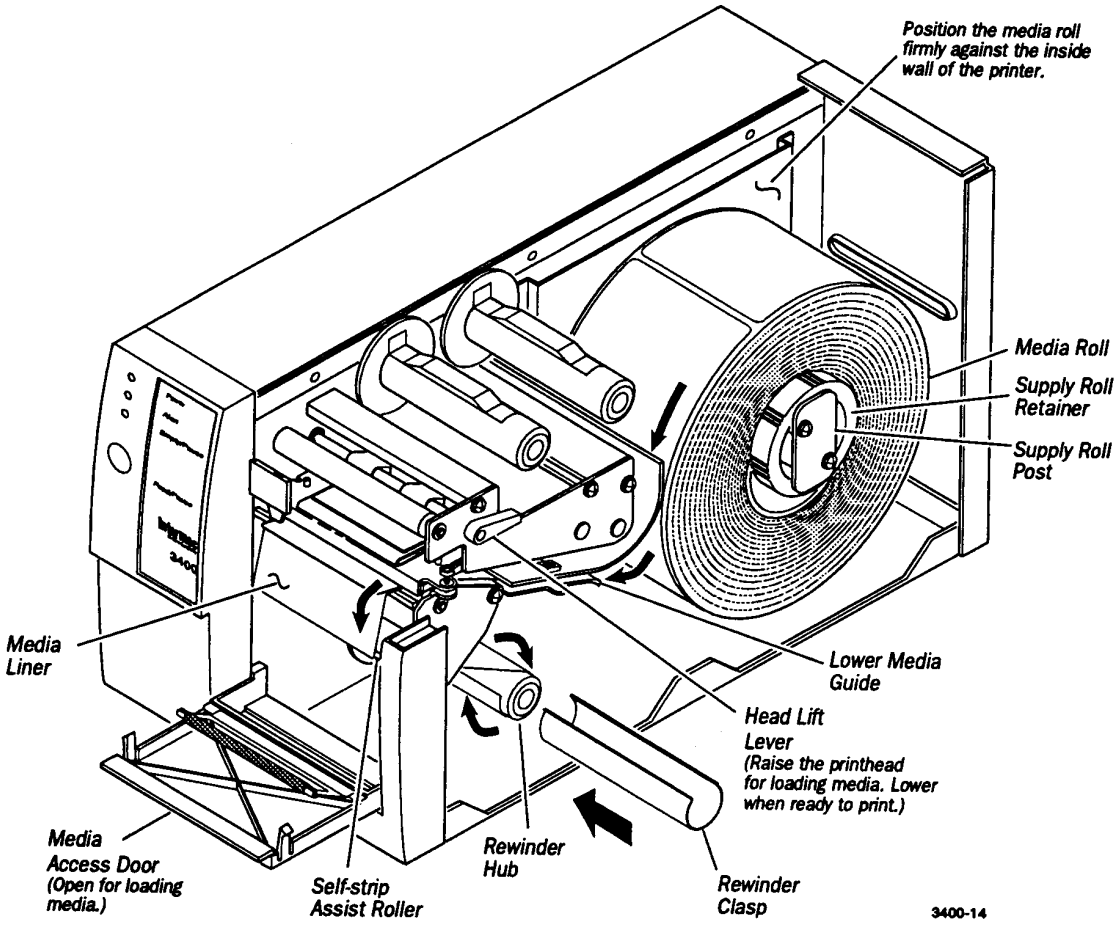
Self-strip printing is used in applications where you want to apply labels to a surface immediately. After printing a label, the printer presents the label with the backing removed. The backing is collected on the rewinder hub after passing over the self-strip assist roller. The rewinder hub can hold the backing for an entire roll of media.

1. Open the printer.
2. Raise the printhead by rotating the head lift lever clockwise until the printhead disengages.
3. Turn the supply roll retainer counter-clockwise to release it and slide it to the outer end of the supply roll post.

Note: If you are replacing the empty media roll with a new roll of the same width, you do not need to adjust the edge guide.

4. Place the media roll on the supply roll post and position it firmly against the inside wall of the printer.
5. Slide the supply roll retainer up to the edge of the media roll and turn the supply roll retainer clockwise to tighten.
6. Pull down on the lower media guide to allow easy access to the media path. Make sure that the edge guide is slid all the way to the outer edge of the lower media guide.

Loading Media for Self-strip Printing



7. Insert the label stock through the printer mechanism as shown.

8. Release the lower media guide and adjust the edge guide to position the media firmly against the inside wall of the printer.

9. Pull out 8 to 10 inches of media and remove the exposed labels from the media liner.

10. Open the media access door and thread the media liner under the self-strip assist roller and over the rewinder hub in a clockwise direction.

11. Remove the clasp from the rewinder hub and wind a few inches of media liner clockwise onto the rewinder hub. Secure the media to the rewinder hub by snapping the rewinder clasp onto the rewinder hub. Turn the rewinder hub clockwise to increase the tension on the media liner passing over the tear-bar.

12. Lower the printhead by rotating the head lift lever counter-clockwise until it locks.

13. Close the media access door.

14. Send down the **(<SI>t)** command to enable self-strip and the label taken sensor. If you are working from a PC using DOS, enter the following command:

```
MODE COM1:  96,E,7,1,N (if not set) [Enter]

COPY CON COM1: [Enter]
<STX><SI>t1<ETX>^Z ([Ctrl] + [z]) [Enter]
```

Where:

MODE COM1: 96,E,7,1,N configures the serial port.

COPY CON COM1: copies the information to COM1:

<SI>t1 enables the self-strip option.

^Z ([Ctrl] + [z]) sends the command to the printer.

15. Press [**FEED/RELOAD**] to advance a label through the printer. Grasp the leading edge of the label where it has separated from the backing and pull it away from the printer.

16. Close the printer. The printer is now ready for printing.

Loading Thermal Transfer Ribbon

If you plan to print in thermal transfer mode, you must install a thermal transfer ribbon on the ribbon supply hub after you install the thermal transfer media.

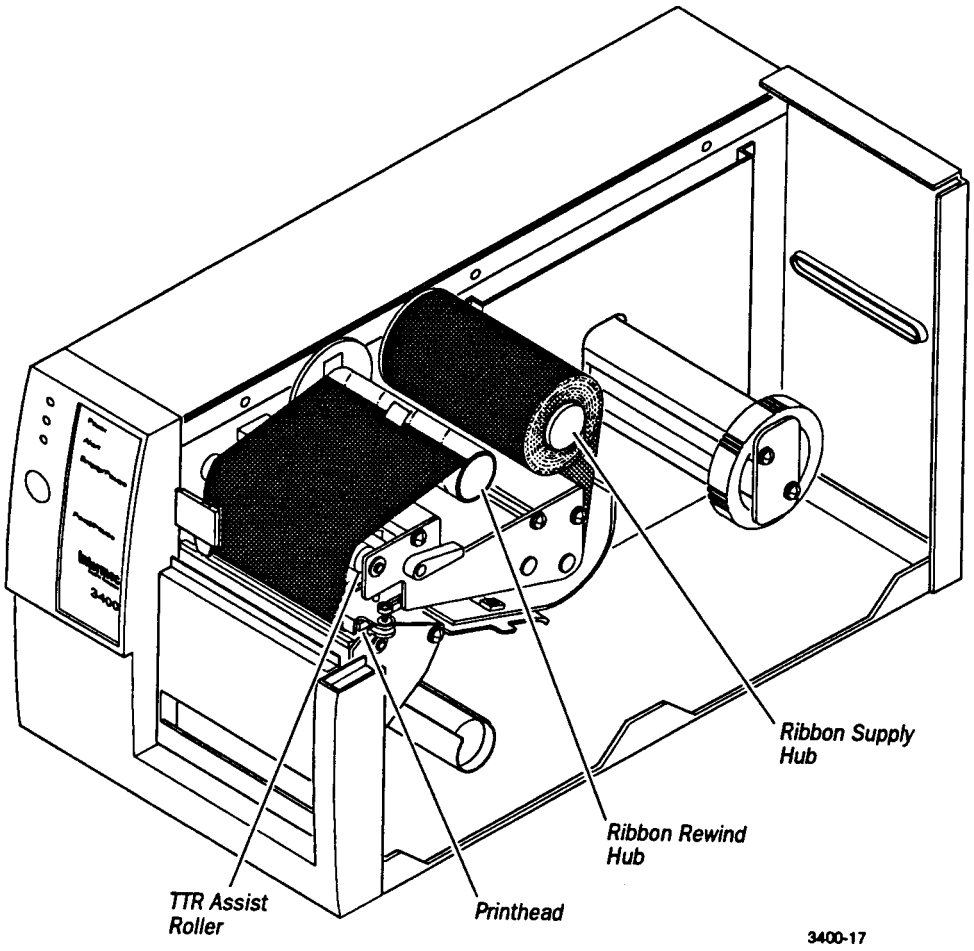
1. Ensure that the printhead is raised. If not, turn the head lift lever clockwise until it releases the printhead.

2. Place the empty ribbon core (that came with the printer) onto the ribbon rewind hub and slide the roll of thermal transfer ribbon onto the ribbon supply hub.

3. Detach the leader from the new thermal transfer ribbon roll and route the ribbon through the print mechanism as shown in the following figure.

Note: Make sure the ribbon runs above the upper media guide. The shiny side of the ribbon must come in contact with the printhead.

Loading Thermal Transfer Ribbon



4. Attach the leader from the new thermal transfer ribbon roll to the empty ribbon core using a piece of tape. Wind the ribbon rewind hub clockwise until the ribbon runs smoothly through the printhead mechanism.
5. Engage the printhead by rotating the head lift lever counter-clockwise until it locks.
6. Enable thermal transfer printing by setting DIP switch 8 on the bottom bank of switches to the ON position.
7. Close the printer. The printer is now ready to print.

Note: When replacing the thermal transfer ribbon roll in the future, use the empty ribbon supply core as the new rewinder core.

Setting Media Sensitivity

When you load media into the printer, you should check to see that the sensitivity rating for the media matches the rating set in the printer. The sensitivity rating consists of **3 digits**, and is printed on each media roll or box. When you set the sensitivity in the printer to match the rating for your media, the amount of energy the printhead uses is adjusted to a value that is suitable for your media. This improves the print quality and sets the darkness to an appropriate level.

To check your media sensitivity rating, print out a software configuration label.

The *default setting* of media sensitivity for direct thermal media on the 3400 printer is ***420***. The default setting for thermal transfer media is ***567***. Please refer to the following media sensitivity table for a complete list of media types and their sensitivity settings.

Setting the Sensitivity Rating for Your Media

You only need to enter the first digit to set the approximate rating for your media.

The **1st digit** (in the hundreds place, 1xx) designates the range of sensitivity for your media.

The **2nd and 3rd digits** (x23) are used to fine-tune the printhead energy to improve print quality and label darkness.

Setting the Sensitivity for Thermal Transfer Media

The sensitivity rating on each roll of Thermal Transfer media or ribbon has an asterisk (*) in place of one of the digits. On Thermal Transfer media, the rating contains the 1st and 2nd digits, with an asterisk in place of the 3rd digit because this digit is reserved for ribbon. The rating on the ribbon has the first and third digits, with an asterisk in place of the second digit because this digit is reserved for media.

For example, you may see 56* on the media and 5*7 on the ribbon. In this case, fine-tuning of the printhead requires that you set the sensitivity rating to **567**.

Setting media sensitivity is done with the configuration command <***SI***>***g***. For example, if you are sending down commands from a PC using DOS, enter the following commands to set the sensitivity number to **567**:

```
MODE COM1:  96,E,7,1,N (if not set) [Enter]
COPY CON COM1: [Enter]
<STX><SI>g1,567<ETX>^Z ([Ctrl] + [z]) [Enter]
```

Where:

MODE COM1: 96,E,7,1,N configures the serial port.

COPY CON COM1: copies the information to COM1:

<SI>g1,567 sets the printer to thermal transfer media and the sensitivity number to **567**.

^Z ([Ctrl] + [z]) sends the command to the printer.

If you are using another platform to communicate with the printer, see section on, "Printer Commands" for information on using this command.

Communicating With the Printer

You are now ready to print labels by downloading data from the host to the 3400 printer. **Downloading** is the universal term used to describe the transfer of information from the host to any connected peripheral device, such as the 3400 printer. When you transfer data from your printer to the PC or host, you are performing a process called **Uploading**.

Regardless of your choice of a platform (host terminal or PC), there are several methods that you can use to download information. The following paragraphs describe different ways to communicate with the printer.

Using the Printer Command Set

You can also create labels by downloading formats (designs) and data created with the printer command set (refer to section on, "Printer Commands" for a complete list of printer commands and their descriptions). The commands in the printer command set can perform any function or activate any feature of the 3400 printer except for those features/functions that are set with the DIP switches. The following methods may be used to download commands.

Downloading Printer Commands Using DOS

To download commands with DOS, you must connect the printer to the serial port on your PC using the correct Intermec cable , and you must configure the serial port using the DOS Mode command. Type in a command similar to the following from the DOS prompt (replace COM1: with the serial port used):

```
MODE COM1: 96,E,7,1,N [Enter]
```

The DOS Copy and Print commands commonly use the hardware flow control (Ready/Busy) communication protocol. To use this protocol, the printer must be in Ready/Busy mode (which is the factory default configuration). Enter the commands into a text file using a text editor or a word processor and save the file as an ASCII text file. See your DOS User's Manual for more information. Send the file to the printer with the following DOS commands:

```
COPY (filename) COM1: [Enter]
PRINT (filename) [Enter]
```

Where:

`(filename)` is the name of your text file.

The **`COPY`** command copies the file to serial port 1 (COM1) of your PC.

The **`PRINT`** command sends your text file to LPT1 unless redirected.

Using the DOS copy command allows you to use files stored on the PC. If necessary, these files can be modified and downloaded several times. For example, if your first attempt at a label format does not work, you can return to the text editor, change the incorrect commands, then download the format again. By using this method, you eliminate the need to retype command strings that do not change.

Using ASCII Control Characters or Hexadecimal Equivalents

With many communications or terminal emulation software, you create the commands by using the equivalent ASCII control characters. For example, <ETX> is entered as [Ctrl] + [C].

When ASCII decimal equivalents are entered in a word processor, they display on the screen as special characters. For hexadecimal equivalent (<STX> = 02), consult the pull-out ASCII chart in the Appendix.

Using Printable Control Characters

There are 2 ways that you can enter ASCII text characters using most text editors or word processors: **1)** control codes
2) printable control characters

Many word processors have the ability to represent ASCII characters such as <ETX> by entering a control code. Refer to the User's Manual of your word processor for details.

If it is difficult for you to edit or transmit command files containing control characters, you may want to utilize the printable control characters feature. To use this feature, type the ASCII characters in as a string. Angle brackets around ASCII strings are used to represent these characters. For example, if you want to enter the ASCII mnemonic for Start of Text, type the control character out as a readable character string: <STX>. The printer automatically detects whether you are using regular control characters or printable control characters on a record by record basis. Refer to the ASCII chart in the Appendix for a complete listing of the control characters and their readable protocol/command character equivalent.

All characters in a message must be in the same form as the start of text (<STX>) character. For example, if you include regular control characters in a message that begins with the printable control character <STX>, the regular control thrown away. Using printable control characters may consume character is more space and time, but it has the distinct advantage of displaying everything on the screen in readable characters.

When using printable control characters, any response or upload from the printer will be in printable control character form.

Downloading Printer Commands Using PC Programs or a Host Terminal

Another way to download commands to your printer is through a PC communications program, a terminal emulation program, or a host terminal. In any of these situations, the commands you enter through the keyboard are sent immediately to the printer in real time. The only drawback of using this sort of program is that your mistakes are sent to the printer in real time as well.If you make an error while entering commands, you must retype the command string instead of just editing it. This inconvenience can be minimized by keeping your command strings short. Design your formats as combinations of several short command strings rather than one very long string.

For example, the following format can be sent to the printer in one of two ways. The first example shows the format organized into several short command strings. The second example shows the same format sent to the printer as one long command string.

Example 1 - *every field is a separate record*

```
<STX><ESC>P<ETX>
<STX>E3;F3;<ETX>
<STX>H0;o81,100;f0;c0;d0,16;h1;w1;<ETX>
<STX>H1;o81,120;f0;c0;d0,16;h1;w1;<ETX>
<STX>H2;o81,150;f0;c2;d0,14;h1;w1;<ETX>
<STX>H3;o81,190;f0;c2;d0,16;h1;w1;<ETX>
<STX>B4;o81,0;f0;c0,1;h50;w1;d0,11;i0;p@;<ETX>
<STX>R<ETX>
```

Example 2 - *complete format is one record*

```
<STX><ESC>P;E3;F3;H0;o81,100;f0;c0;d0,16;h1;w1;H1;o81,1
20;f0;c0;d0,16;h1;w1;H2;o81,150;f0;c2;d0,14;h1;w1;H3;o8
1,190;f0;c2;d0,16;h1;w1;B4;o81,0;f0;c0,1;h50;w1;d0,11;i
0;p@;R<ETX>
```

In the first example, each line begins with the start of text character <STX>, and finishes with the end of text character <ETX>. If you make a mistake, you only need to retype the line with the mistake. In the second example, if you made a mistake anywhere in the string, you must retype the entire format. Thus, you can see the advantages of keeping your command strings short.

Note: When ASCII decimal equivalents (control characters) are entered in a word processor, they display on the screen as special characters.

Switching Between Print & Program Mode

Print Mode and Program Mode are two different operating modes of the 3400 printer. Before you download information to the printer, make sure that you are in the correct mode.

- Use program mode to define formats, pages, fonts, and characters.
- Use print mode to download data and print labels.

Select program mode by entering:

<STX><ESC>P<ETX>

It is a good practice to send this command every time that you download formats, even if you think the printer is already in program mode. If the printer is in program mode, the command is ignored.

Select print mode by entering:

<STX>R<ETX>

Enter this command before each set of data or as your last format command. If the printer is already in print mode, this command is ignored.

Note: Besides being used to pass data, print mode is also used to download configuration commands for the printer.

Printing a Test Label

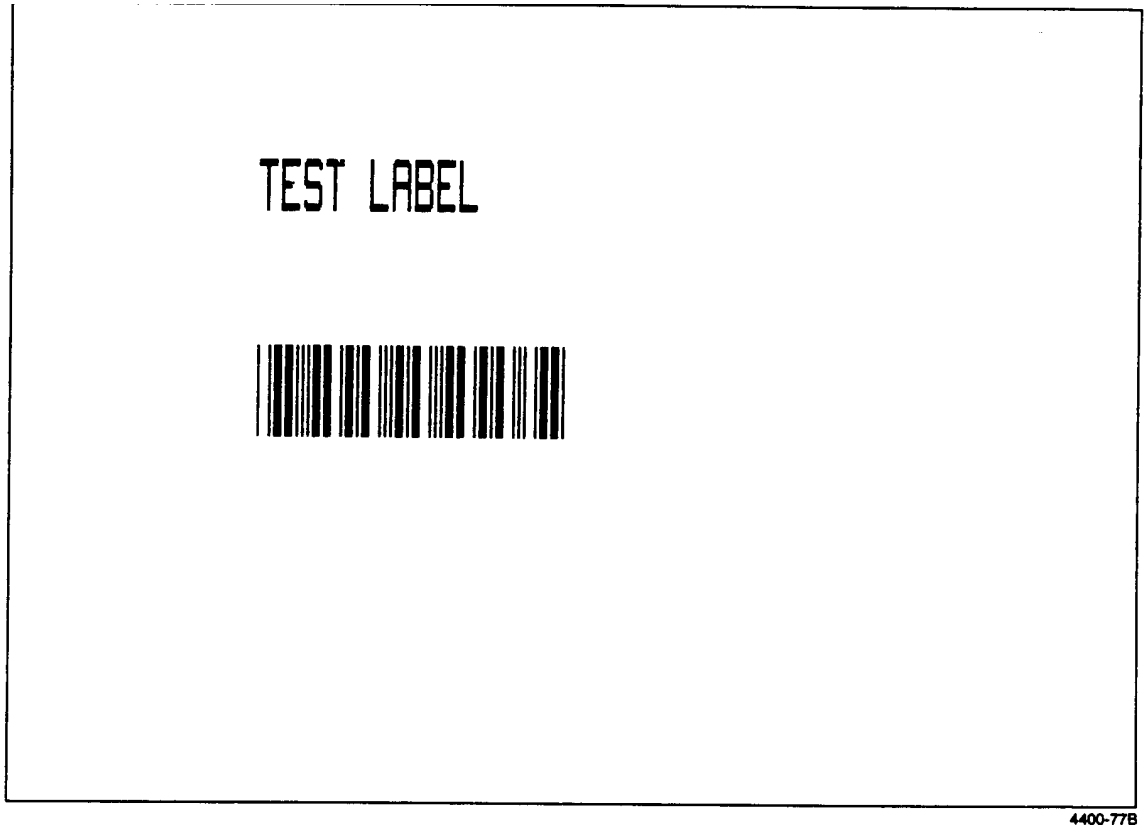
If you would like to test your communications by downloading a label, follow the example below. Use DOS editor to create the following label format and save it under the file name "**TEST**":

```
<STX><ESC>C<ETX>
<STX><ESC>P<ETX>
<STX>E4;F4;<ETX>
<STX>H0;o240,150;f0;c2;h4;w2;d0,30;<ETX>
<STX>B1;o240,350;c0,1;h100;w3;i0;d0,11;p@;<ETX>
<STX>R<ETX>
<STX><ESC>E4<ETX>
<STX><CAN><ETX>
<STX>TEST LABEL<CR><ETX>
<STX>TEST<ETX>
<STX><ETB><ETX>
```

Exit to the DOS prompt and type the following command line:

COPY TEST COM1:

The 3400 printer should print out a label similar to the test label below:



3400C IPL3 Enhancements

☆ New configuration command for Mirror and Inverse printing, called 'Printhead Loading Mode Select'. The command is <SI>hn.[m].

Selects the printhead loading mode that affects how the whole image prints on the label. Mirror Printing mode reverses the order in which data loads into the printhead. Inverse Printing mode causes all pixels that are white to invert to black and vice versa.

Syntax: <SI>h*n*[,*m*]

Printers:

Printer	Defaults	Values for n	Values for ,m
3400C	n = 0 ,m = 0	0 - Selects normal printing 1 - Selects Mirror Printing mode	0 - Selects normal printing 1 - Selects Inverse Printing mode
3440	n = 0 ,m = 0	Same as 3400C	Same as 3400C
3600	N / A	Same as 3400C	Same as 3400C
44X0	n = 0 ,m = 0	Same as 3400C	Same as 3400C
7421	n = 0 ,m = 0	Same as 3400C	Same as 3400C

Note: The printhead is not under warranty if you use Inverse Printing mode for batch printing. Intermec does not recommend using Inverse Printing mode for batch printing. For best results with Inverse Printing mode, apply Inverse Printing mode to only a portion of a label and use a maximum print density of 35 percent.

☆ New online test and service commands for printing the hardware configuration label and the software configuration label. These commands are: <STX><ESC>T;h;R<ETX> and <STX><ESC>T;s;R<ETX> respectively. Other online test and service commands are also available like; pitch label <STX><ESC>T;C;R<ETX>, and the print quality label <STX><ESC>T;Q;R<ETX>.

☆ UPC version D, Code 1 and Test and Service Cloning were removed from the printer.

☆ Store up to 19 formats and use disposable formats. Store up to 99 in 3440, 4420/4440.

☆ Data Matrix barcode has been added.

Data Matrix Symbology versions ECC-100 and ECC-200

c17[,*m1*][,*m2*][,*m3*,*m4*[,*m5*,*m6*]]

Selects Data Matrix.

Data Matrix is a 2D matrix symbology which is made up of square modules arranged within a perimeter finder pattern. The finder pattern is a perimeter to the data region and is one module wide. Two adjacent sides are solid dark lines. These lines are used to define physical size, orientation, and symbol distortion. Intermec supports these two versions of Data Matrix: ECC-100 and ECC-200. Use ECC-200 for new applications.

This table lists the defaults:

Parameter	Default	Description
,m1	200	ECC-200
,m2	0	Square
,m3	0	Position of current symbol in group
,m4	*,m3*	Total number of symbols in group
,m5	1	File identifier
,m6	1	File identifier

,m1 is a three-digit number that selects the Data Matrix version. Possible values are:

,m1 = 100 ECC-100
,m1 = 200 ECC-200

,m2 is a one-digit value that indicates whether your symbol will be square or rectangular. The amount of data you enter determines the size of the symbol. Possible values are:

0 = square
1 = rectangular

Use *,m3*, *,m4*, *,m5*, and *,m6* when you define Structured Append symbols within ECC-200.

Parameter	Description	Possible Values
,m3	The position of the current symbol in the group	0 - 16
,m4	The total number of symbols in the group	0 - 16
,m5	File identifier	1 - 254
,m6	File identifier	1 - 254

For example, if you set *,m3,m4,m5,m6* to 2,5,1,43 you are indicating that the current symbol definition is the second in a group of 5 with the file identifier of 1,43.
If you do not set *,m3* or you set it to 0, you disable Structured Append mode. If you do not set *,m5* or *,m6*, the settings default to 1,1.

☆ Printer language selection has been improved with GLOBE.

Printer Language, Select

Purpose: Selects the printer language.

Syntax: `<SI>l`*n*

Where *n* specifies the language. Possible values for *n* include:

0 – USA
1 - United Kingdom
2 – Germany
3 – Denmark
4 – France
5 – Sweden
6 – Italy
7 – Spain
8 - 8-Bit ASCII
9 – Switzerland
10 - Code Page 850
11 - Code Page 1250, Central Europe
12 - Code Page 1251, Cyrillic, Russian
13 - Code Page 1252, Latin 1, Western Europe
14 - Code Page 1253, Greek
15 - Code Page 1254, Turkish
16 - Code Page 1255, Hebrew
17 - Code Page 1256, Arabic
18 - Code Page 1257, Baltic Rim
19 - Code Page 1258, Vietnamese
20 - Code Page 874, Thai
30 - Code Page 932, Shift JIS, Japanese
31 - Code Page 936, GB 2312-80, Simplified Chinese
32 - Code Page 949, KSC5601, Korean Hangeul
33 - Code Page 950, Big 5, Traditional Chinese

Notes: You can only use one language per print job.

☆ Disposable Formats. Used with the format select command.

Purpose: Selects a format for data entry or printing.

Syntax: <ESC>E*n*[,*m*]

Where *n* is the numeric format ID and ,*m* specifies to reimage only changed fields.

Printers:

Printer	Default	Values for n	Values for ,m	Notes
3240	n = 0	0 to 99	0 - the printer reimages the entire label. 1 - the printer only reimages the changed fields.	
3400A, 3400B	n = 0	0 to 19	Same as 3240	
3400C	n = 0	*, 0 to 19	Same as 3240	If you use an asterisk (*) for the label format, the printer stores the label format in RAM.
3440	n = 0	*, 0 to 99	Same as 3240	If you use an asterisk (*) for the label format, the printer stores the label format in RAM.
3600	n = 0	0 to 19	Same as 3240	
4100	n = 0	0 to 19	Same as 3240	
4400	n = 0	0 to 19	Same as 3240	
44X0	n = 0	*, 0 to 99	Same as 3240	If you use an asterisk (*) for the label format, the printer stores the label format in RAM.
4X30	n = 0	0 to 99	N / A	The ,m parameter is not available on the 4630 and 4830 printers.
7421	n = 0	*, 0 to 99	Same as 3240	If you use an asterisk (*) for the label format, the printer stores the label format in RAM.

Note: If you select a page other than 0, *n* is an alphabetic format position within the page with a range from a to z. After you select the format, the field pointer points to the lowest numbered data entry field.

Note: The printer must be able to completely image a label, within the available number of image bands, for the reimaging command to work and retain the image. The printer starts imaging the label as soon as it receives the command to select a format.

The printer clears all host entered / variable data from this format.

The printer generates an error code (36) if you enter an invalid format number.

☆ Direct Graphics Mode. Use of direct graphics mode can increase throughput by overlaying graphics on a format in memory. Cleared when 1) calling another format, 2) sending <CAN>.

What Is Direct Graphics Mode?

You can significantly reduce the amount of time necessary to download and image a graphic by using Direct Graphics mode. Direct Graphics mode allows the printer to receive a compressed bitmap graphic and image it directly into the image bands without storing it in the printer.

Before you download the graphic, you must compress it into run-length encoded (RLE) data. The data compression greatly reduces the amount of data to download and the rasterized graphic requires minimal processing to image it into the image bands. You no longer need to store the graphic in Program mode and then set up a format in Print mode.

When you download a direct graphic to the printer, the printer stores the graphic in the image bands until you:

- clear the label data.
- set up another format.
- enter Program mode or Test and Service mode.

When printing a label with direct graphics, you must have enough dynamic RAM installed in your printer to contain the entire label. Intermec printers normally reuse image bands which enables you to print long labels with standard RAM. However, when you download direct graphics, the printer retains no information regarding the existence of the graphic in its image bands. Therefore, the printer cannot reuse those image bands when you download a direct graphic.

With standard dynamic RAM, you should be able to print almost any label up to 6 inches long. For longer labels you may need to install expanded dynamic RAM.

What Is Run-Length Encoding?

Run-length encoding (RLE) is a method of compressing bitmap graphics. RLE efficiently compresses graphics that have repeated runs of white or black dots in a column and reduces the amount of time required to download the graphics to a printer.

RLE sends a series of commands that define each bitmap column of a graphic. It takes advantage of a series of repeated dots within a column by encoding them as transition commands. Instead of sending the entire column of bitmap data, it sends commands telling the printer how many series of black and white dots to image.

If columns are identical, a command can instruct the printer to repeat the last column. RLE is ideal for bar code graphics or designs with simple patterns.

In cases where patterns do not exist, you can send uncompressed bitmap data to the printer. You can mix raw bitmap data and RLE commands to ensure the most efficient way to download a graphic.

The RLE file may contain five types of data, each of which is one byte long:

Immediate commands Immediate commands are recognized and executed as regular IPL commands or protocol commands. Immediate commands are removed from the compressed data.

Compression encodation commands Compression encodation commands are used as a part of the compressed graphics file to change or set data modes, repeat lines, change the origin where the next line or lines of data will print, and to end the compressed graphics file and return to IPL command parsing.

Low order data Low order data is 7 bits in length and may be combined with high order data. A single low order data byte can represent up to 7 bits of data (0-127). Combined with a high order byte, the combined data can represent at most 13 bits of data (0 - 8191). Data bytes cannot exist by themselves, but must be preceded by a command byte so that the printer knows how to interpret them. Any data may be represented by either combined data or just low order data. The 8th bit is always set to 1.

High order data High order data is six bits in length and is always combined with low order data. The combined data can represent at most 13 bits of data
(0 - 8191). Data bytes cannot exist by themselves, but must be preceded by a command byte so that the printer knows how to interpret them. Any data may be represented by either combined data or just low order data. The printer will ignore high order data followed by a command or more high order data. You must set the 7th bit to 1 and the 8th bit to 0.

Bitmap data Bitmap data is composed of uncompressed bytes that represent columns of your graphic. The uncompressed bytes contain 7 data bits per byte. The 8th bit is always set to 1.

Use this table to understand how the printer uses these five types of data:

Type of Data	Byte Format (7 - 0)	Range	Data it Represents
Immediate commands	0 0 0 x x x x x	0 - 31	N/A
Compression encodation commands	0 0 1 x x x x x	32 - 63	N/A
Low order data	1 x x x x x x x	128 - 255	0 - 127
High order data	0 1 x x x x x x	64 - 127	0 - 63
Bitmap data	1 x x x x x x x	128 - 255	Raw data

How Do I Send a Direct Graphic to the Printer?

Once you have compressed the graphic, you need to use several IPL commands to send the RLE file to the printer. These are the commands accompanied by their descriptions:

Direct Graphics Mode, Enter

Purpose: Instructs the printer to receive RLE compressed graphics data in nibblized format.

Default: *m* = 0

Syntax: <ESC>g*m*

Where *m* specifies the format of the data to follow.

m = 0 8 bits per byte.

m = 1 7 bits per byte of nibblized data.

When you select *m* = 0, the printer parses subsequent data streams as RLE commands. The printer still recognizes immediate IPL commands. Non-immediate commands are not parsed. The printer resumes normal IPL parsing when it receives an end of bitmap RLE command.

When you select *m* = 1, the printer receives the RLE compressed graphics data in nibblized format. The printer converts each pair of bytes from ASCII to their numerical equivalent and then combines them to form the original byte. For example:

ASCII	Numerical	Original byte
1,B	0x1,0xB	0x1B

Change Origin

Purpose: Tells the printer the X and Y coordinates of the next RLE data column.

Default: 0,0

Syntax: `0x21[x,y]`

Where *x* and *y* are the coordinates of the next data column. Values for *x* and *y* range from 0 to 8191.

The change origin command tells the printer where to place the graphic on the label. If you do not sent the command, the printer uses the default setting of 0,0.

You can use the command to place different sections of the RLE graphic in different parts of the label.

Notes: It is not necessary to use this command for every column. Column-to-column transitions are automatic following the end of line command.

The default origin of any direct graphic (0,0) is in the lower left corner instead of in the upper left corner. The upper left corner is the label format origin.

End of Bitmap

Purpose: Marks the end of RLE encoded data.

Syntax: `0x28`

Notes: The printer parses subsequent characters as IPL commands. On the final column of the RLE encoded data, an end of line command does not need to precede the end of bitmap command.

End of Line

Purpose: Causes the printer to assign subsequent bitmap data to the next column.

Syntax: `0x22`

Notes: The printer images the next data stream in the next column position, incrementing the X position. This command causes an action similar in function to a carriage return.

Raw Bitmap Data Follows

Purpose: Indicates raw bitmap data bytes follow.

Syntax: `0x27[`*`data`*`]`

Notes: The printer only uses the first 7 bits of the data byte. If you set a bit to 1, it prints black. The most significant bit prints farthest to the left. Data order runs from right to left, so the first dot in a column is the least significant bit of the first data byte.

Repeat Last Line

Purpose: Causes the printer to copy the previously defined column *n* number of times.

Syntax: `0x24`*`n`*

Values for *n* range from 0 - 8191.

Notes: The printer automatically increments the X origin of each column. This command is only valid when preceded by a column of encoded, raw data, or an end of line command.

Transition Black

Purpose: Transition data follows. The first transition is black.

Syntax: `0x25[`*`data,data,...data`*`]`

Where *data* specifies the number of black or white dots. Values for *data* can range from 0 - 8191.

Notes: Each transition data specifies the number of dots of either black or white to draw. Each data alternates black and white dot counts.

Transition White

Purpose: Transition data follows. The first transition is white. .

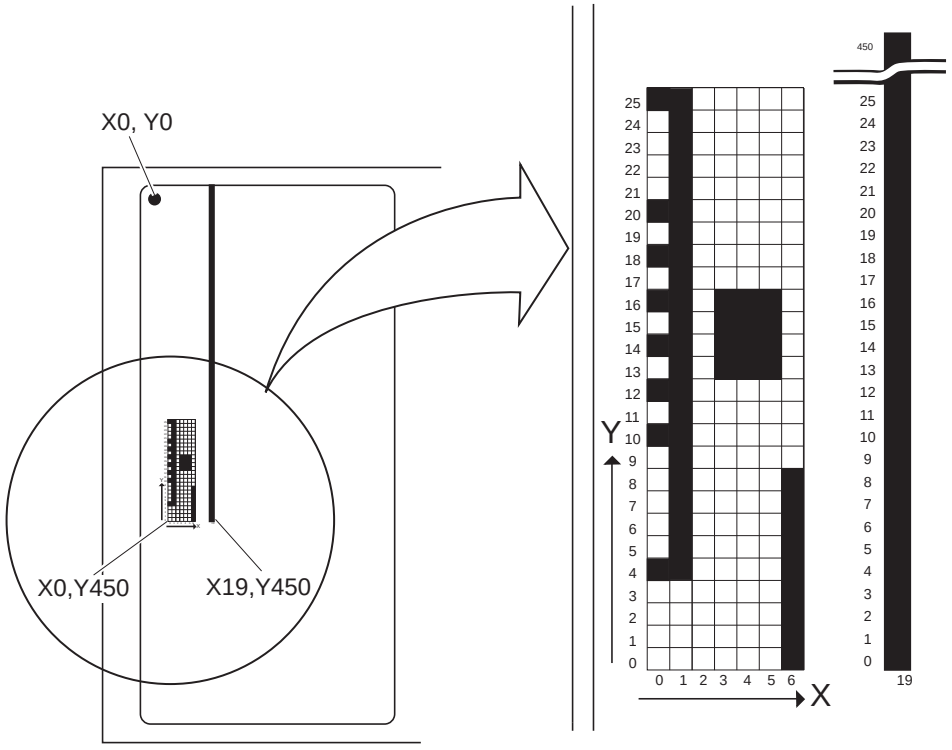
Syntax: `0x26[`*`data,data,...data`*`]`

Where *data* specifies the number of black or white dots. Values for *data* can range from 0 - 8191.

Notes: Each transition data specifies the number of dots of either black or white to draw. Each data alternates black and white dot counts.

Using Direct Graphics Commands

This example consists of two parts: a graphic and a line. The origin of the direct graphic is defined the same as the origin of a normal graphic. In this example, the coordinates for the origin of the complicated graphic are X0,Y450. However, once you enter Direct Graphics mode, your printer loads the information in the reverse Y direction. Each column of the graphic loads from the bottom to the top. Your Y coordinates now start at 0 from the bottom left corner and increase in size as the data loads. So, the printer starts loading data for the complicated graphic at X0,Y450 and loads up to X0,Y425. Likewise, the data for the line starts loading at X19,Y450 and loads up to X19,Y0.



3440A.001

Here is a hex data file for the example above:

1B	67	30	21	80	43	C2	27	90	A8	D5
90	22	26	84	96	22	22	26	8C	84	22
24	82	25	88	22	21	93	43	C2	25	43
C2	28									

This table explains the hex data file in the example:

Data	Command	Description
1B 67 30	<ESC>g0	Enter Direct Graphics mode
21 80 43 C2	0x21	Change origin
	80	80 - 80 (LO) = 0x00 -> X0
	43 C2	43 - 40 (HI) = 0x03 C2 - 80 (LO) = 0x42 (0x03 * 0x80) + 0x42 = 1C2 -> Y450
27 90 A8 D5 90 22	0x27	Raw bitmap data follows, starts at Y0
	90	90 - 80 (LO) = 0x10 -> 1 dot at Y4
	A8	A8 - 80 (LO) = 0x28 -> 2 dots at Y10 and Y12
	D5	D5 - 80 (LO) = 0x45 -> 3 dots at Y14, Y17, and Y20
	90	90 - 80 (LO) = 0x10 -> 1 dot at Y25
	0x22	End of line
26 84 96 22	0x26	Transition white
	84	84 - 80 (LO) = 4 white
	96	96 - 80 (LO) = 22 black
	0x22	End of line
22	0x22	End of line
26 8C 84 22	0x26	Transition white
	8D	8D - 80 (LO) = 13 white
	84	84 - 80 (LO) = 4 black
	0x22	End of line
24 82	0x24	Repeat last line
	82	82 - 80 (LO) = 2 times
25 88 22	0x25	Transition black
	88	89 - 80 (LO) = 9 black
	0x22	End of line
21 93 43 C2	0x21	Change origin
	93	93 - 80 (LO) = 0x13 -> X19
	43 C2	43 - 40 (HI) = 0x03 C2 - 80 (LO) = 0x42 (0x03 * 0x80) + 0x42 = 1C2 -> Y450
25 43 C2	0x25	Transition black
	43 C2	43 - 40 (HI) = 0x03 C2 - 80 (LO) = 0x42 (0x03 * 0x80) + 0x42 = 1C2 -> Y450
28	0x28	End of bitmap

Factory Default Settings

The following table lists the factory default settings for the 3400 printer. These parameters are set using downloadable printer commands described in the section 1. The printer's serial port defaults, which are set using the rear panel DIP switches, are described at the beginning of this manual.

Configuration:	Default Setting:
Preamble character	Disabled
Postamble character	Disabled
Auto-transmit 1	Disabled
Auto-transmit 2	Disabled
Auto-transmit 3	Disabled
Message Delay	0 milliseconds
Power-up mode	Advanced mode
End-of-print skip distance	100 dots
Top of form	20 dots
Media sensitivity	420
Number of image bands	3
Maximum label length	1000 dots or 5 inches
Printer character set	US ASCII
Label retract	Enabled
Print speed	3 inches per second (ips)
Label stock type	Die-cut
Inter-character delay	0 milliseconds
Protocol selection	Xon/Xoff
Baud rate	9600
Parity	Even
Data bits	7
Stop bits	One
Multidrop address	A
Media type	Direct thermal

Fonts and Graphics

The internal fonts of the 3400 printer include:

- 4 standard bitmap fonts measured in dot sizes **(5 x 7, 7 x 9, 7 x 11, and 10 x 14).**
- 2 bitmap OCR fonts. Fonts that can be recognized by optical character recognition (OCR) programs.
- 3 bitmap fonts measured in point sizes **8**, **12**, and **20** (1 point equals 1/72 of an inch).
- Outline font (**C25**) is available on the 3400A with Version 1.2 firmware and the Expanded 128K memory Option. Outline font is standard on the 3400B.
- The 3400B has 12 monospace bitmap fonts from 6 to 36 point (1 point equals 1/72 of an inch).

User-defined Fonts

User-defined fonts (UDFs) can be downloaded to the 3400 printer and stored in the battery backed static RAM. Font ID numbers 3 to 6 and 8 to 19 are reserved for user-defined fonts. Although the printer provides the ability to define and store up to 16 fonts, memory constraints may limit the number of fonts that can be stored.

Bitstream outline fonts can also be downloaded to a 3400A with version 1.4 or greater firmware and expanded RAM, or the 3400B.

Downloading Fonts

If you are using Intermec Label™ Design software, you can purchase additional bitmap fonts and download them to the printer as long as they are compatible with Hewlett Packard Laserjet II™ printers. For more information on the fonts available and the procedure for downloading them, consult the Label User's Manual.

If you are not using a label design software package, download bitmap fonts using the 3400 commands. The characters in the font must match the one bit per byte or six bits per byte format.

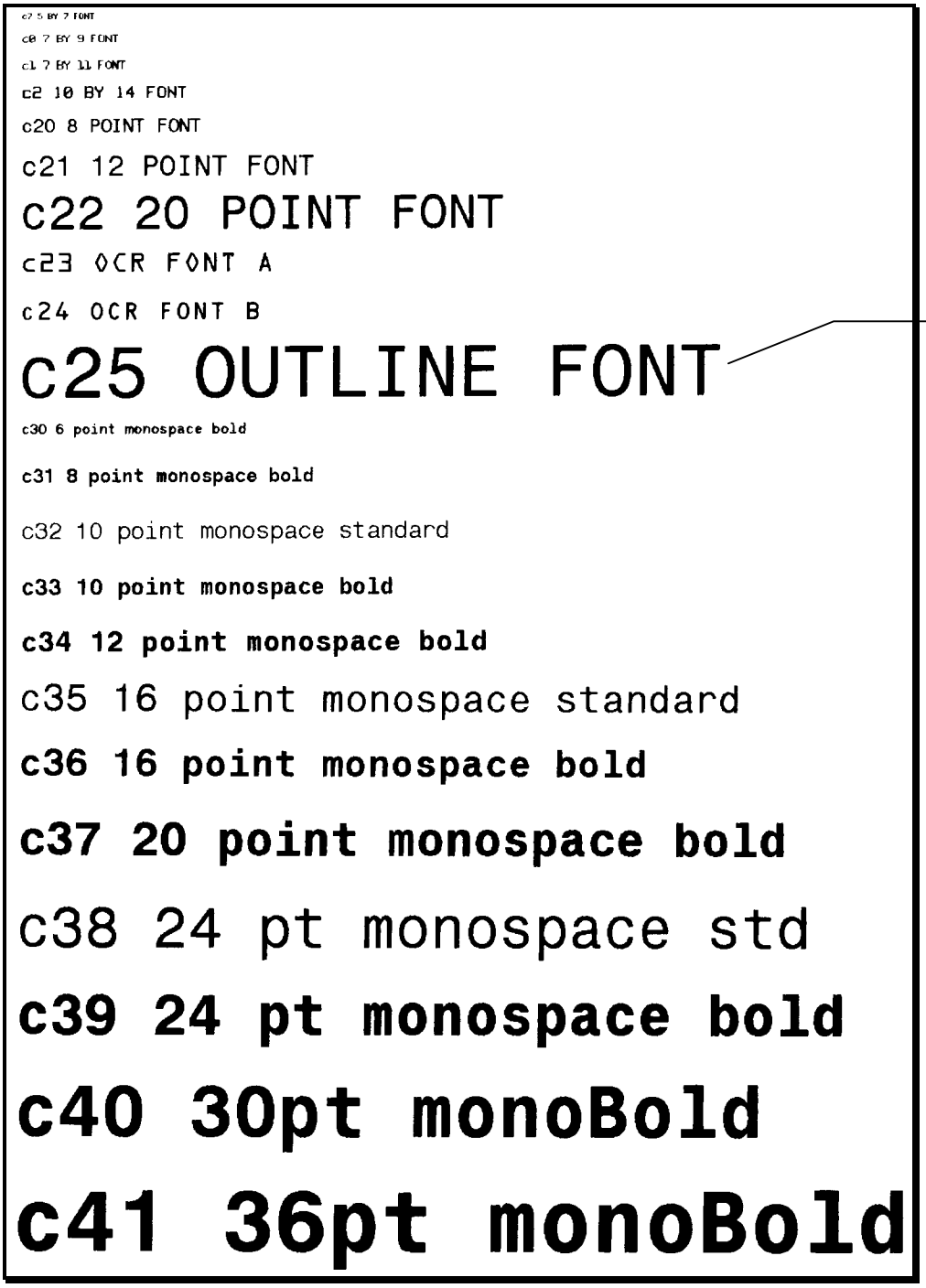
TrueType fonts can be downloaded to the printer using the utilities included in the file ***TT2PRN.ZIP***, located on the Intermec Product Support Bulletin Board (206-356-1811).

Graphics

A graphic field is used to print a graphic image on a label. Before you can use this field, you must download the graphic to the printer. Once the graphic is downloaded, you can use it in any format. Graphics must be formatted for downloading as either a one bit per byte or six bits per byte bitmap image.

The maximum size that you can define a graphic to be is 4 inches by 4 inches (800 dots by 800 dots).

Examples of the 3400 printer's resident fonts are shown:



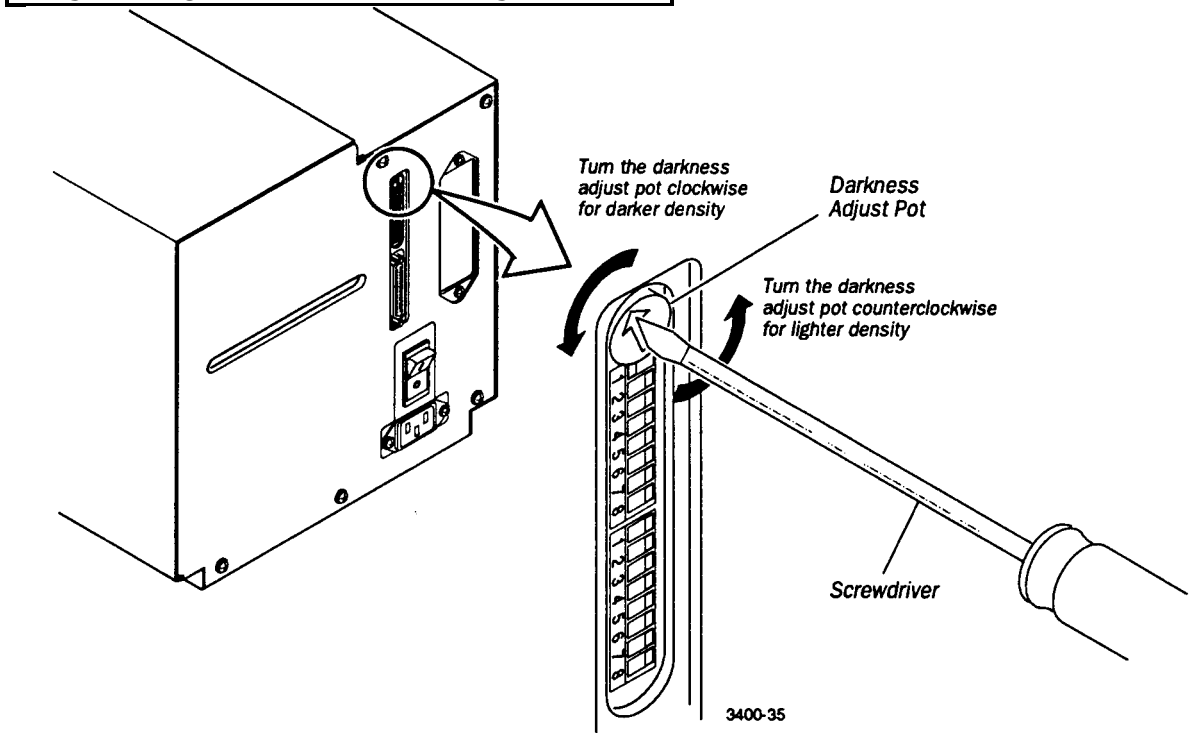
Outline font resident with 128k of Storage RAM

Setting the Darkness Adjust

The dark adjust pot allows the user to optimize print quality by changing the energy level of the printer after entering the proper sensitivity number. It is a fine adjust to allow you to compensate for "lot to lot" variations in the media , the printhead, or the printer. The darkness adjust pot is similar to that on a copier. It is located on the back of the printer and requires a small blade screwdriver to adjust.

Use the dark adjust pot in combination with the **dark adjust command <*SI*>*d*** to fine tune the darkness of print on your labels. Increase the darkness by turning the darkness adjust pot clockwise. Turning the darkness adjust pot counter-clockwise decreases the darkness.

Adjusting the Darkness Adjust Pot

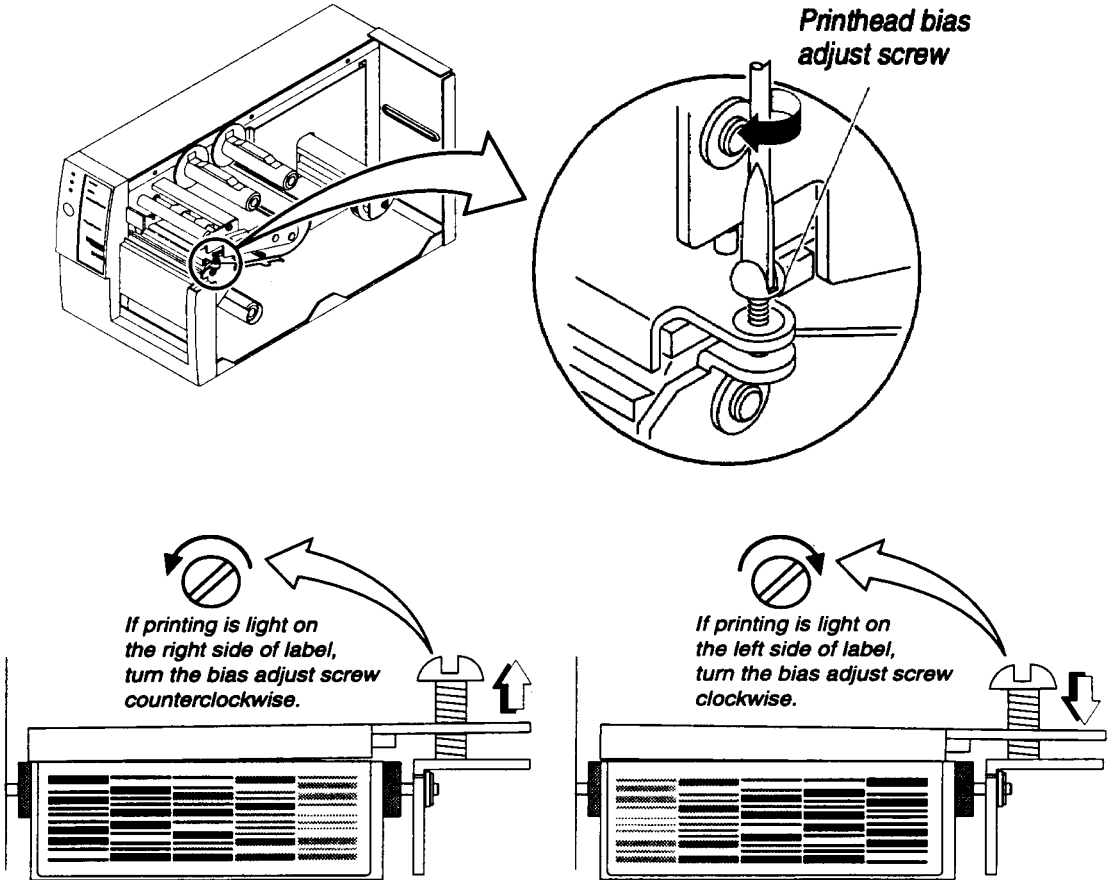


The Bias Adjust Screw

You may experience problems in print quality if the printhead is not making even contact with the label stock. This can happen with any size label stock, but is most common when using narrow label stock.

To compensate for uneven print contrast (density), turn the bias adjust screw clockwise. This adjustment causes the printhead to rest evenly on the drive roller resulting in even print quality. The following figure illustrates how to use the bias adjust.

Using the Bias Adjust Screw



Printhead Adjustment Lever

The printhead adjustment lever is located at the back of the printhead assembly where the printhead pivot shaft is secured with a cotter pin.

The neutral position for the lever is straight down with 3 notched positions to the left and to the right. Each position of the lever moves the fore/aft position of the printhead by 0.006 inch. Adjusting this lever will influence print quality.

Communication Problems

Preventing Data Loss

There are a variety of reasons that can cause data loss or communication problems on the 3400 printer. Data loss can result in printing errors or missing field data. The following paragraphs contain background information on printer communications, communications problems, and possible solutions.

The 3400 printer is a serial ASCII device. It communicates with the host through an ASCII serial communication I/O port. The printer communicates by using hardware and software handshaking. The two devices communicate with each other without losing data through the use of handshaking.

Hardware handshaking uses pins 11 or 20 of the RS-232 interface to control data flow. When the printer is using Intermec "standard" protocol, pins 11 and 20 are held high when the printer is ready to receive data. These line go low when the printer is in one of the following conditions:

- Buffer full
- Ribbon fault
- No label stock
- Label at strip pin

The 3400 printer uses ***XON/XOFF protocol*** for software handshaking. When the input buffer is full, the printer transmits an XOFF (<DC3>) character. This alerts the host to the fact that the printer buffer is full and cannot receive any more data. When the printer is ready to receive more data, it sends the XON (<DC1>) character.

Use the following steps to check for communication problems:

1. Check the cabling from the printer to the host system.
2. Check the interfacing of the devices that are communicating with the printer.
3. Check the printer for proper electrical operation of the I/O port.
4. Test to see that the host system is not overrunning the printer's input buffers.
5. Check to see that the data string being sent to the printer contains the correct information.

3400C Hardware Handshaking Jumper

Pin 11 and Pin 20 (DTR) are connected together at the factory. On the 3400C, J2 on the main pcb. can be used to disconnect Pin 20 from Pin 11. If J2 has the top two pins connected, Pin 11 and Pin 20 are connected together. If J2 has the bottom and middle pins connected, Pin 20 is always HI and is no longer connected to the hardware handshaking pin, Pin 11.

How the 3400 RAM is Utilized

There is enough RAM in the printer to store several different label formats and still retain enough memory to store downloaded fonts, graphics, and data. Be careful of how you use your printer memory.

The 3400 printer uses static RAM for imaging and storing tables, pages, formats, fonts, and user-defined characters (UDC's). For a printer with ***32K*** of static RAM installed, the default amount allocated for storage RAM is ***20K***. A 3400 with 128K of storage RAM has a default of 60K allocated for storage.

A *configuration command* ***<SI>N*** has been added for the user to adjust the amount of RAM allocated for storage purposes. The amount of storage RAM can be adjusted from 10K to 32K without the addition of the expansion RAM option.

Adjusting the amount of Storage RAM

When you run into a memory usage problem, use the ***Transmit Storage Area Usage*** <ESC>m ***command*** to see how much memory remains available. After sending the (<ESC>m) command, the printer uploads information on the amount of storage **RAM allocated** and the amount of allocated **RAM unused**. The two numbers are separated by a comma. For example, the printer might send back the following: **32,10**. If you find that it is necessary to increase your available memory, you can do one of the following:

- Use the configuration command ***<SI>N*** to adjust the amount of RAM allocated for storage purposes. A printer with 32K of static RAM installed can adjust the amount of RAM allocated for storage from 10K to 32K. For printers with expanded RAM installed, the amount of storage RAM can be adjusted from 10K to 128K.
- Use the Memory Reset portion of the Test and Service menu to increase the amount of available memory in part or all of the sections.
- The commands used to create a font/UDC can be used to delete them as well :

Bitmapped fonts:	**Tn** without any following data deletes bitmap font n.
UDC's:	**Gn** without any following data deletes UDC n.

- Use the program commands to delete pages and formats:

Pages:	Delete a page with the **s**n command.
Formats:	Erase format n by using the **E**n command.

- Purchase additional memory. Please contact your Intermec Customer Service Representative for information on purchasing additional memory for the 3400 printer.

3400C Upgrade SRAM to 512K

To upgrade the SRAM storage memory from 128k to 512k:\

1 – Remove the old 128k SRAM from the main pcb., location U6.

2 – Install the new 512K SRAM into location U6.

3 – Change the jumper J3. Print out the hardware configuration label in Test and Service mode.

Test and Service

Test and Service mode on the 3400 printer allows you to print test labels and provides printer hardware diagnostic information to the host (when using online test and service mode).

To enter Test and Service mode, power on the printer while pressing the [Feed/Pause] button. The printer prints out the hardware configuration label then enters data line dump mode. Set the DIP switch settings to select the desired test and press the [Feed/Pause] button for one second.

The printer remains in Test and Service mode until the power is turned off again and the DIP switches are reset. All functions are executed as soon as they are selected. Selecting a new function terminates the current test.

Test and Service Mode Procedure

To select a printer test or service operation, perform the following steps:

1. Press down and hold the [**FEED**/**PAUSE**] button while powering on the printer. The printer prints out a hardware configuration label.
2. Set the DIP switches to the test or service function you wish to perform. See the preceding tables for a list of the DIP switch settings.
3. Hold the [**FEED**/**PAUSE**] button down for one second. The test begins immediately.
4. If you wish to perform another function, change the DIP switch settings and hold the [**FEED**/**PAUSE**] button for one second. The function currently being executed is terminated and the new function is performed.
5. To exit Test and Service Mode, cycle the printer power.

Note: Press the Feed/Pause button to start a new test.

Be sure to return all DIP switches to their original settings after completing the configuration tests and before powering the printer on.

Printer Maintenance

Even though the 3400 printer is designed to withstand harsh environments, it must be cleaned on a regular basis to keep it running at its highest performance level. It is very important to perform the maintenance procedures if the printer is exposed to dirt or debris. This section contains cleaning procedures and a schedule detailing how often to perform them.

Inspecting the Printer

Inspect the printer and the rest of your data collection system equipment on a regular basis. Your inspection should include the following:

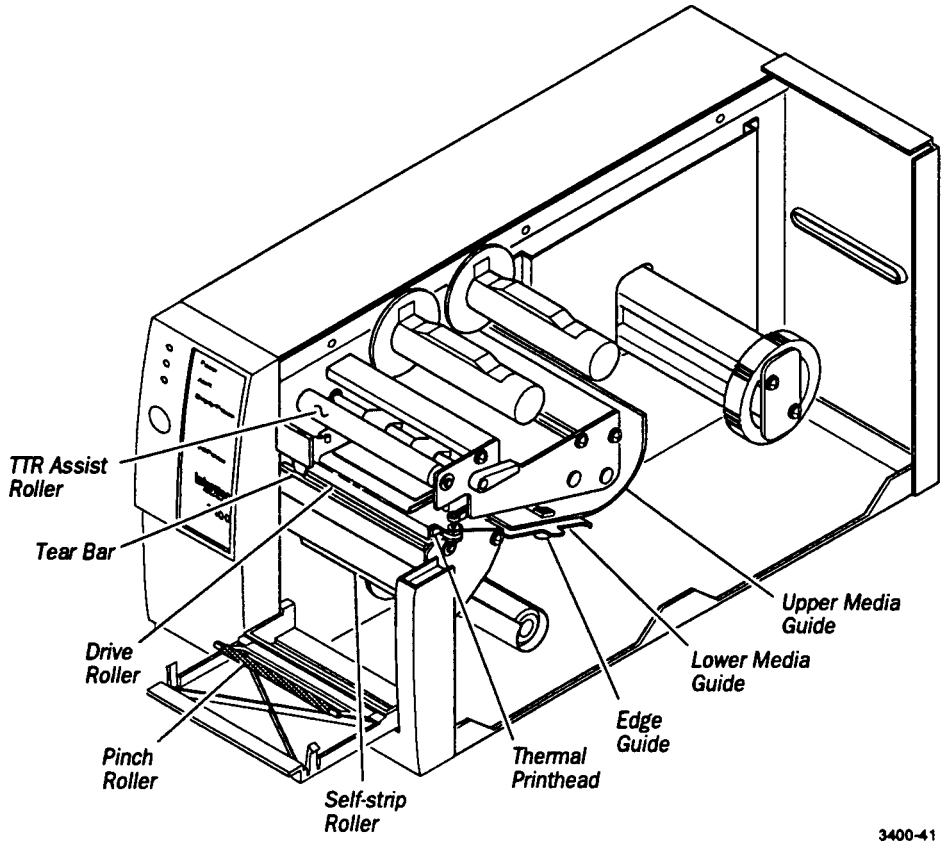
- Make sure the printer is properly grounded.
- Inspect the work environment. Large electric motors, welders, and switching equipment can affect printer performance. See Section on "Installing the Printer," for guidelines on appropriate environments.
- Keep the printer away from liquids.
- Check the data collection network regularly for loose wires or poorly installed connections. Be sure to replace corroded wires.

Maintenance Schedule

Clean your printer regularly to maintain the quality of your labels and extend the life of your printer. To clean the printer safely and effectively, use the following items:

- Isopropyl alcohol
- Cotton swabs
- Clean lint-free cloth
- Vacuum cleaner
- Soapy water/mild detergent

Location of Parts to be Maintained



Printer Component	Maintenance Period
Printhead	Inspect after every roll of media. Clean after every **2 rolls or 12,000 inches** of media, or as necessary.
Drive Roller and **Tear Bar** **Media Path** **Edge Guide and Media Guides** **TTR Assist Roller** **Self-strip Roller** **Pinch Roller** **Label Sensors**	Clean after every **5 rolls of media**. The use of hi-tack adhesive requires cleaning after every roll of media. If you are using tag stock or continuous media, you may want to clean after every 5 rolls of media or as necessary. Clean more often in environments that are harsh or dusty.
Printer Cover	Clean as necessary.

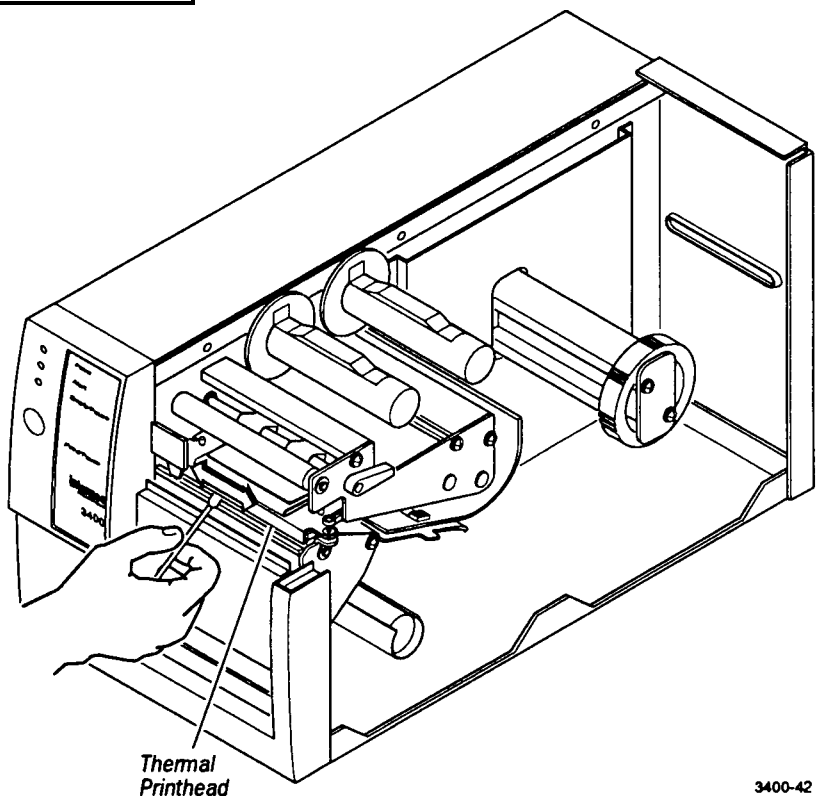
Cleaning the Printhead

In order for the printhead to provide good print quality, it must maintain close contact with the media. Therefore, cleaning media debris from the printhead is very important. Clean after every 2 rolls or 12,000" of media or when necessary.

To clean the printhead, perform the following steps and refer to the accompanying illustration.

1. Remove the media cover.
2. Disengage the printhead by rotating the head lift lever clockwise until the printhead releases. This raises the printhead to allow for cleaning.
3. Remove the media from the paper path and ribbon hubs.
4. Use a cotton swab moistened with alcohol to remove any dirt, adhesive, or debris from the print surface on the bottom of the printhead. Wait five to ten seconds for the print surface to dry. Replace the media.
5. Engage the printhead by rotating the head lift lever counter-clockwise until it locks in place.
6. Replace the media cover.

Printhead Cleaning

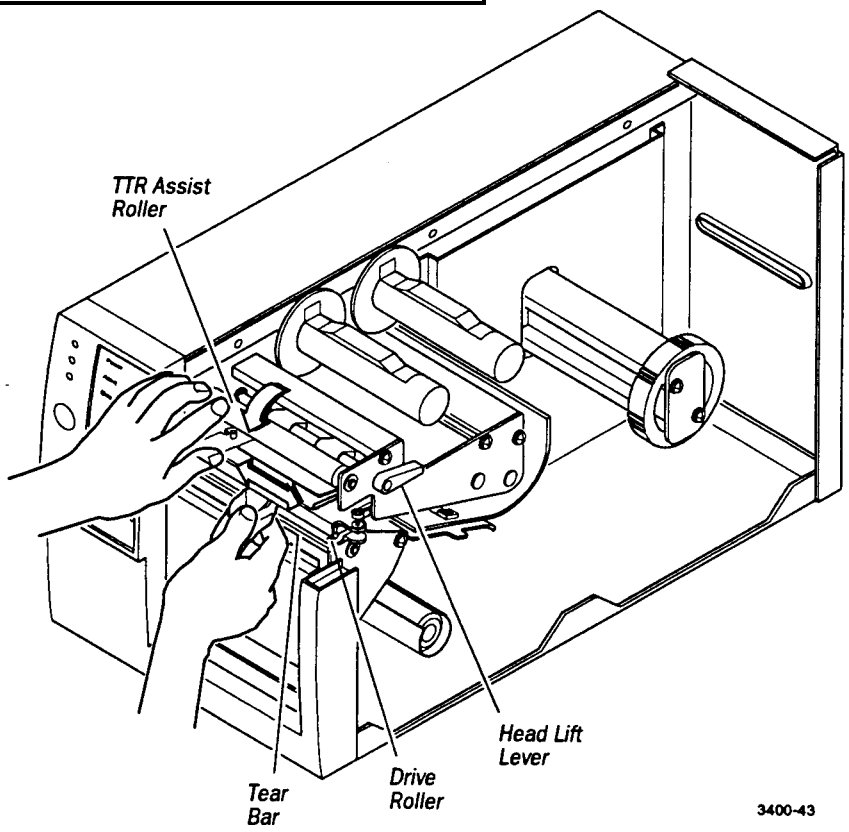


Cleaning the Drive Roller and Tear Bar

Cleaning the drive roller and tear bar preserves print quality by maintaining close contact between the media and the printhead.

1. Remove the media cover.
2. Disengage the printhead by turning the head lift lever clockwise until the printhead releases.
3. Clean the drive roller by using a cloth dampened with isopropyl alcohol. Move the cloth over the drive roller in a side-to-side motion as illustrated in the figure below. Make sure to rotate the roller so that you can clean all areas. Rotating the TTR assist roller towards you enables you to clean the entire drive roller surface.
4. Clean both sides of the tear bar with a cloth dampened with isopropyl alcohol. Remove all traces of dust, paper, and adhesive.
5. Engage the printhead by turning the head lift lever counter-clockwise until the printhead locks.
6. If you are finished cleaning, replace the media cover.

Drive Roller and Tear Bar Cleaning



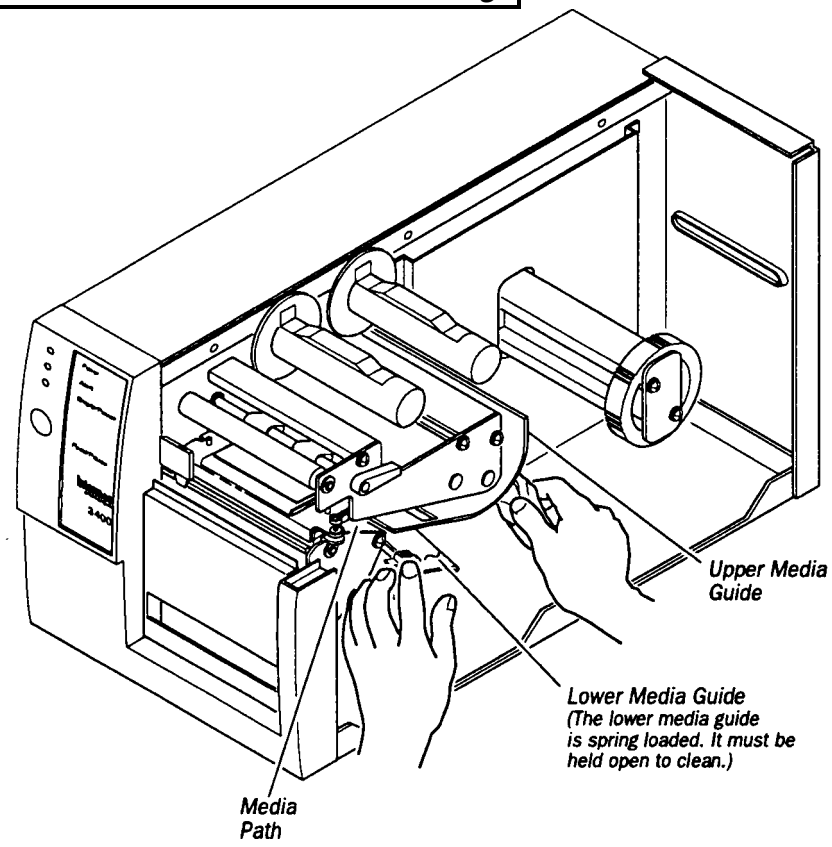
Cleaning the Media Guides and Media Path

You should clean the media guides and media path regularly to keep debris off the media surface and printhead where irregularities can spoil print quality or damage the printhead. Cleaning the guides also prevents the media from skewing or improperly tracking as it travels through the paper path. This can result in smeared images and print off the side of the label.

Always clean the media guides immediately after a label jam in the printer. Media debris may accumulate around the printer mechanism and along the media path during normal operation of the printer. This debris should be cleaned away regularly sing a soft bristle brush or vacuum cleaner. Remove all traces of dust, paper, and adhesive. Clean the flat surfaces of the media path (including the edge guide) with a lint-free cloth and isopropyl alcohol.

1. Remove the media cover.
2. Pull down on the lower media guide to open up the media path.
3. Clean the lower media guide by using a lint-free cloth moistened with isopropyl alcohol as shown in the following figure.
4. Use the cloth moistened with isopropyl alcohol to clean the upper media guide. Be sure to remove all traces of debris.
5. Release the lower media guide.
6. Replace the media cover.

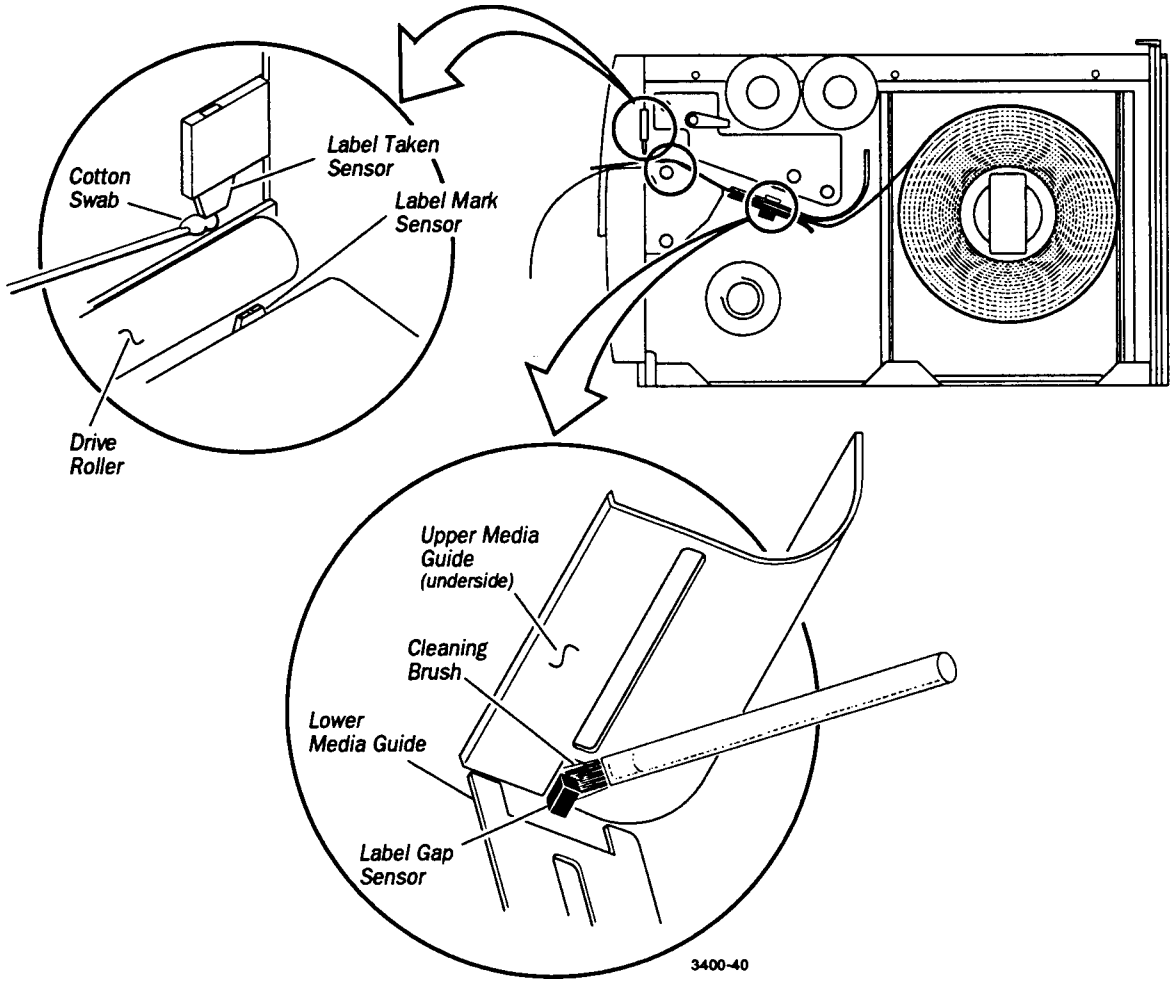
Media Path and Media Guides Cleaning



Cleaning the Label Sensors

There are three label sensors on the 3400 printer that require regular cleaning: **1)** the label taken sensor, **2)** the label mark sensor, **3)** the label gap sensor. To clean the label sensors, perform the following steps and refer to the accompanying illustration:

1. Remove the media cover.
2. Disengage the printhead by rotating the head lift lever clockwise until the printhead releases. This raises the printhead to allow access to the label mark sensor.
3. Remove the media from the paper path and ribbon hubs.
4. Clean the label taken sensor and the label mark sensor with a cotton swab moistened with isopropyl alcohol. Refer to the following illustration to locate the sensors.
5. Pull down on the lower media guide to expose the label gap sensor. Using a cleaning brush, remove all debris and dust from the label gap sensor.
6. Replace the media and engage the printhead by rotating the head lift lever counter-clockwise until it locks in place.
7. Replace the media cover.



Cleaning the Sensors

Cleaning the Printer Covers

The 3400 printer covers may be cleaned with a general purpose cleaner (soapy water/mild detergent). Do not use abrasive cleansers or solvents. Be sure to clean the transparent panel on the media cover so that the media supply inside the printer is visible when the cover is closed.

Cutter Option

With the cutter on your 3400, 4420, or 4440 printer, you can cut media into individual labels of the same or random lengths that are ready for use. The cutter blade is capable of cutting a wide range of die cut roll, continuous roll, or fanfold media; however, the cutter performs best with 7- to 10-mil thickness tag stock.

The cutter is mounted externally on the printer and cannot be used in conjunction with the self-strip/batch takeup option.

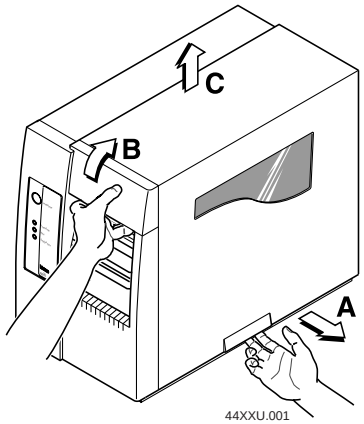
***Note**:* If you use the cutter on adhesive backed materials, cut the liner between the labels. Cutting through adhesive is not recommended. You will need to clean the cutter every 10,000 cuts or when it fails to cut cleanly if you cut through adhesive backed material*.*

Cutter Parts

Name	Description
Mounting plate	Attaches the cutter to the printer. The mounting plate has a spring mounted hinge that allows the cutter to swing down so that media can be fed easily through the cutter.
Cutter cable	Powers and sends commands from the main PCB to the cutter.
Cutter connector	Connects the cutter cable to the main PCB.
Cutter cover	Prevents fingers from coming into contact with the cutter blade. It opens easily for cleaning.
Cutter blade	Cuts the media when the printer reaches the end of the label.
Thumbscrews	Attach the mounting plate to the cutter and the cutter to the mounting plate.

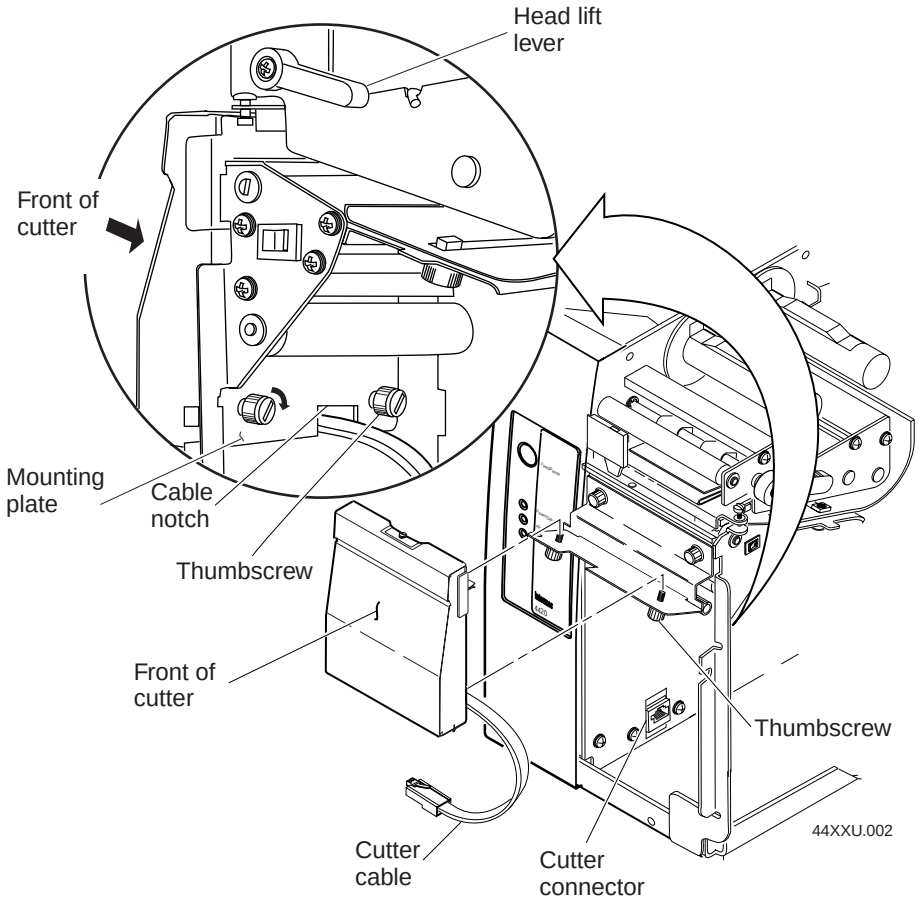
Attaching The Cutter

1. Turn off the printer.
2. Unplug the printer power supply cord.
3. Remove the media cover.
   A. Pull the bottom of the media cover away from the base of the printer.
   B. Lift the front of the media cover upward to release it from the printer frame.
   C. Lift the media cover away from the top of the printer.

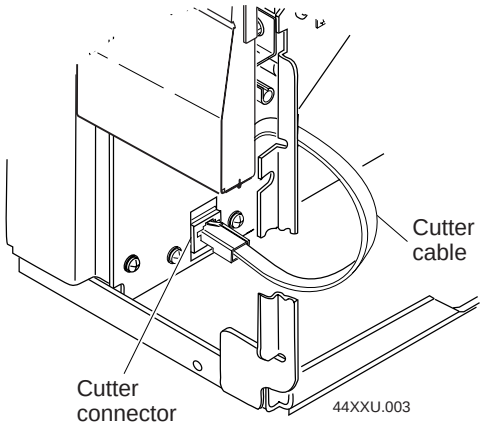


4. Turn the head lift lever clockwise and pull the media back to the printhead.
5. Push down on the mounting plate below the hinge and hold it down with the cutter pressed against the mounting plate.
6. Using the thumbscrews on the mounting plate, attach the cutter to the mounting plate. Make sure the cutter cable goes through the notch in the mounting plate.

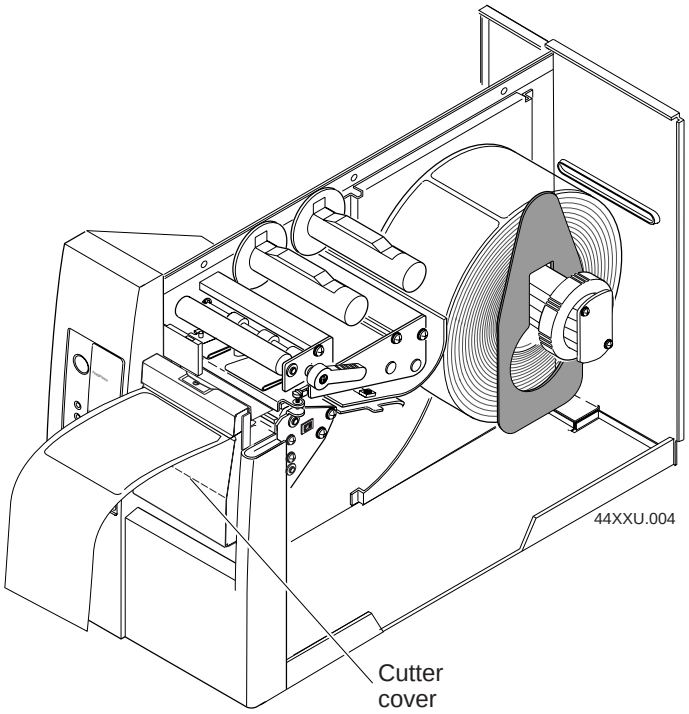
Attaching the Cutter to the Mounting Plate



7. Plug the cutter cable into the cutter connector at the base of the inside wall of the printer.



8. Feed the media through the cutter. The media should extend past the opening in the cutter cover.



9. Turn the head lift lever counterclockwise to secure the printhead.

10. Replace the media cover.

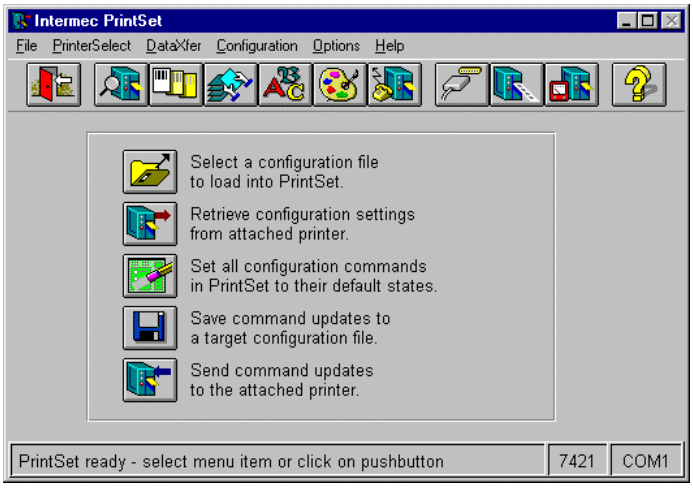
11. Plug in the printer power supply cord.

12. Turn on the printer.

Enabling the Cutter

The following instructions use PrintSet to enable the cutter, but you can also use the IPL to enable the cutter. For help, see the *IPL Programming Reference Manual.*

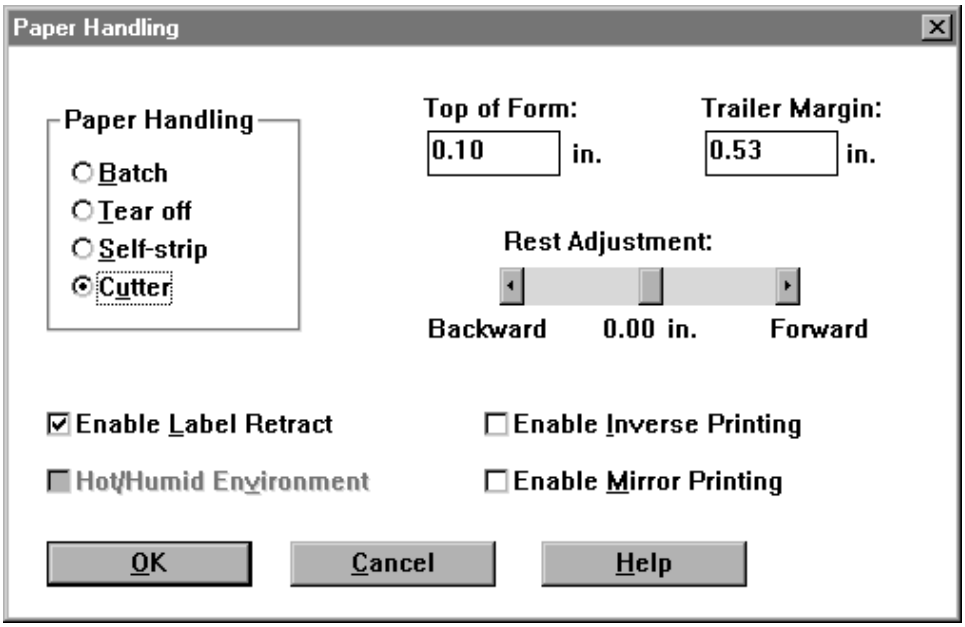
1. Start PrintSet on your PC.



Note: Under the Printer Select menu, check that PrintSet is set up for your printer [3400, 4420, or 4440]. To customize the configuration for your printer, see the Help menu.

2. Click the Paper Handling button.

3. From the Paper Handling dialog box, select Cutter.



4. Choose OK.

Note: If you want to change other configuration settings, you should do so before going to Step 5. For help changing the configuration, see the Help menu.

5. Choose the Send Command button.

A message box appears asking if you want to overwrite the current printer settings. Choose send to enable the cutter with either the default printer configuration or the configuration you have created.

6. Exit PrintSet.

Note: To disable the cutter, use this procedure but deselect Cutter at Step 3.

Cleaning the Cutter

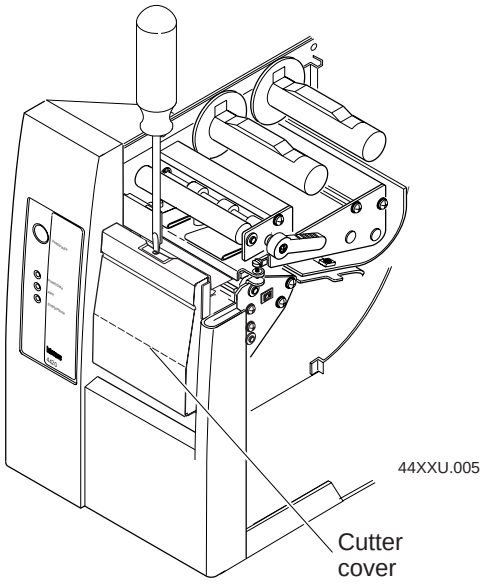
It is important that you routinely clean the cutter to keep it in excellent working condition. If you are cutting through adhesive-backed media, you should clean the cutter after every 10,000 cuts. To see the number of cuts made, print out a hardware configuration test label as described in your printer user's manual. The data following "Labels Cut" indicates how many labels have been cut since the cutter was installed. Use this number to determine when to clean the cutter.

If you are not using adhesive-backed media, you should clean the cutter when it no longer cuts precisely.

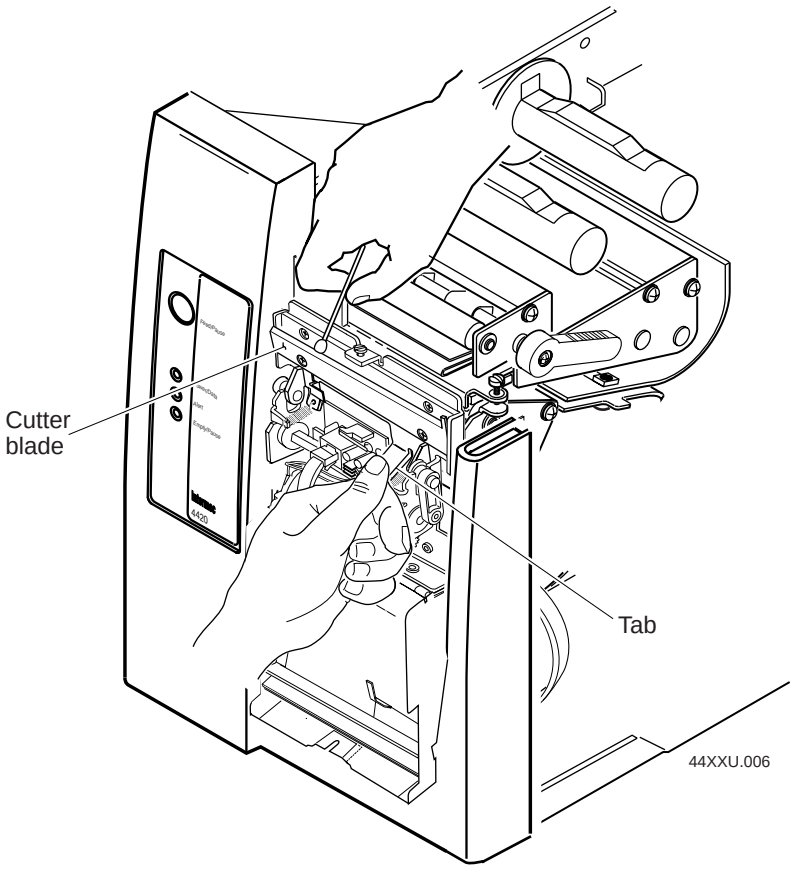
Warning ***Use extreme caution when cleaning the cutter to avoid cutting yourself.***

To clean the cutter blade and paper guide

1. Turn off the printer.
2. Unplug the printer power supply cord and the cutter cable.
3. Turn the head lift lever clockwise and back the media out of the cutter.
4. Using a straight-slot screwdriver, loosen the screw on the top of the cutter and swing the cutter cover down.



5. Push down on the tab so that the cutter blade swings forward.



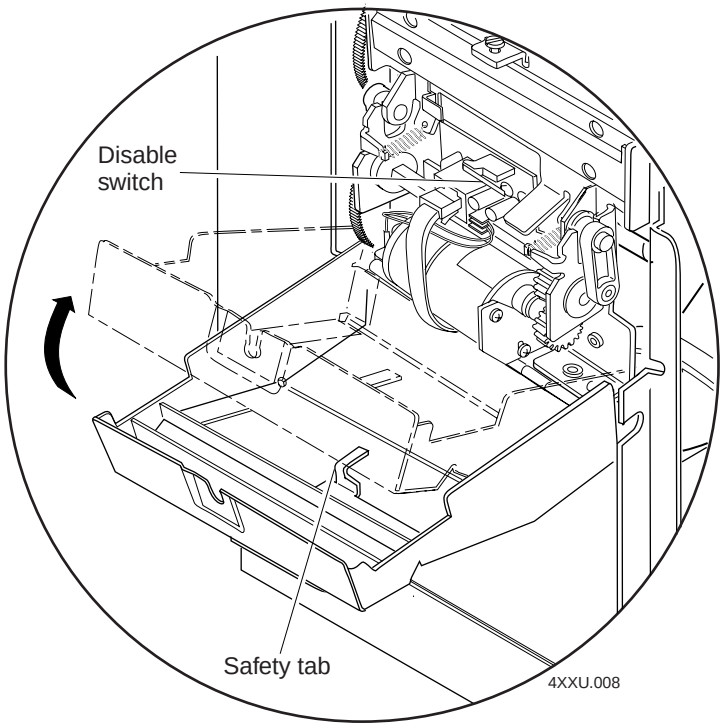
6. With a cotton swab moistened with alcohol, clean the blade.

Note: Do not clean or get alcohol on the lubricated portions of the cutter.

7. Swing the blade up.

8. Remove any dust or media debris from inside the cutter.

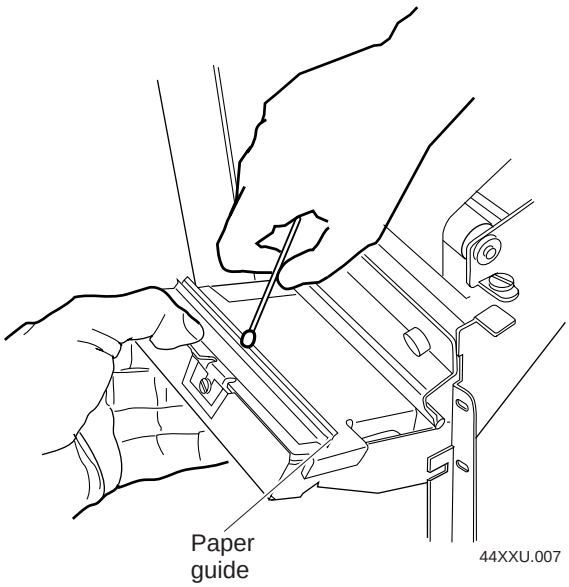
9. Close the cutter cover, you should hear a soft click. If you do not hear a click, swing the cutter cover down and gently pull the disable switch away from the cutter. The disable switch must touch the safety tab on the cutter cover for the cutter to operate.



10. With the cutter cover upright, tighten the screw on top of the cutter.

11. Pull out on the top of the cutter and swing the cutter down.

12. Clean the paper guide with a cotton swab moistened with alcohol.



13. Swing the cutter up.

14. Feed the media through the cutter. The media should extend out past the opening in the cutter cover.

15. Turn the head lift lever counterclockwise to secure the printhead.

16. Plug in the printer power supply cord and the cutter cable.

17. Turn on the printer.

Cutter Specifications

Rating	1,000,000 cuts at 0.005-inch (0.012 mm) paper thickness 500,000 cuts at 0.010-inch (0.025 mm) paper thickness
Cutting Method	Guillotine-type blade
Mounting	Attaches to the 3400C, 4420, or 4440 printer. Adds 0.5 inch (13 mm) to the printer's length.
Media Type	All types except pressure-sensitive adhesive, polyester, polyethylene, Valeron tag, or Kimdura. Kimdura is light weight and may produce a static charge causing feeding and stacking problems.
Maximum Media Thickness	0.010 inch (0.25 mm)
Minimum Liner Weight	40 lb (18.16 kg) liner
Minimum Media Width	0.75 inch (19 mm)
Maximum Media Width	4.5 inches (115 mm)
Minimum Cut Length	1.0 inch (25.4 mm)

Note: Environmental conditions like heat and humidity can affect label cutting.

Troubleshooting

This section describes some possible problems and solutions. If these solutions do not solve your problem, try the troubleshooting solutions in your printer user's manual.

Problem	Solution
The cutter does not cut cleanly or the cut end is no longer straight.	Ensure that the cutter is attached properly and that the media is tracking properly. Clean the cutter.
The cutter is jammed.	If the media is not feeding properly into the cutter or stacking up at the cutter output, check the paper tracking. Clean the cutter. Determine whether the media is too limp or distorted to track properly through the cutter.
The cutter is not cutting.	Ensure that the cutter cable is connected. Ensure that the cutter cover is fully closed and the disable switch contacts the safety tab on the cutter cover. Use PrintSet to enable the cutter. If the cutter still does not cut, make sure that your printer is communicating with PrintSet. For help, see the PrintSet online help.
The label cut length is incorrect.	Make sure the cutter is in the upright position against the printer. Ensure that the media is not binding in the media pathway. Ensure that the printer edge guides are properly positioned. Check the label rest point setting. For help, see the PrintSet online help.
Media has bent edges after the cut.	Check media tracking or try a different kind of media.

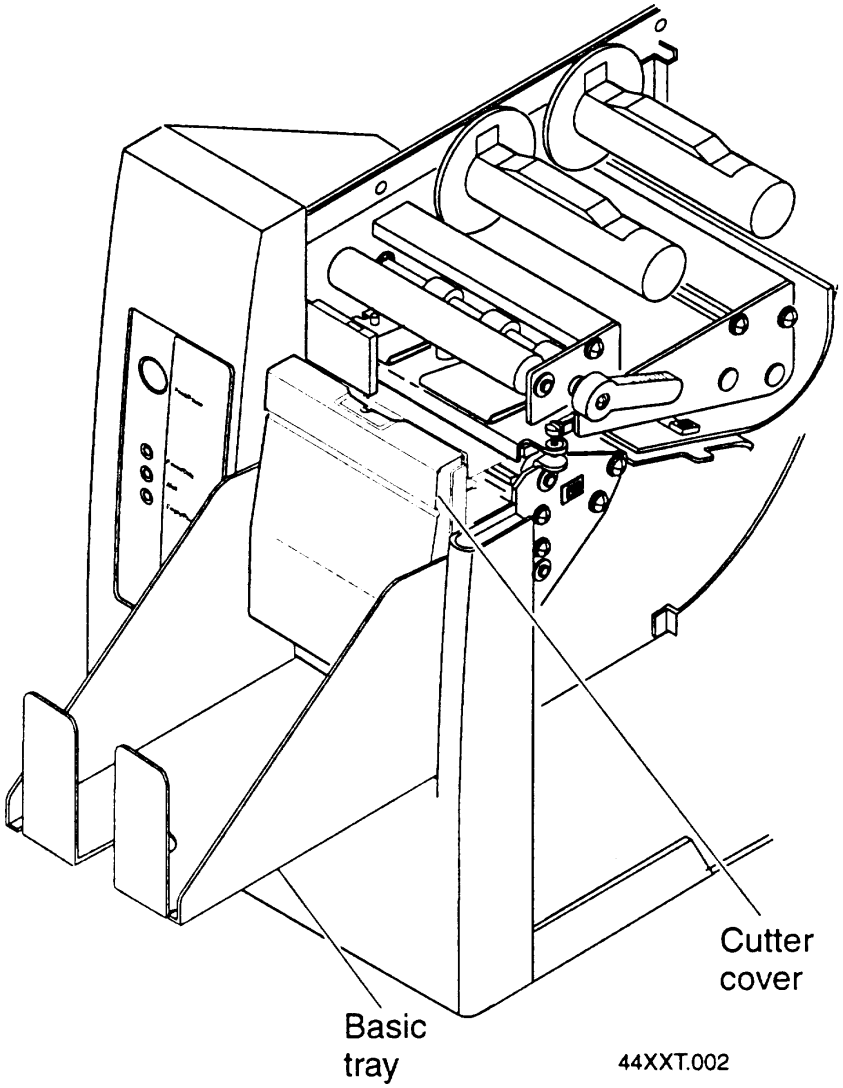
Basic and Deluxe Cutter Trays

The basic cutter tray (067324) is supplied with the cutter option. The deluxe cutter tray (066369) can be ordered as a supstitute. Both trays hook easily onto the cutter assembly but the deluxe cutter tray can be adjusted for tray angle and tray depth to match the amount of labels to be cut.

Attaching the Basic Cutter Tray

1 – Attach the cutter to the printer.

2 – Slide the basic tray arms under the mounting plate hinges and hook onto the hinges. The basic cutter tray rests against the front of the printer.



Attaching the Deluxe Cutter Tray

1 – Attach the cutter to the printer.

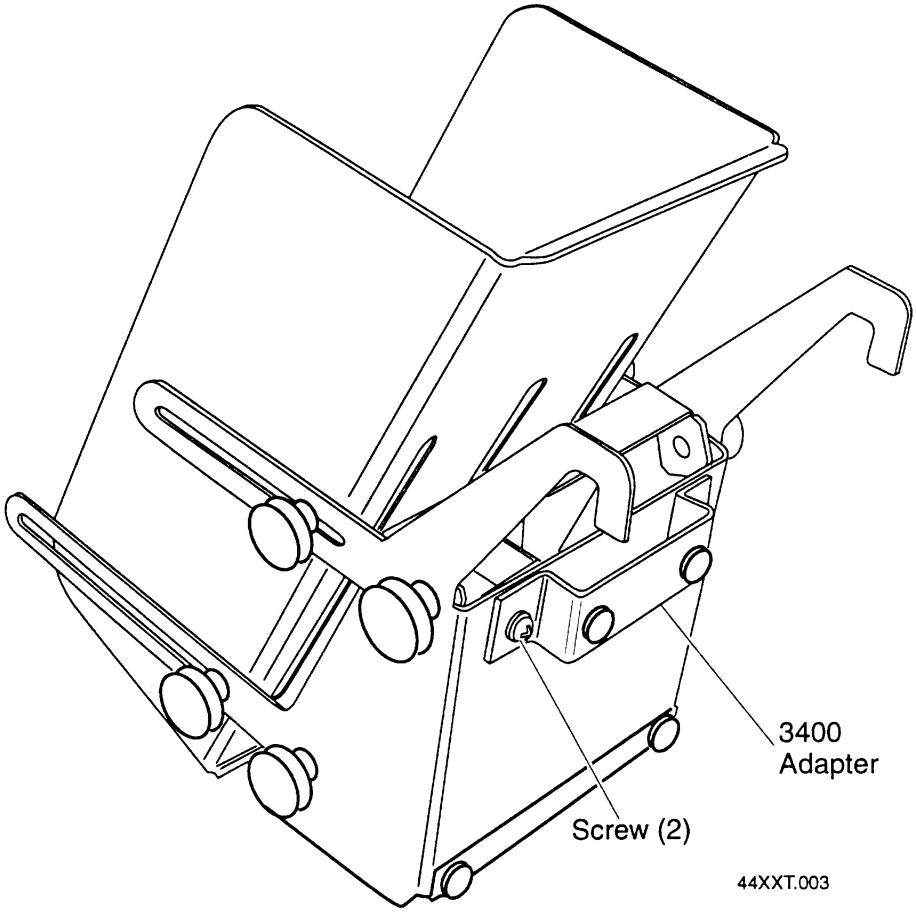
2 – Loosen the thumbscrew for the tray base, slide the base up or down to the desired position and tighten the thumbscrew.

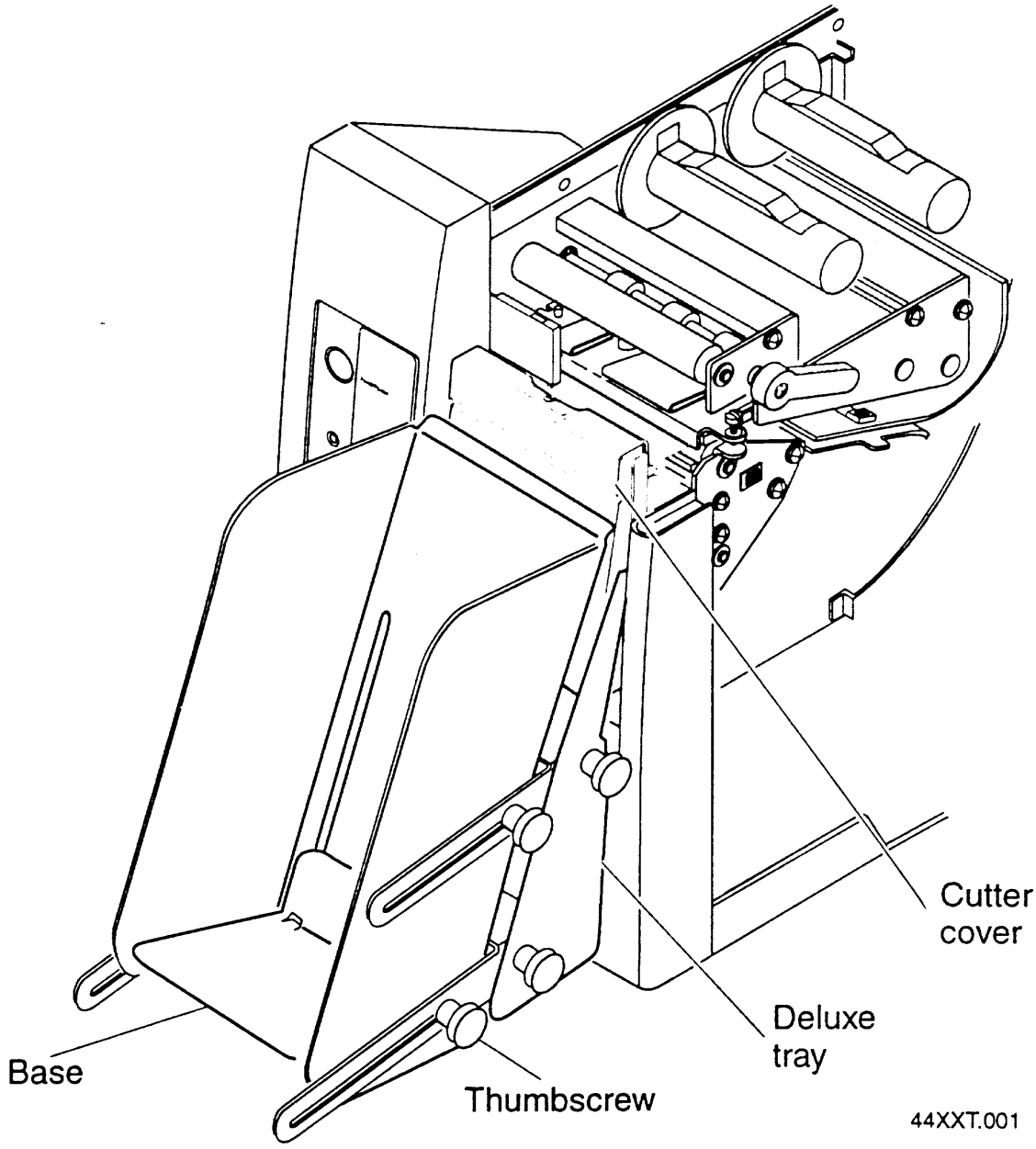
3 – For the 3400, attach the 3400 adapter to the back of the deluxe cutter tray.

Note: Depending on the angle of the deluxe cutter tray, it may hang down below the bottom of the printer. Move the printer in front of the leading edge of the surface it is sitting on.

4 – Loosen the 8 thumbscrews on the sides of the tray.

5 – Hang the tray on the hinges of the mounting plate.





6 – Make sure the top of the cutter tray rests against the cutter cover and adjust the tray to the proper angle.

7 – Tighten the thumbscrews on both sides of the deluxe cutter tray.

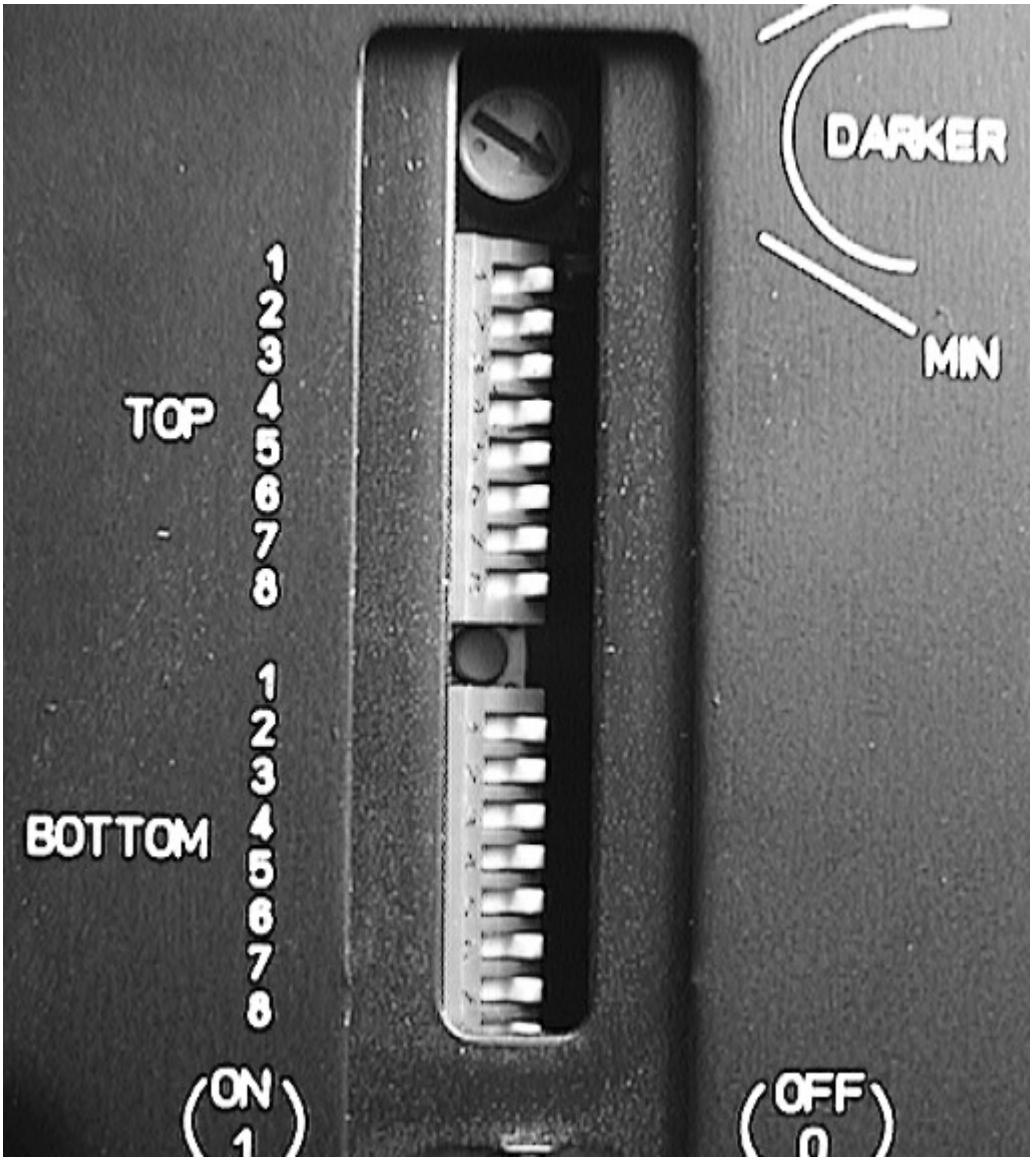
Reset to Factory Defaults

There are three ways to reset the printer to factory defaults.

1 – Use the test and service switch settings to reset a portion or all of the battery backed RAM.

2 – Send the IPL command <STX><ESC>T;D;R<ETX> to reset the printer.

3 – On the 3400C, there is a momentary contact switch in between the two switch banks in the back of the printer. If you hold this switch in for at least a minute, all data will be lost from the battery backed RAM and the printer will return to default values.



3400 Electronic Architectural Description

Introduction

This document describes the operation of the electronics on the 3400 Thermal Printer. This printer was designed as a low end printer to enhance our product line. Any reference to parts in this document uses the reference designators as they appear on the schematic of the assembly, *059050-003 Rev C.*

Power Supply

The power supply for the 3400 is primarily a linear supply with a switching buck converter for the 24V printhead supply. The base mechanism is equipped with an AC input filter and a transformer which supplies the board 12 VAC and 40 VAC.

+5V

The +5V supply is generated from the 12 VAC inputs on connector J10. Diode bridge D12 rectifies the AC voltage and regulator VR1 regulates this DC voltage to +5V. Capacitors C54-C56 are used for filtering and storing of energy for hold time at power down or black out. VR1 is rated at 1.5A and is sufficiently heat sinked to handle this amount of current. The typical +5V load is ~1A.

+40V

The +40V supply is generated from the 40 VAC inputs on connector J10. Diode bridge D13 rectifies the AC voltage capacitors C95 and C58 are used as filters. 40 VAC is unregulated and used for the stepper motor voltage. The +40V supply is also zenered down to 5.1V to supply the motor logic to prevent excessive motor currents on power up. Another zener is used to supply 15V which is used by the +24V buck converter.

+24V

The +24V, print head power supply is a buck converter that runs in hysteresis mode. It takes the unregulated +40V and uses a switching transistor to reduce the output voltage to +24V with)10% regulation.

Print head power supply (PHPS) inputs are 15v, +40V, and BEO. Feed back to the PHPS is 24 volt com and 24 volt sense. The 15V input is used to power the comparator (U27). The 15V supply is derived from the +40V supply using a zener diode (D16). This ensures that the PHPS is controlling the PH voltage whenever +40 volts is available.

+40V is the main power input to the PHPS. It is bucked down to 24 volts through Q5, D21, and L1.

BEO is a logic signal that controls the level of 24VREF (reference) to the comparators (U27). When BEO is low, Q10 is off which allows Q9 to turn off and pull the reference low. This turns the PHPS off.

24 volt com and 24 volt sense is provided by wires that go directly to the print head. This allows the PHPS to detect what the voltage is at the print head. This voltage is divided down to 5 volts by R149 and R150. The comparator then compares the feed back voltage at its plus input to the reference voltage at its negative input. If the feedback voltage is low, U27 pin 1 goes low which in turn causes U27 pin 7 to go low. This turns off Q6, which turns on Q7 and Q5. When Q5 is on the +40V supplies current to the print head supply through D21 and L1. When the print head voltage is high (> 24 volts), Q5 is turned off and the print head power supply is charged by the recycling current of L1. The current path now is from ground through D19 and L1 to the print head supply. This continues until the energy that was stored in L1, while Q5 was on, is used up and the feedback voltage falls below 24VREF again.

A couple of other interesting areas of this buck converter are:

R140, R148
These resistors set up the voltage divider that provides the hysteresis to the comparator Input. This hysteresis, along with the load, controls the switching frequency. (aprox 50 to 100 Khz)

C96, R186
These components cause short term hysteresis in addition to the regular hysteresis. This helps the comparator ignore switching noise.

C63, D20, R135, Q6, D18
When Q6 is on the anode of D20 is referenced to ground through D29, R147 and, D23. At this time C63 is being charged through R135. The voltage across C63 is controlled to 15 volts by zener diode D20. When Q6 is turned off the voltage across C63 turns on Q7 which places 15 volts of C63 across the gate source of Q5. When Q5 is on the Q5 source voltage is raised to +40v. Because C63 is referenced to the source of Q5, the gate source voltage of 15 volts is maintained. (when the source voltage = +40v, the gate voltage = 55V) During the time that Q5 is on D18 is back biased and C63 is not being charged. When Q6 turns on again Q7 is turned off and the gate of Q5 is discharged (Q5 is turned off) through R147 and D23.

D21
When Q5 is off and L1 is in its recirculating mode D21 is not needed. But when the current in L1 is zero, both ends of L1 will seek the print head voltage. 24 volts. D21 allows the source of Q5 to be at ground while Q6 is on. This allows C63 to charge normally and the reverse gate source voltage spec of Q5 not to be broken.

Power Fail Detection

The power fail detection circuitry consists of IC U31, diodes D7, D8, D9, and D11 and some resistors and capacitors. Diodes D4 and D5 rectify the incoming 12 VAC and R101 and R107 act as a divider. D9 is a zener diode to prevent the input on U31 from exceeding +5V. D11 is a 1.235V reference. When the voltage at pin 3 of U23 exceeds 1.235V, the output is pulled up by a 10K resistor, R183. R104 adds some hysterisis to help filter out noise or brown outs. C44 and C49 are also for filtering. C46 and R107 set up a time constant of 1.5 60 Hz cycles to filter out brown outs. The hold time of the +5V will vary with line voltage and the state of the printer, but will exceed 20 ms at low line and not printing.

Battery

The battery is used to backup the static RAM for font, format, and UDC storage. R34 limits the reverse current into the battery, a safety requirement for lithium batteries. The battery itself is a 3.6V lithium battery with 1.75 Ah. Diode D4 is a low leakage schottky diode to isolate the battery voltage from VCC of the circuit card when power is off, but has minimal voltage drop to RAMVCC when power is on. Transistor Q2 and IC U5 will cause the RAM chip select to be held in a high (inactive) state when /RESET is low to prevent inadvertent writes to RAM during power up or power down.

Battery Life Calculations:

Battery capacity = 1.75 Ah
RAM Data Retention current = 20 uA max., 1 uA typical

With printer off all the time and worse case:
Battery Life = 1.75 Ah / 20 uA = 87,500 hours = 10 years

With printer off all the time and typical case:
Battery Life = 1.75 Ah / 1 uA = 1,750,000 hours = 200 years

Reset

RESET is generated by U29 which is a Motorola MC34064 Under voltage Sensing circuit. The output of U29 will be low for any supply voltage less than 4.6V.

Motor Driver

The motor driver circuit for the 3400 consists of IC U24 and U22 with many resistors, capacitors and a transistor. U24 is an Allegro Microsystems UDN2998W Dual Full-Bridge motor driver. The UDN2998W has four control inputs, two for each winding, one phase and one inhibit. The phase inputs are controlled directly by the processor as M2 and M3. Comparator U22 is used to determine the motor winding current and pulse width modulate the inhibit inputs to maintain a constant current to the motor. Processor signals M1 and M4 are used to enable each winding of the motor. If M1 or M4 is LOW, the winding will be off, if HIGH, the winding will be enabled. With this amount of control either full or half stepping can be accomplished. M5 is provided to offer a high current and low current setting for the motor. When M5 is low, the motor driver circuit is in high current mode. We have used this input to vary the reference voltage to comparator, U22, by chopping the control signal thus switching between high current and low current modes at a fairly high rate. The divider resistors, R108 and R113, and capacitor C50, effectively filter the switching and maintain a constant, lower, voltage reference at the positive inputs of the comparator. Processor control signals M1 and M4 are buffered by IC U5 so that on power up initialization the motor windings are off.

Processor

The processor used in the 3400 is a Motorola MC68332 32-bit integrated micro controller. Based on the MC68020, the MC68332 contains four peripheral modules: CPU32, a 32-bit central processing unit; TPU, a complex, programmable time processor unit; QSM, a queued serial module; and SIM, system integration module. The MC68332 was chosen for it's 32-bit processing power along with it's high level of integration.

Chip Selects

The SIM of the MC68332 allows up to 12 chip selects to be programmed by the software for use in the system. We use 8 of these chip selects. /CSBOOT is used to access the EPROM of the system. It will handle up to 1 Meg of EPROM organized as 512K X 16. The current implementation contains 256K X 16. /CS0 is used for accessing DRAM which is configured as 256K X 8. /CS1 is reserved for possible expansion to 512K of DRAM configured as 256K X 16 for higher performance. /CS2 is used to access the static RAM which is used for font, format and UDC storage. /CS3 is used to access the ASIC. /CS4 is used for accessing the I/O option port. /CS5 is a write only chip select for loading the FIFO with image data. /CS8 is a read only chip select for reading the DIP switches. /CS6 is used as A19. /CS7, /CS8 and /CS9 are reserved to be used as A20, A21 and A22 for possible memory expansion.

TPU

The TPU is the Time Processor Unit of the MC68332. It has 16 programmable channels which can be used to generate output waveforms or capture input signals. Fourteen of the sixteen channels are used in the 3400 printer design. The TPU has built-in functions which can be used, or the developer can override these functions by downloading new functions into the MC68332 Standby RAM. The 3400 design uses custom TPU functions to perform the following tasks:

Channel 0 is an input used to capture the /STPINT signal. When /STPINT goes active, channel 0 will interrupt the CPU to indicate a step, link to channels 1-6 and 10 and set up a match for the half-step time. Channels 1-4 are outputs which control motor signals M1-M4 respectively. After initialization to set up motor direction, each channel will output the next bit of a programmable bit pattern whenever a link is received from channel 0. A fixed delay is set for each channel so that all four channels will switch simultaneously. Channel 5 is an output for generating the duration portion of the strobe waveform. A pulse of programmable delay and width is generated after a link from channel 0. Channel 6 is an output for generating the chopped portion of the strobe waveform. A continuous square wave of programmable frequency and duty cycle is generated and synchronized with each link from channel 0. Channels 7 and 8 are outputs used to control the front panel LED's. They can be set high, low or square wave output with programmable frequency. Channel 9 is reserved. It has RXD as an input to try auto-detection of serial communications parameters. Channel 10 is an input for the ribbon sensor. The channel detects transitions on the input and if it does not receive one before it receives a programmable number of links from channel 0, it will interrupt the CPU to indicate a ribbon failure. Channel 11 is an output to generate the refresh requests for the DRAM. It will generate a low pulse at a programmable frequency and duration. Channel 12 is an input for the front panel switch. It detects transitions on the input, debounces the switch and interrupts the CPU. Channel 13 is an output which generates a square wave of programmable frequency. It is used to set the current level for the motor driver circuit.

QSM

The QSM consists of two modules, a Serial Peripheral Interface (SPI), and a Serial Communications Interface (SCI). The SPI is used to communicate with the A/D converter. It takes continuous readings and stores the values in RAM for immediate access by the CPU. The SCI is used for RS-232/RS-485 communications. Other pins are used as general-purpose I/O.

Interrupt Priority Levels

The SIM module has 7 IRQ pins to help facilitate external interrupts in the 3400. /I/ORCV, /I/OXMT, /PFAIL and HF are available as interrupts. /I/ORCV and /I/OXMT are used for communications with the I/O option interface. HF is used to indicate the FIFO needs service, and /PFAIL indicates a loss of power. The other IRQ pins are used for general-purpose I/O.

Crystal

The clock synthesizer of the MC68332 can operate from an on-chip phase-locked-loop using an external crystal. A 32.768-kHz crystal provides an inexpensive reference which allows the processor to run at frequencies from 131 kHz to 16.777 MHz. The clock synthesizer is programmed to run at 16 MHz in the 3400.

Memory

The MC68332 has separate address and data busses making the memory interface very straight forward. All I/O is memory mapped and the SIM chip selects are used to select program space, data space, and I/O.

Static RAM

The 3400 comes with 32K of battery backed Static RAM. The RAM is configured as 32K x 8. The chip select for accessing SRAM should be configured to at least one wait state. The RAM can also be upgraded to 128K x 8 by swapping the component at location U6. For future expansion, the socket for the RAM has been laid out to accept a 4 Mbit part. In order to implement this feature the trace on jumper J3 between pins 1 and 2 must be cut and pins 2 and 3 shorted.

RAM access time:

Processor access time >= Ram access time
3 * CLK >= Tcslow + Tramaccess + Tsetup + Thc32
3 * 1/16 MHZ >= 30 nS + 120 nS + 5 nS + 18 nS
187.5 nS >= 173 nS

EPROM

The EPROM for the 3400 is 2 256K x 8 EPROM's configured as 256K x 16. The sockets at IC locations U8 and U9 were designed to accept up to 4 Mbit EPROM's without any jumpers which would give a total of 1 M of EPROM space. The EPROM's have an access time of 150 ns which requires no wait states.

EPROM access time:

Processor access time >= EPROM access time
2 * CLK >= Tcslow + Tepromaccess + Tsetup
2 * 1/16 MHZ >= 30 nS + 70 nS + 5 nS
125 nS >= 105 nS

DRAM

The 3400 main memory consists of 256K of dynamic RAM. The DRAM is configured as 256K X 8, IC's U17 and U19. DRAM was used on the 3400 in order to save cost. To support the DRAM interface, GAL U13 is used to handle refresh and control lines between the DRAM and the processor. For the current memory configuration, only /DRAMLCS and /CASL are used. /DRAMHCS and /CASH are reserved for a 16-bit DRAM interface which would provide more memory and higher performance. IC location U26 and jumper J16 are already laid out for such expansion. Jumper J16 is laid out for the current configuration. If the expansion were implemented, the trace between J16 pins 2 and 3 would be cut and pins 1 and 2 jumped. U26 would be stuffed, while U17 and U19 would be removed. GAL U13 would need to be upgraded for the wider RAM. See Appendix A for GAL listings of both the current configuration and the 16-bit wide implementation. Multiplexors U16, U18 and U20 are used to generate the row and column addresses for the DRAM.

Communications Interface

The communications interface for the 3400 follows the Intermec Standard Data Connector standard. J1 is a 25 pin D-sub connector which supports both RS-232 and RS-485 interfaces. U1 is the RS-485 driver/receiver and U2 and U4 are the RS-232 driver and receivers. To further enhance the interface to support DTR/RTS flow control, the DTR pin is driven with the PIN11 signal. This is a slight deviation from previous implementations, but makes it possible to use standard cables for hardware flow control, such as the DOS "COPY" command from any PC. This is consistent with all newer Intermec printers including the 4100 and the 4400B.

A/D Converter

The Motorola MC145041 A/D converter is an 11 channel, 8-bit, serial A/D. The reference is set to +5V. Seven of the 11 channels are used:

Channel	Function
0	Label Gap sensor
1	Darkness adjust
2	Printhead thermistor
3	Label Mark sensor
4	+40V
5	Printhead voltage, +24V
6	Label Taken sensor

The A/D is continuously communicating with the MC68332 through the SPI, getting conversion commands and channel addresses while sending back results from the previous command. The clock rate for the MC145041 is 1 MHz.

DIP Switches

The 3400 has 16 DIP switches to provide configuration and test and service operation. See the User's Manual for switch definitions.

ASIC and I/O option Interface

The 3400 uses the Intermec Thermal Compensation ASIC originally designed for the 4400. This ASIC handles the loading of the printhead to implement our dot-by-dot thermal management scheme. See the ASIC documentation for more information.

Address/Data Multiplexor

Since both the ASIC and I/O option interfaces were designed to interface with a processor with multiplexed address and data, it was necessary to multiplex the address and data from the MC68332. IC's U14 and U15 are used to route address or data to the AD[0:7] bus.

Chip Select Generation

GAL's U23 and U25 are designed to take the MC68332 bus control signals and convert them into ASIC and I/O option control signals. A state machine governs the timing of the signals and also dictates that the /ASICCS and /OPTIONCS from the processor be programmed for two wait states.

I/O Option Connector

The I/O Option connector J8 is a 40 position pin field. Two chip selects, /OPTION and /BOKI/O are used to select either the board identification number or the data port, respectively. XMT and RCV are outputs from the I/O option cards which are inverted and go to the processor to generate communications interrupts.

FIFO

The FIFO, U11, is the same FIFO used in the 4400 printer. The IDT 72105 is a 256 x 16 FIFO with parallel inputs and serial output. The processor loads image data into the FIFO with word writes. At the beginning of a line, the MC68332 loads 3 lines of data into the FIFO. This causes the HF flag to go HIGH. The ASIC will then begin clocking data out of the FIFO. Each line, the processor will check the HF flag and if the FIFO is less than half full and there is still more image to load, the processor will load the next line of data. If the image has been completely loaded, the FIFO will become empty and the /EF flag will go LOW. This tells the ASIC to stop clocking data from the FIFO.

Front Panel Interface

Connector J15 connects to the front panel board. Inputs consist of one button; FEED/PAUSE and two LED's; ALERT and PAUSE/EMPTY. The ALERT LED indicates system errors or printhead over-temperature, while the PAUSE/EMPTY LED indicates a paused state or a media fault.

Debug Interface

J5 provides a debug interface to the processor which allows for troubleshooting of the main PCB. This interface can be used to put the processor into background mode and then send commands to read or write memory or register locations. This interface is used for in-house functional test and was used for engineering development.

GAL U13

This GAL is the DRAM control GAL which generates /RAS and /CAS, supplies /DSACK acknowledge to the processor and handles refresh. In addition, RXD and STROBE are created from their respective input signals in order to save discrete logic.

```
Title, 'State machine for DRAM control';
clock,clkin,oepin 1,9,11;
lcs,hcs,ref          pin 2,3,4;
rcv232,rcv485        pin 5,6;
stbdur,stbchp        pin 7,8;
ras,casl,cash pin 19,18,17 istype 'reg,invert';
dsack1,dsack0        pin 15,14 istype 'reg,invert';
addsel,rxd,strobe    pin 16,13,12 istype 'com';
```

GAL U23

This GAL generates the chip selects for the I/O option and ASIC interfaces. This is a state machine design with 5 active states. S0 is the initialization and idle state. When either chip select input, ASICCS or OPTIONCS, goes active, low, the state machine will advance to S1 on the next clock edge and the outputs will change according to the equations in S0. Since all of the outputs are registers, they will change only with the clock. The state machine will then advance to S2, S3 and S4 on each successive clock edge and finally back to S0. The appropriate chip select output which went low on the transition from S0 to S1 will remain low until S4. If a reset ever occurs the state machine will re-initialize to S0 in the next clock edge.

```
Title, 'State machine for ASIC interface';

clock,reset,oe       pin 1,9,11;
asiccs,a16,a17       pin 2,3,4;
r_w,optioncs pin 5,6;
bokio,option,tcs     pin 19,18,17 istype 'reg,invert';
slcs,phcs            pin 16,15 istype 'reg,invert';
s0,s1,s2             pin 14,13,12 istype 'reg,invert';
```

GAL U25

This GAL takes the state outputs, S0-S2, of GAL U23 to generate the other control lines required for the I/O option and ASIC interfaces; RD, WR, DEN, AEN, and ALE. It also takes the NEWLINE signal from the ASIC and guarantees a minimum two clock pulse width to the processor for the STPINT signal. The outputs will change according to the equations on each clock edge. The equations for state S0 actually represent the state of the outputs for S1, S1 for S2 and so on. STPINT will go low on the first clock after NEWLINE goes low and stay low for 2 clocks after NEWLINE goes high.

```
Title, 'State machine for ASIC interface';

clock,reset,oe       pin 1,9,11;
s2,s1,s0,r_w         pin 2,3,4,5;
rd,wr,den,aen,ale    pin 19,18,17,16,15 istype 'reg,invert';
newline              pin 6;
stpint               pin 14 istype 'reg,invert';
stp1,stp2            pin 13,12 istype 'reg,invert';
asiccs, optioncs     pin 7,8;
```

Electrical Adjustments

Label gap sensor POT adjustment: R124 or R6

1 - Connect the positive lead of a multi-meter to TP15 and the negative lead to TP 14.

2 - With label backing only in the sensor, adjust R124 (3400A) **or R6** (3400B & 3600) **to 1 volt ±0.2 volts.**

3 - With label and backing in the sensor, verify that the voltage at TP15 is greater than 3 volts.

Label mark sensor POT adjustment: R191

Note: **This adjustment requires the use of Mark label stock (see sample below). Mark sensor does not have to be enabled to calibrate the sensor.**

1 - Connect a DVM to the following test points:

- ⇒ **Ground lead to TP14**
- ⇒ **Positive lead to TP18**

2 - With the WHITE portion of the mark label stock at the sensor, adjust R191 to greater than 1 volt (-0.1 volt), and less than 3.5 volts.

3 - With the BLACK portion of the mark label stock at the sensor the voltage must be 0.5 volts greater than the voltage in step 2.

To configure the printer for Mark label stock, send the online command <STX><SI>T2<BS><ETX> or send the configuration from Label Debut.

Mark Label Stock

Electrical Adjustments (Cont.)

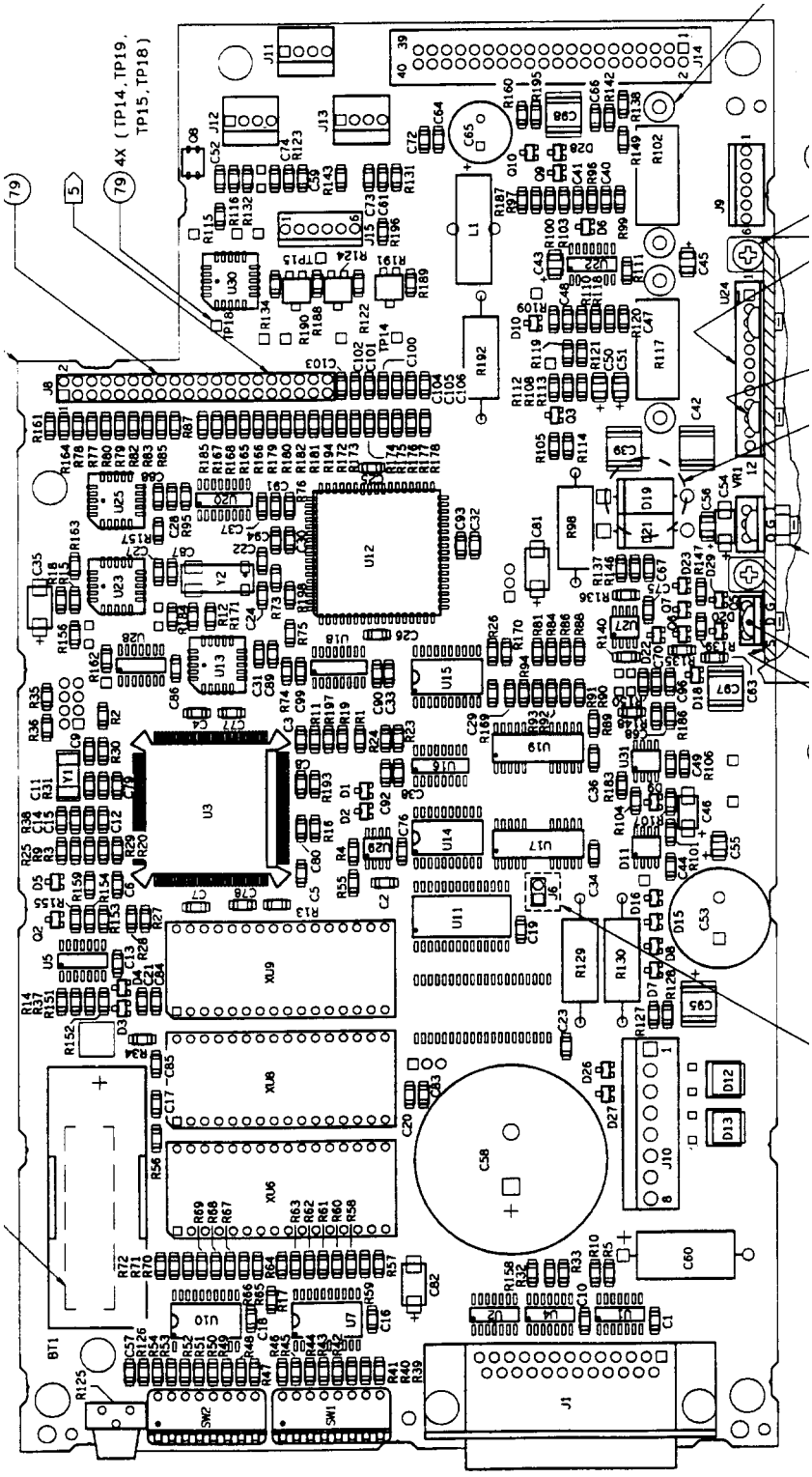
Label Taken sensor POT adjustment: R190

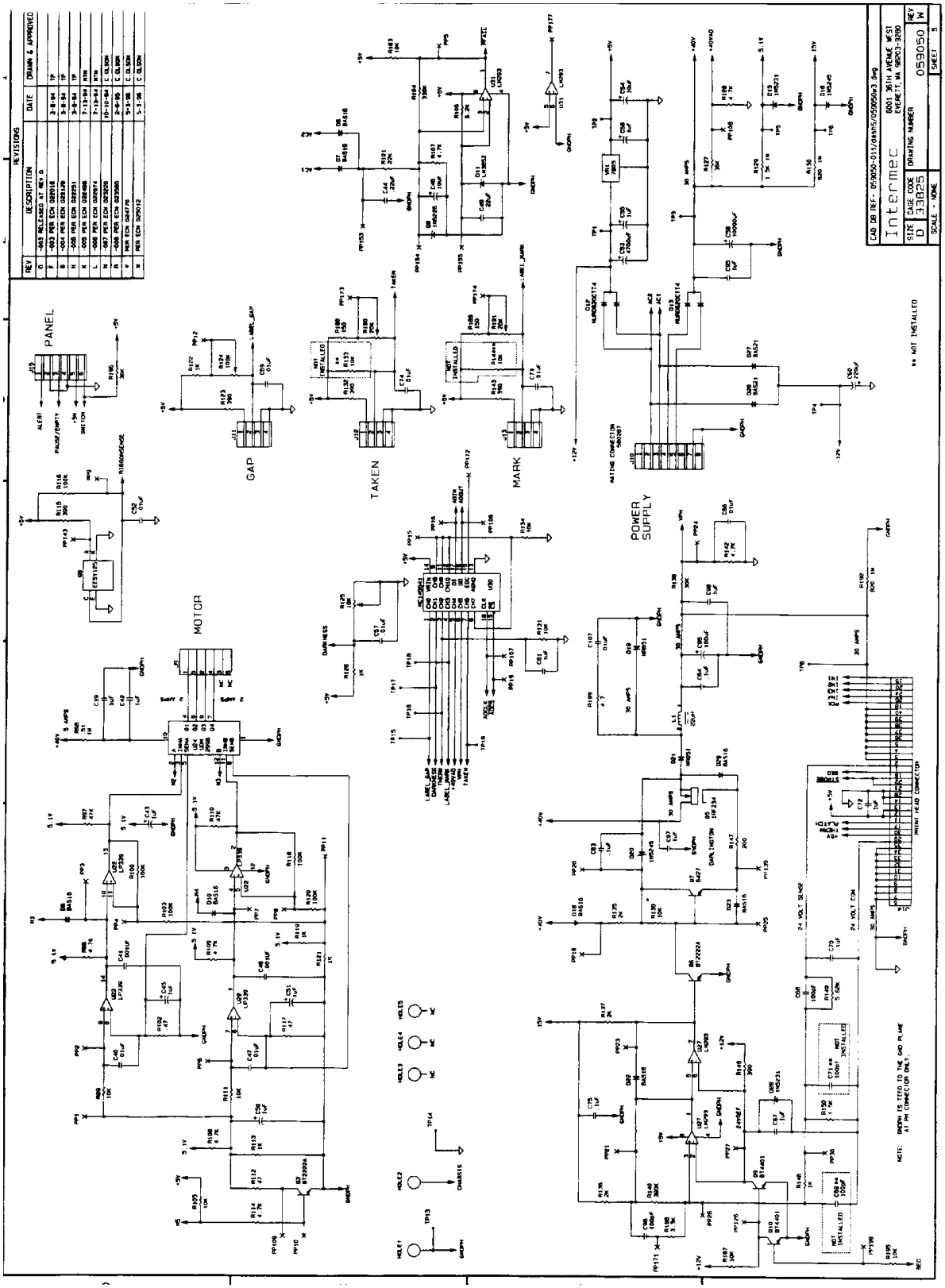
1 - Connect a VoltMeter to the following test points:

- ⇒ **Ground lead to TP14**
- ⇒ **Positive lead to TP19**

2 - Feed out a label so it is positioned under the label taken sensor.

3 - Adjust R190 to 1.2 volts ±0.2 volts with a label under the sensor and greater than 4.5 volts with the label removed from the sensor.

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TAKEN
MARK
MOTOR
POWER SUPPLY
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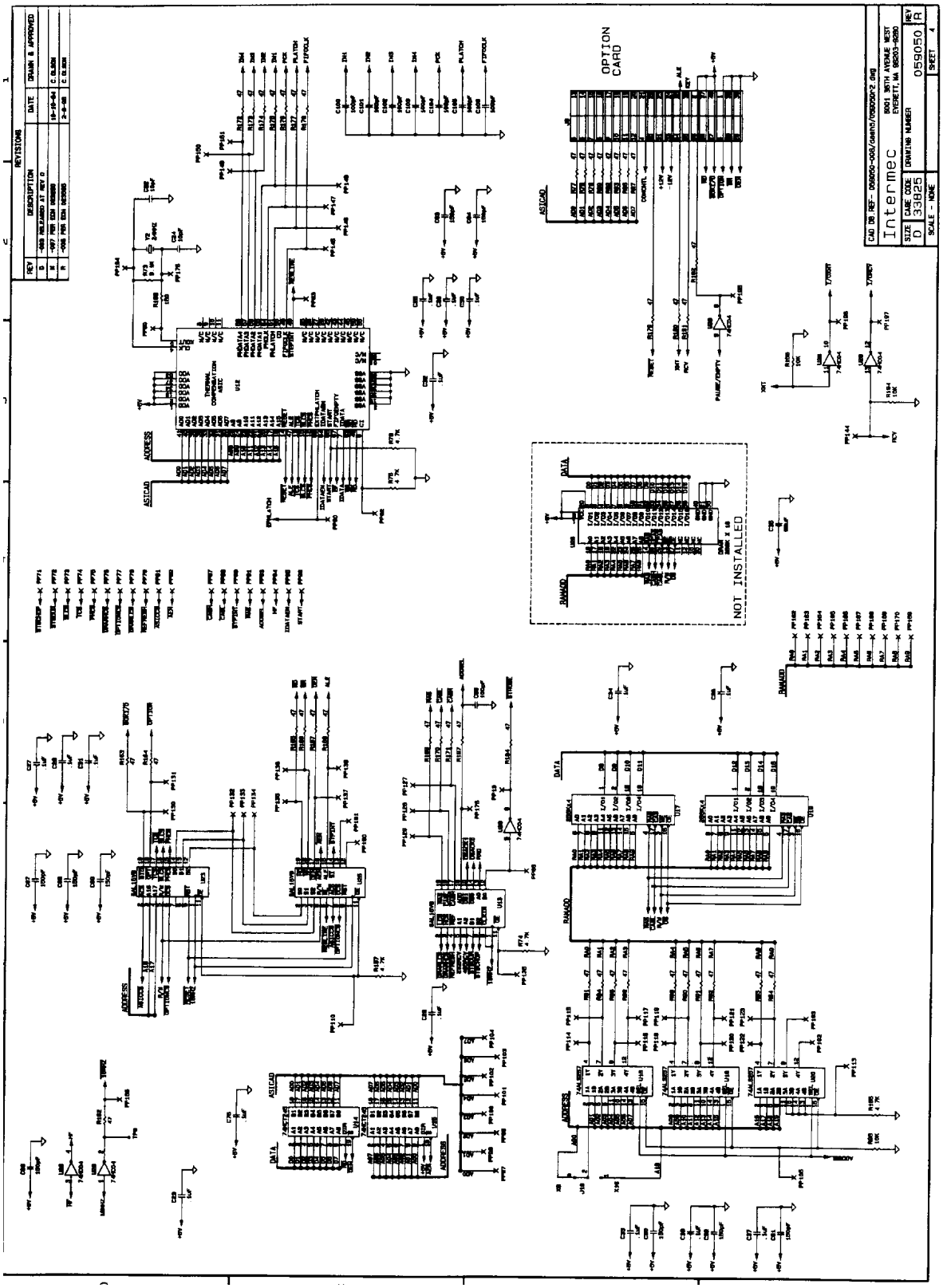
EVERETT, WA 98203-2099
059050
SHEET 5
SCALE - NONE
NOT INSTALLED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CAGE CODE 33925
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DATE
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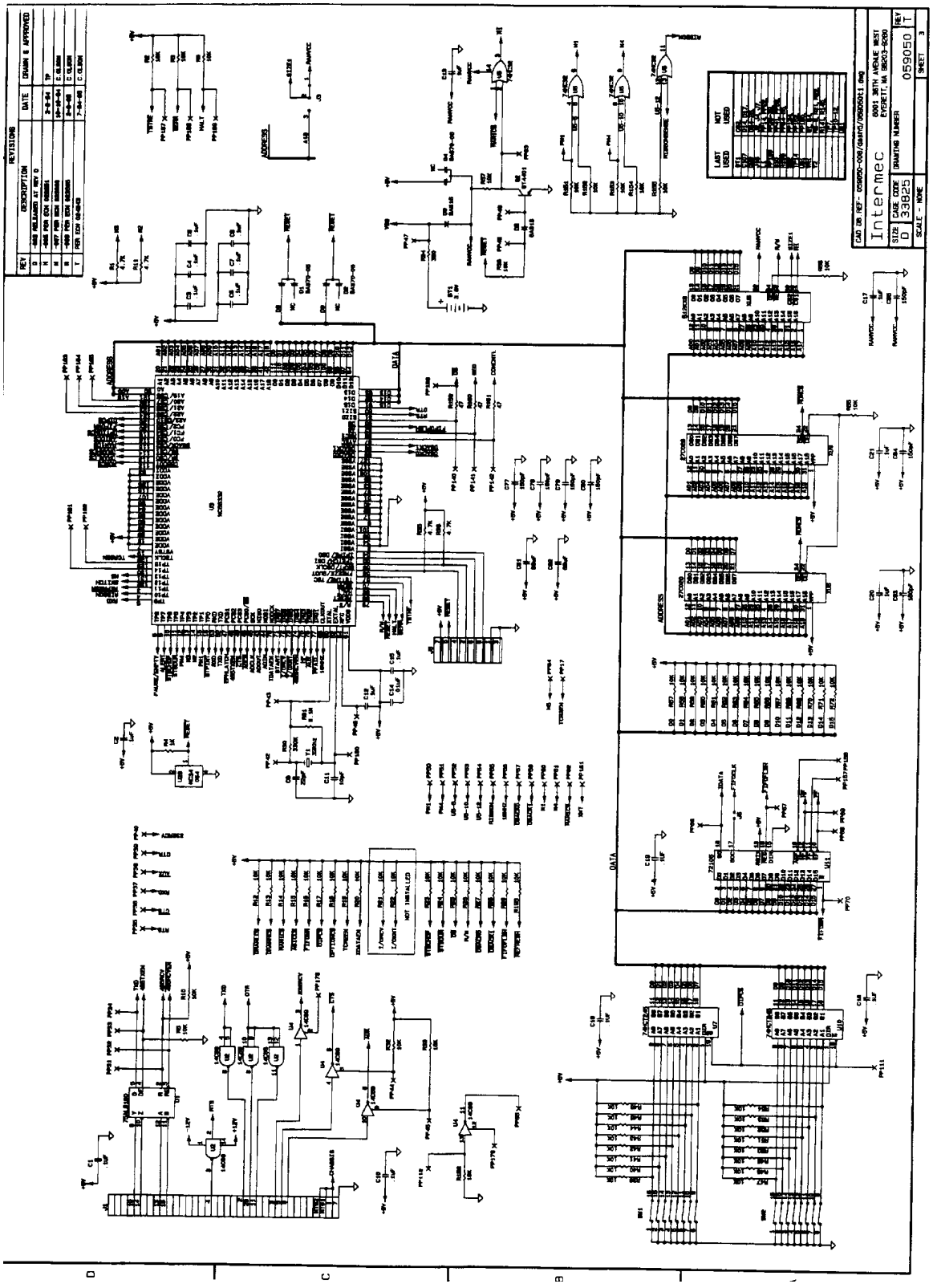
RELEASED AT REV D
C. OLSEN
ADDRESS
DATA
ASIC/CAD
RAM/ROM



3400A Test Points

for Main Board 059050-003

TP 1	**+12volts, I/O circuitry, P/H PSupply**
TP 2	**+5 volts, Logic voltage**
TP 3	**+40 volts, Motor voltage. Supplies +5.1, +15volts**
TP 4	**-12 volts, I/O circuitry**
TP 5	**+5.1 volts, Motor control logic**
TP 6	**+15 volts, P/H PS, +24volt buck converter**
TP 8	**+24 volts, P/H voltage (must be printing to test).**
TP 9	**16 Mhz clock, System clock**
TP 13	**Printhead ground**
TP 14	**Chassis ground**
TP 15	**Label gap sensor**
TP 16	**Printhead thermistor**
TP 17	**Darkness POT**
TP 18	**Black mark sensor**
TP 19	**Label taken sensor**

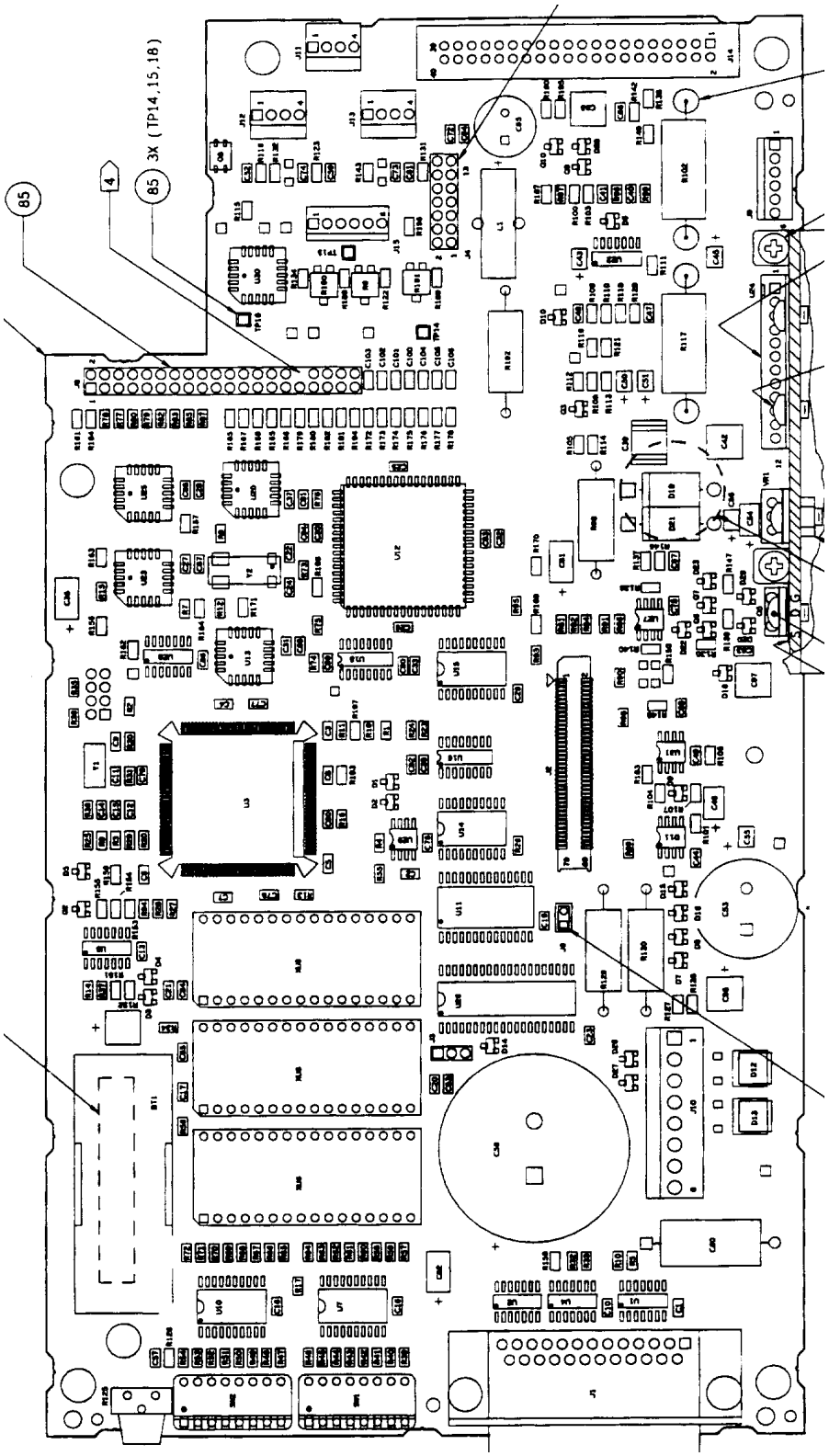
- Power supplies are fixed. 3 printer models based on power supply; 1) 220 volt; 2) 110 volt; 3) 200 volt. The transformers and combination power switch/circuit breaker are different.

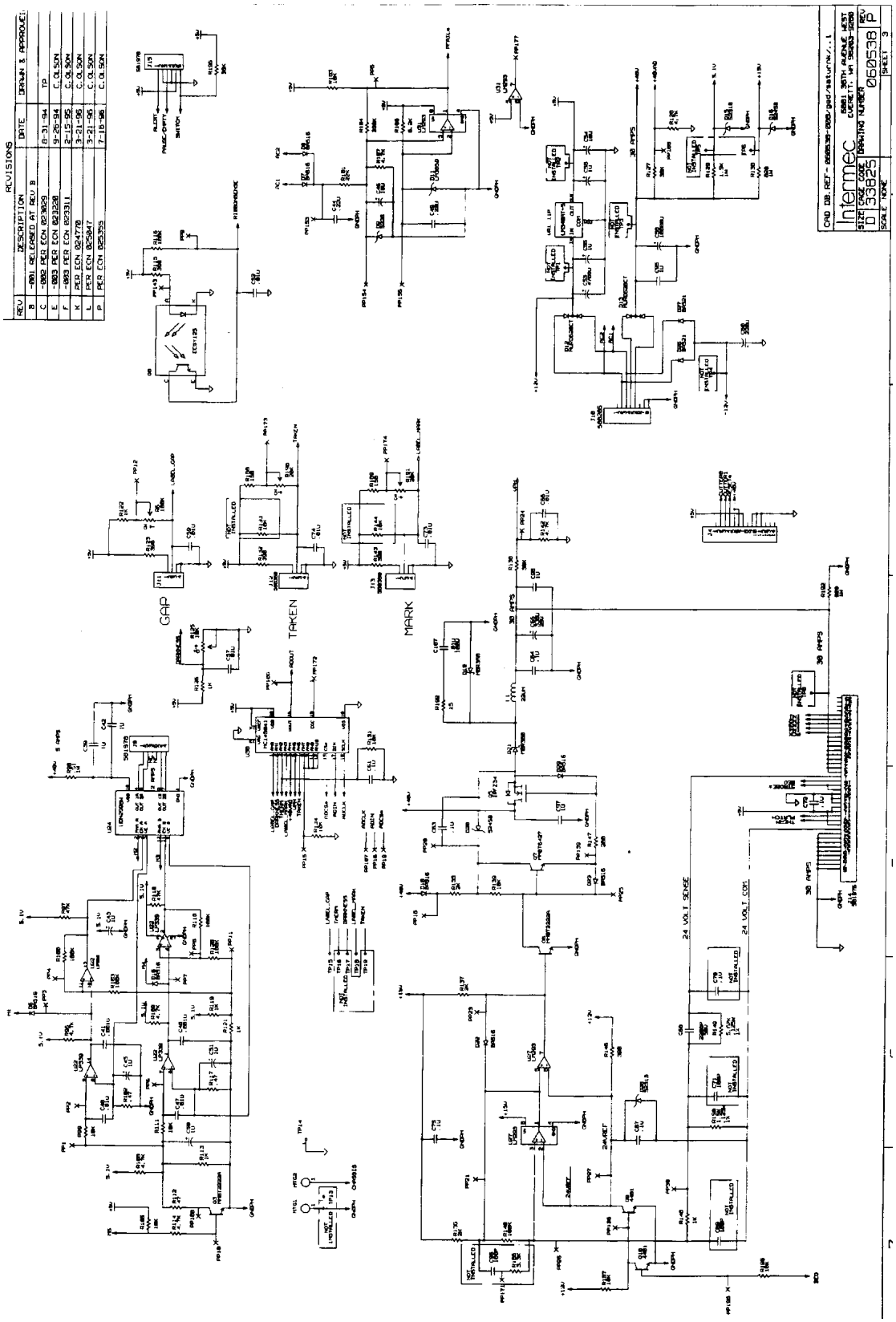
- Main board uses 2, 2 mega bit Proms (256k x 8) for program memory.

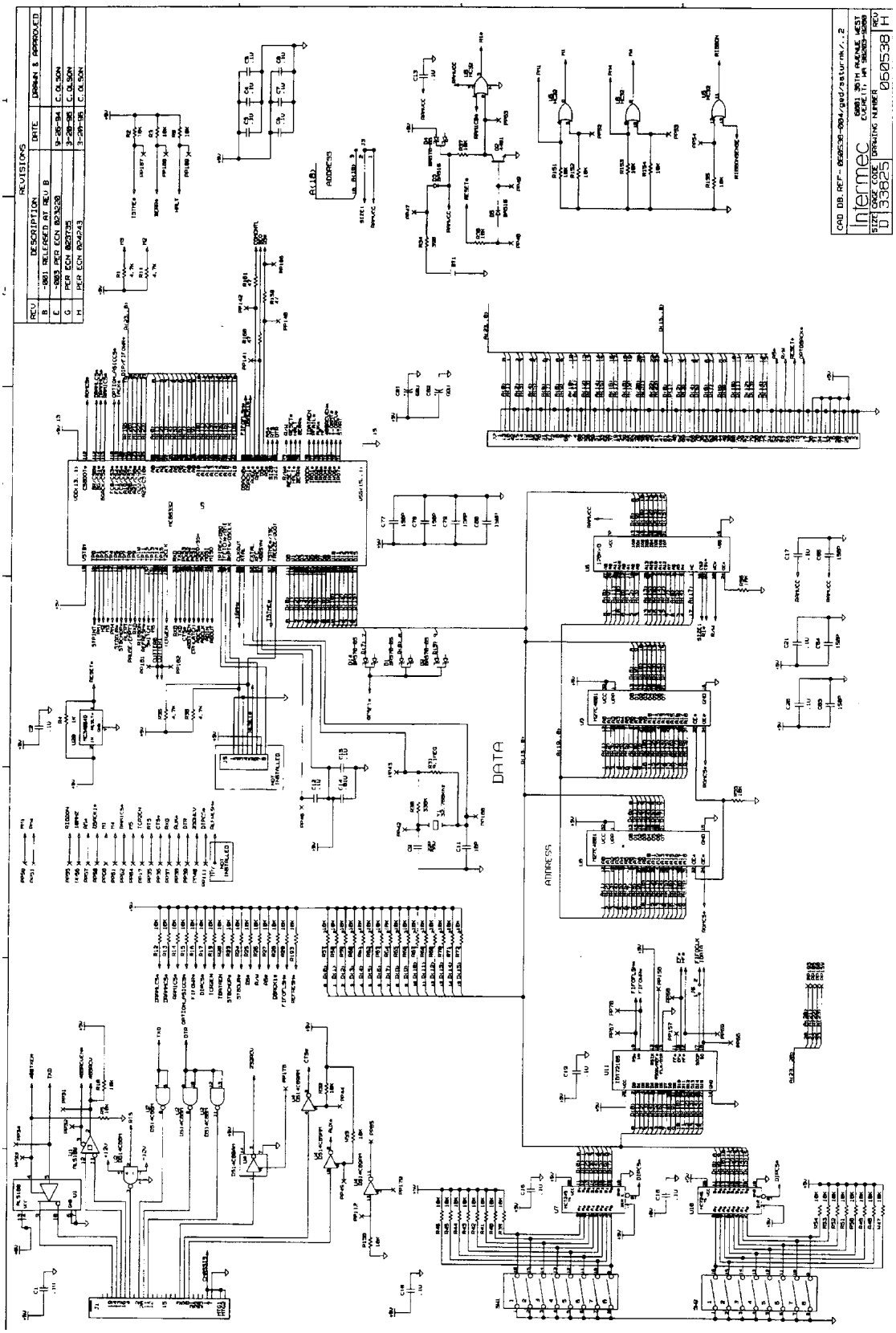
- Printer Uses 256k bytes DRAM for imaging.

- 32k of static RAM is used for storing formats, font and graphics. Option for 128k RAM.

- The only socketed items on the board are the 2 Prom slots and the static RAM slot.


85
4
85 3X (TP14,15,18)


GAP
TAKEN
MARK
24 VOLT SENSE
24 VOLT COM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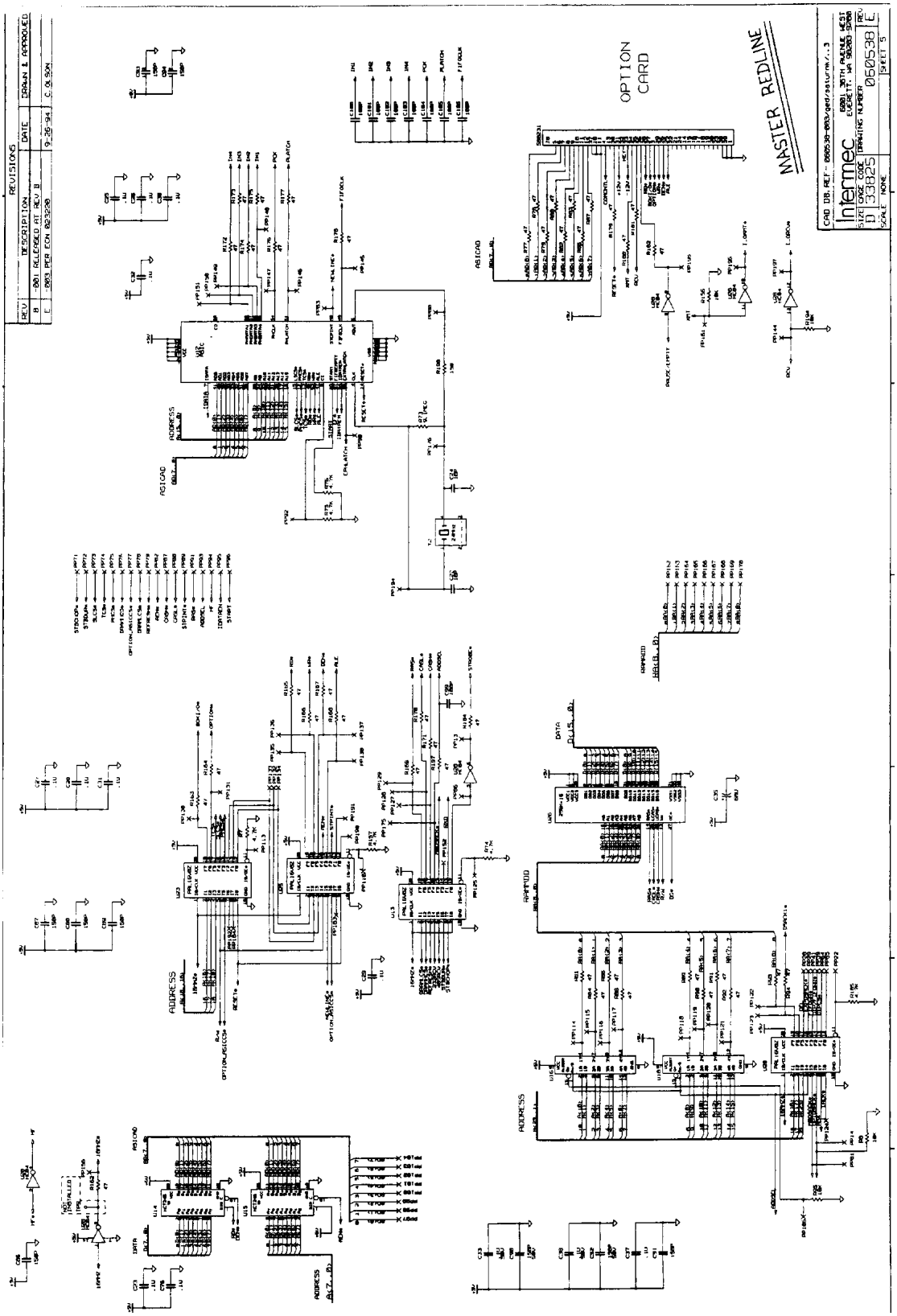
DATE
DRAWN & APPROVED
Intermec
DATA
ADDRESS


OPTION CARD
MASTER REDLINE
ADDRESS
DATA

3400B Test Points

for Main Board 060538-003

TP 1 **+12volts, I/O circuitry, P/H PSupply**
TP 2 **+5 volts, Logic voltage**
TP 3 **+40 volts, Motor voltage. Supplies +5.1, +15volts**
TP 4 **-12 volts, I/O circuitry**
TP 5 **+5.1 volts, Motor control logic**
TP 6 **+15 volts, P/H PS, +24volt buck converter**
TP 7 **REFRESH signal**
TP 8 **+24 volts, P/H voltage (must be printing to test).**
TP 9 **16 Mhz clock, System clock**
TP 13 **Printhead ground**
TP 14 **Chassis ground**
TP 15 **Label gap sensor**
TP 16 **Printhead thermistor**
TP 17 **Darkness POT**
TP 18 **Black mark sensor**
TP 19 **Label taken sensor**

- Power supplies are fixed. 3 printer models based on power supply; 1) 220 volt; 2) 110 volt; 3) 200 volt. The transformers and combination power switch/circuit breaker are different.

- Main board uses 2, 4 mega bit Proms (27C4001) for program memory.

- Printer Uses 512k bytes DRAM for imaging.

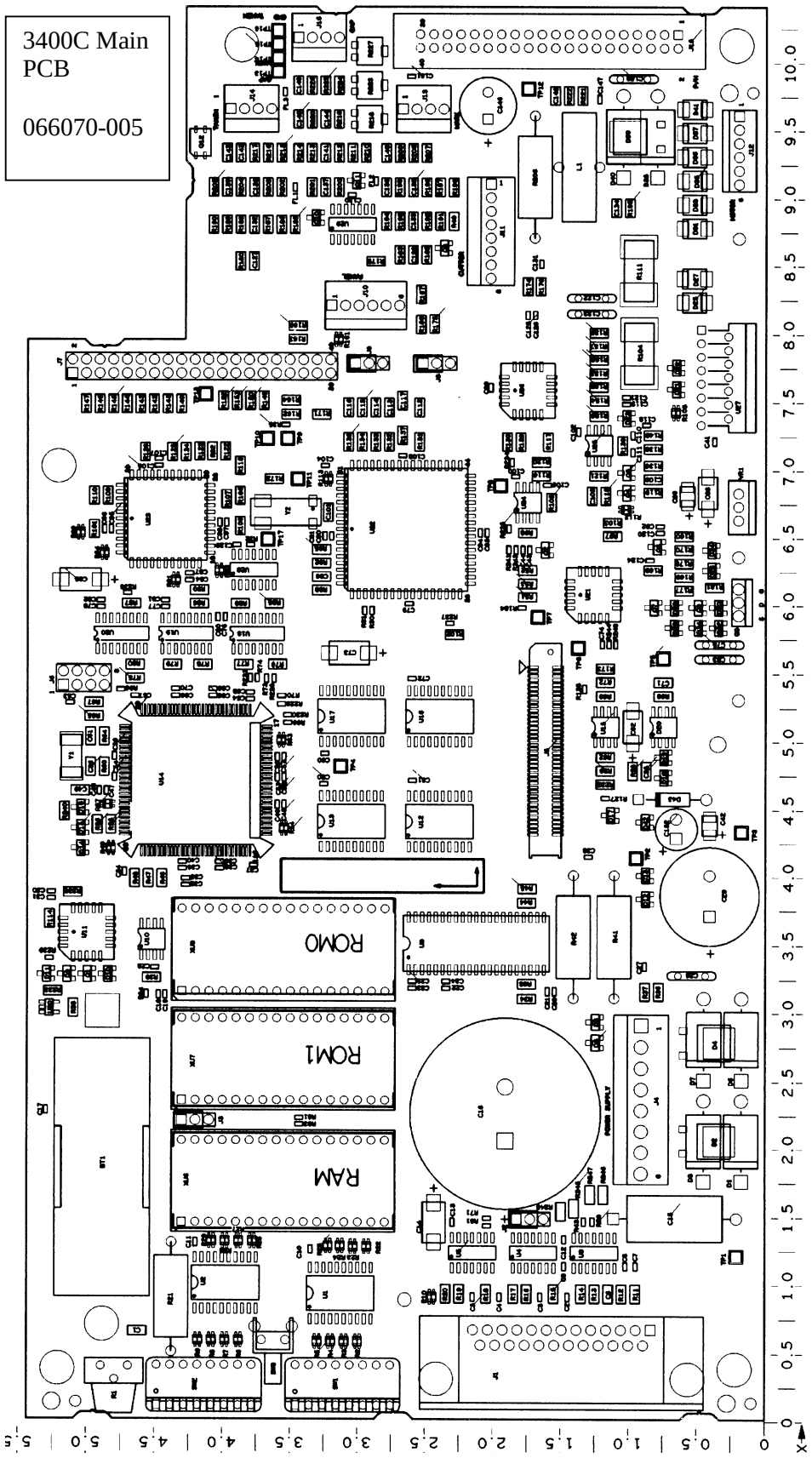
- 128k of static RAM is used for storing formats, font and graphics.

- The only socketed items on the board are 2 EProm slots and the static RAM slot.

- The optional flash memory expansion PCB comes in 2 and 6 Mega bit configurations.

3400C Main PCB

066070-005



3400C Main PCB Features

- No adjustment POTs for the sensors. Sensors are adjusted automatically.
- SRAM reset switch located between the two banks of switches.
- Blinking Power/Data LED when the printer is receiving data.
- Memory options include 512K of SRAM and 2 & 8 Meg FLASH memory plus pre-programmed Japanese Kanji option.
- Serial port is electronically hardened with RC circuitry and 10k pull downs to prevent failure.
- Cutter option. When installing the cutter it may be necessary to remove a plug in one of the connector pins before plugging the connector into the main pcb.
- RS-232 Pin11 and Pin 20 can be disconnected via a jumper.
- Improved power supply circuitry.
- Darkness adjustment POT is now linear. Default is approximatley 9:00 or A/D value of 127.
- Motor Driver IC is new.
- FIFO eliminated and print logic was changed.
- Two piece heatsink assembly.
- Bezel pcb is NOT the same as the 3400A/B.

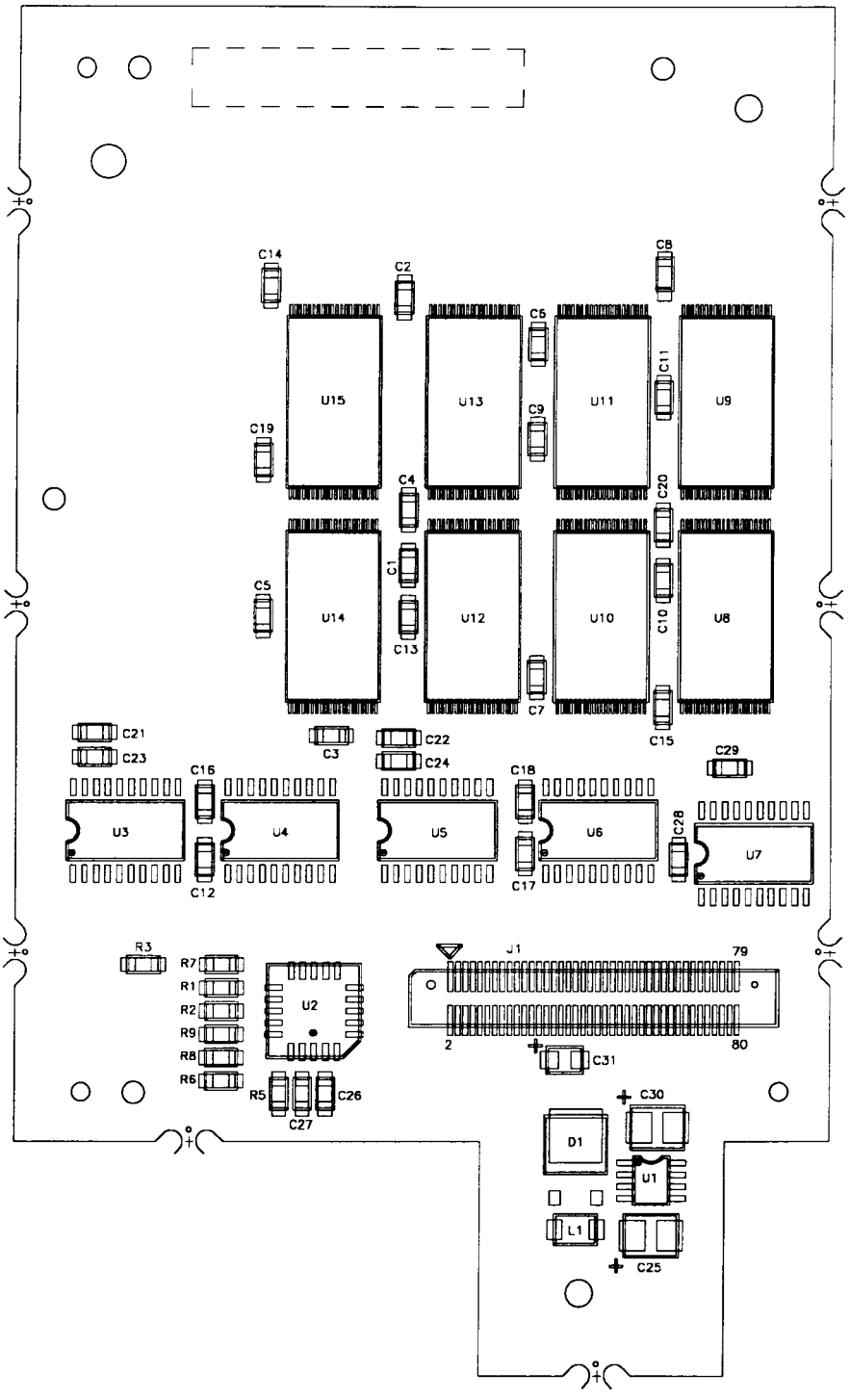
3400C Main PCB Jumpers

J2 – Pin 11, Pin 20 jumper. To disconnect Pin 20 (DTE) from Pin 11, jumper from middle to bottom pins. Pin 20 will then be always HI.

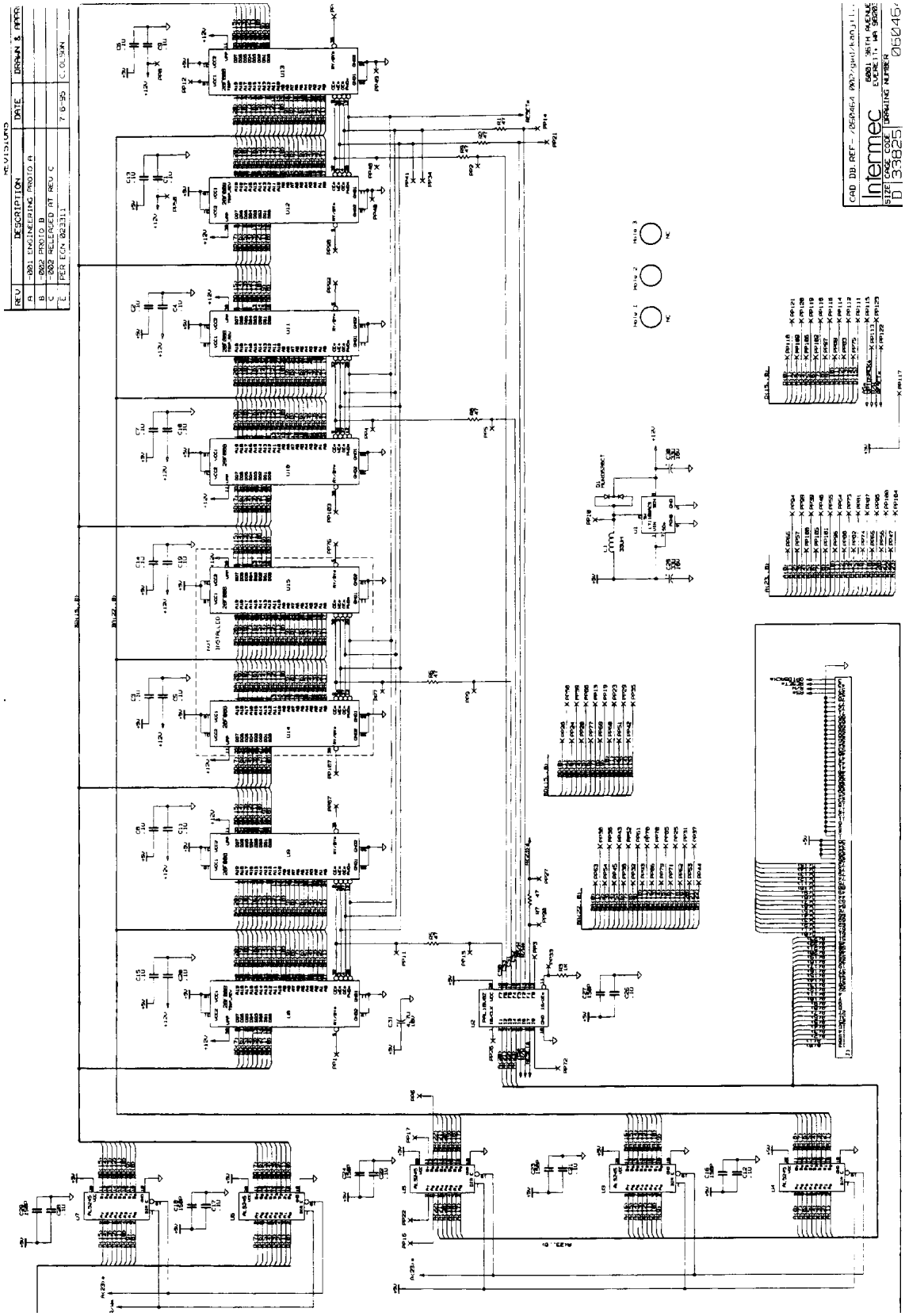
J3 – SRAM jumper. To change from 128k to 512k SRAM, change jumper to middle and bottom pins.

J8 & J9 – Used for future options. Jumpers should always be in top and middle pins.

3400B Memory Expansion PCB - 060464-002



3400B Memory Expansion Schematic



3400 Mechanical Architectural Description

Mechanical Design Features

The following is a list of 3400 mechanical features

- The printer uses sheet metal for the label supply cover, electronics and rear covers. The printer also has a sheet metal main deck.

- Only 1 stepper motor is used. The stepper motor pinion gear drives the platen roller and the liner assist roller (sticky roller) using 96 tooth gears attached to the rollers. The ribbon assist roller is gear driven by the platen roller gear to provide reverse rotation of the roller.

- The platen roller, label/liner and ribbon assist rollers are gear driven using identical 96 tooth gears attached to each roller.

- The liner assist roller (sticky roller) and the ribbon assist roller use one-way clutches to facilitate label retract. The one-way clutches are part of the rollers' drive gear. The liner assist roller will have a black gear and the ribbon assist roller gear will be white. This is to distinguish between the two gears because the clutches are one-way in opposite directions.

- The TTR take-up and label liner take-up hubs are belt driven. They also use a 12 in/oz one-way clutch that manages take-up force and prevents slackening during retract. The TTR take-up belt is driven from the ribbon assist roller. The label liner take-up belt is driven from the sticky roller (liner assist roller). This belt is attached in a crossover arrangement so label liner take-up rotation is reversed. This reversed rotation provides less slippage.

- The TTR supply hub uses a 14 in/oz slip clutch. The hub has a TTR encoder sense label attached to it that is used for ribbon motion sensing.

- The printhead has 832 dots equal to a print width of approximately 4.1 inches. The printhead is center pivoted, with a bias adjustment on the outboard edge of the heat sink. Adjustment can be done using a straight slot screw driver.

- Printhead alignment can be done using a printhead alignment tool. The tool can be used without removing the printhead. There is a printhead adjustment lever on the printhead yoke that provides 3 steps forward movement of the printhead and 3 steps backward from center position in 0.006 inch increments (similar to the 4400B).

3400C

- Added ribbon supply retract spring to maintain tention on the ribbon supply during label retract.
- Ribbon take-up hub clutch helps maintain ribbon tention during retract.

3400 Mechanical Adjustments:

- There are ***3 ways*** to adjust the printhead energy which affects the label darkness. (1) sensitivity number sets the printhead energy management circuitry to match the characteristics of the media being used; (2) online command to set darkness adjust (<SI>d) from -10 to 10; (3) Darkness adjust POT on the back of the printer.
- 3400 has an adjustable printhead lever to position the printhead for the best print quality. Clockwise rotation moves the printhead forward.
- Printhead bias can be adjusted for different widths of label stock by adjusting the screw on the outboard side of the printhead assembly.
- Label width guide adjustment helps to ensure proper tracking of the label stock .
- The black mark sensor slides back and forth to position the sensor over the black mark on the label. It can move from the inside edge to the printhead center.

3400 Removal and Replacement

Tools Required

1- #1 Phillips Screwdriver
2- #2 Phillips Screwdriver
3- small straight slot screwdriver (like a Intermec screwdriver)
4- medium straight slot screwdriver
5- snap ring pliers
6- 9/64" Allen wrench
7- spring hook tool (optional)
8- #2 Phillips offset screwdriver (optional)

Special Tools

1- Printhead Alignment tool, part number T42374
2- Roller Alignment tool, part number T42389

Do's and Don'ts - Warnings

- Do not remove the motor plate, located on the electronics side of the printer, because factory alignment will be lost.
- Do not remove both top and bottom outboard plates, located on the label supply side, at the same time. Factory alignment will be lost.
- When removing any of the hubs, make note of the thick and thin washer locations so the hub can be properly re-assembled.
- When removing the lower belt, make note of the way it is twisted between the two pulleys.

Cover Removal

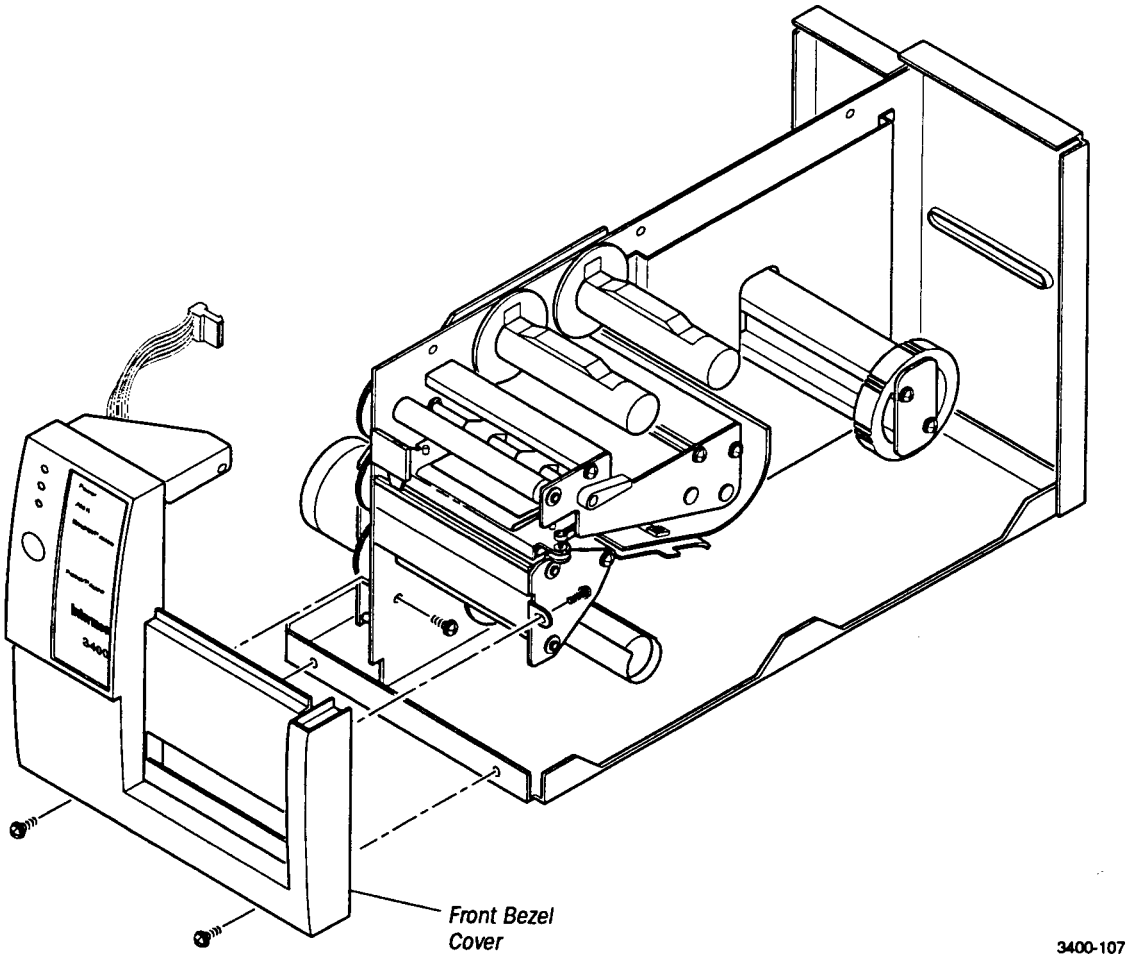
All covers are independently removable.

Media Supply Cover

The lower part of the cover is held onto the printer by 3 magnetic strips that are attached to the bottom plate of the printer. Lift the cover from the middle bottom and pull the cover away.

Front Bezel Cover

There are 5 screws that attach the cover to the printer. Remove the 5 screws and the display PCB cable from the front cover.



Removing the Front Bezel Cover

Electronics Cover

There are 6 screws holding the electronics cover to the printer, three on the top and 3 on the bottom of the cover.

Rear Cover

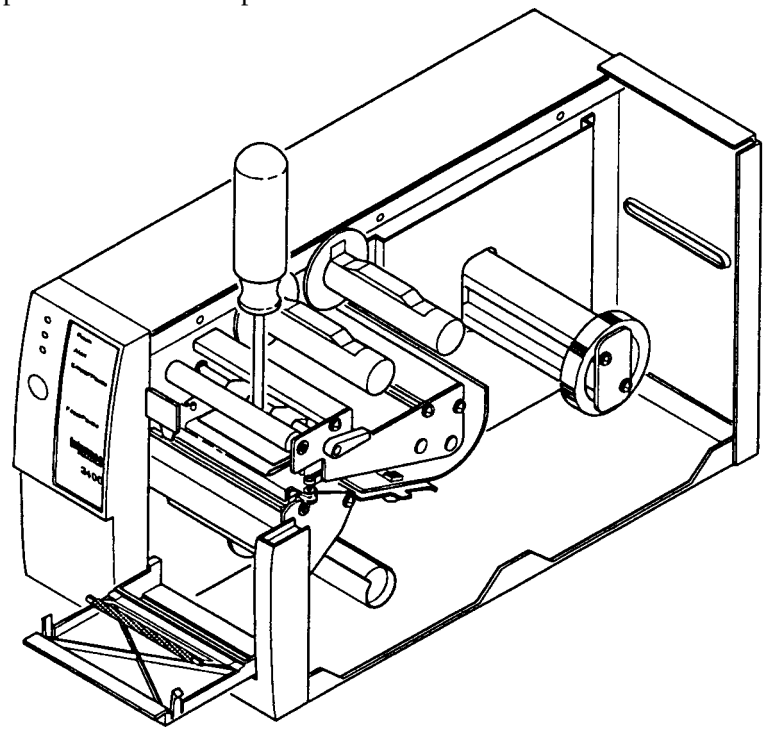
There are 5 screws that hold the rear cover to the printer. Remove the 5 screws and the rear cover comes off independently from the rest of the printer.

Printhead Removal

1- Remove the label supply side cover. Raise the printhead lever and remove any media in the label path.

2- Use a straight slot screwdriver to loosen the printhead retaining screw, located in the center of the printhead heat sink. The screw is easier to loosen if you place one of your fingers underneath the printhead, between the printhead and the platen roller.

3- Remove the printhead cable. Place the fingers of your other hand on the printhead connector to guide the printhead out of the printer.



Removing the Printhead

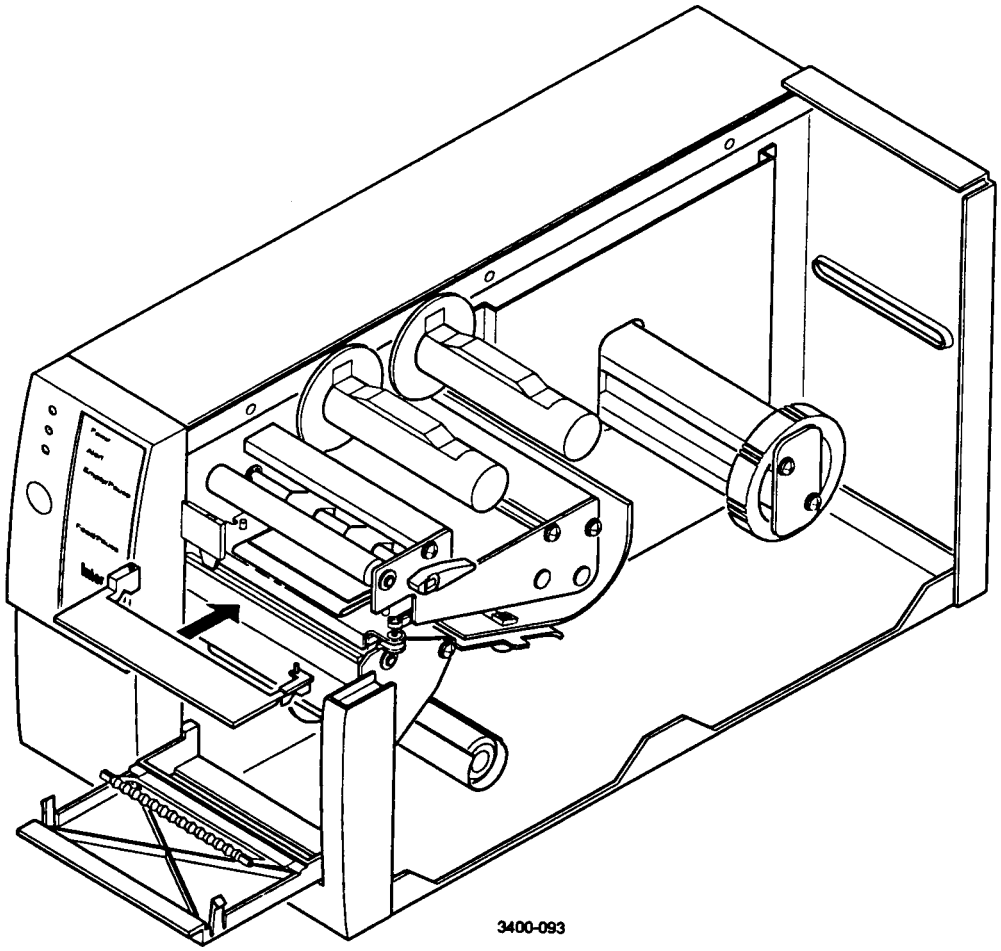
Note: *Printhead alignment is not normally needed when removing and replacing a printhead.*

Printhead Alignment

1- Remove the label supply side cover. Raise the printhead lever and remove any media in the label path. The printhead must be installed in the printer.

2- Loosen the 2 9/64 inch Allen screws located on the printhead yoke, in back of the printhead heat sink. Make sure the printhead fore/aft adjustment lever is in the neutral position.

3- Install the printhead alignment tool, T42374, and press the printhead assembly down on the platen roller. Make sure the alignment tool is straight and level when viewed from the front. Tighten the 2 9/64 inch printhead yoke screws and remove the printhead alignment tool.



Inserting the Printhead Alignment Tool (T42374)

Note: *Although printhead alignment should not be attempted without the printhead alignment tool, it is possible.* ***1)*** *Loosen the 2 9/64 inch printhead yoke screws, turn the printer on and print a test label while manually moving the printhead position to find the best print position.* ***2)*** *Tighten the printhead yoke screws.*

Printhead Cable

1- Remove both side covers, the label supply side cover and the electronics cover.

2- Disconnect the cable from the printhead and the main PCB.

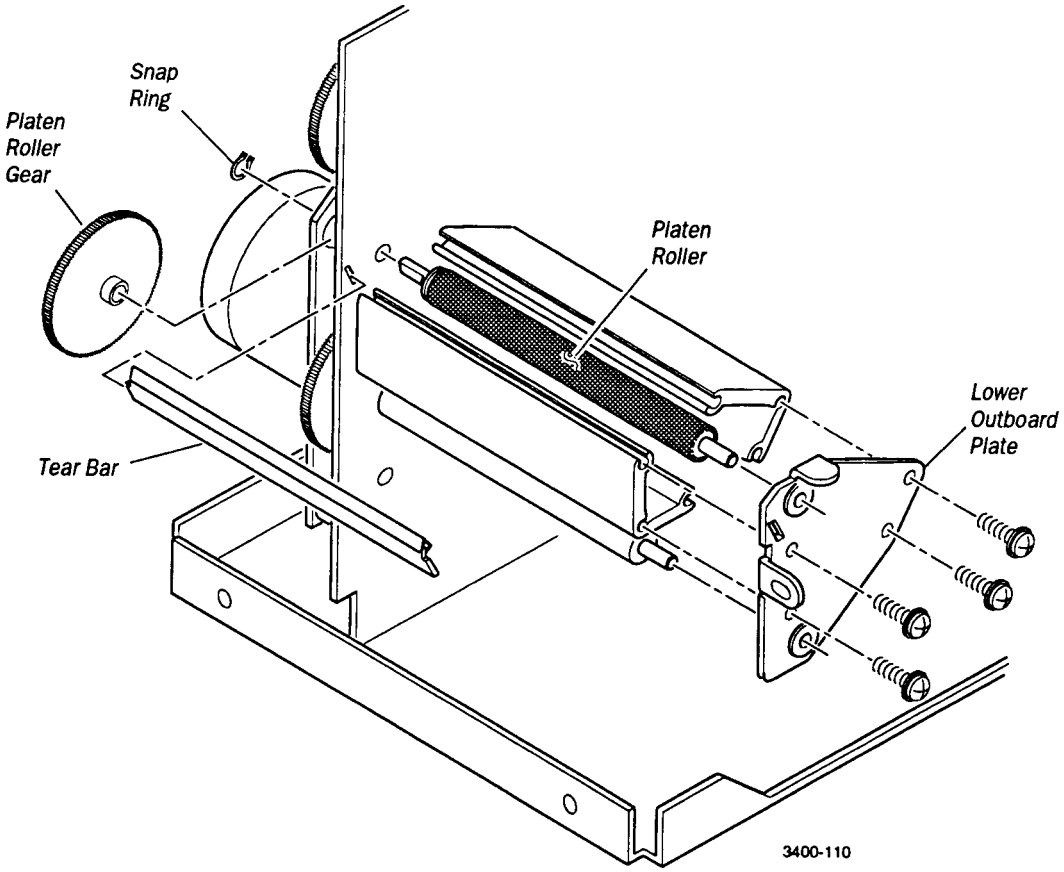
3- Feed the cable through the printers center plate from the electronics side to the label supply side.

Notes on re-assembly:

Make sure the ribbon cable is folded the same as the cable that was removed. Feed the cable through the printers center plate from the label supply side to the electronics side.

Platen Roller

1- Remove the media supply cover, the electronics cover, and the front bezel cover.
2- On the electronics side of the printer, remove the platen roller gear snap ring through the access hole in the motor frame.
3- Remove the lower outboard plate, located on the media supply side of the printer.
4- Remove the platen roller. Make note of any washers and their position.
5- Use the roller alignment tool, part number T42389, during re-assembly for proper alignment of the outboard plate.



Removing the Platen Roller

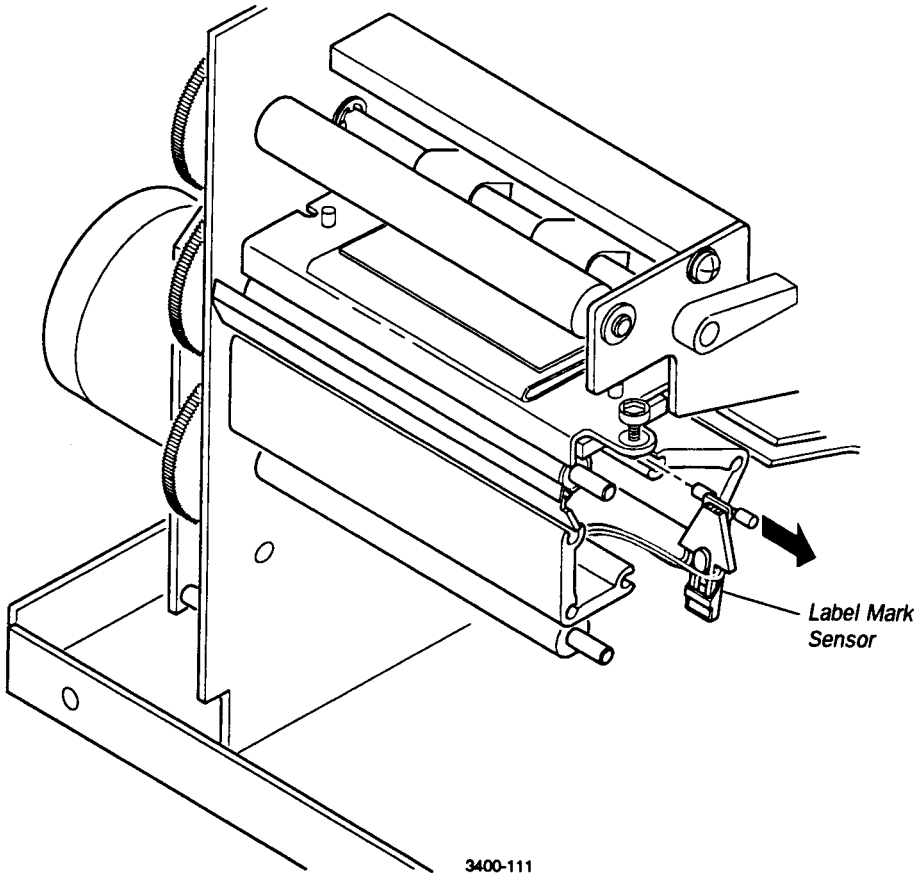
Note: *When re-installing the lower outboard plate, don't forget to replace the tear bar plate.*

Label Mark Sensor

1- Follow steps 1 to 4 of the Platen Roller Replacement instructions above.

2- Disconnect the black mark sensor cable from the main PCB and slide the sensor out from the extrusion.

3- Use the roller alignment tool, part number T42389, during re-assembly for proper alignment of the outboard plate.



Removing the Label Mark Sensor

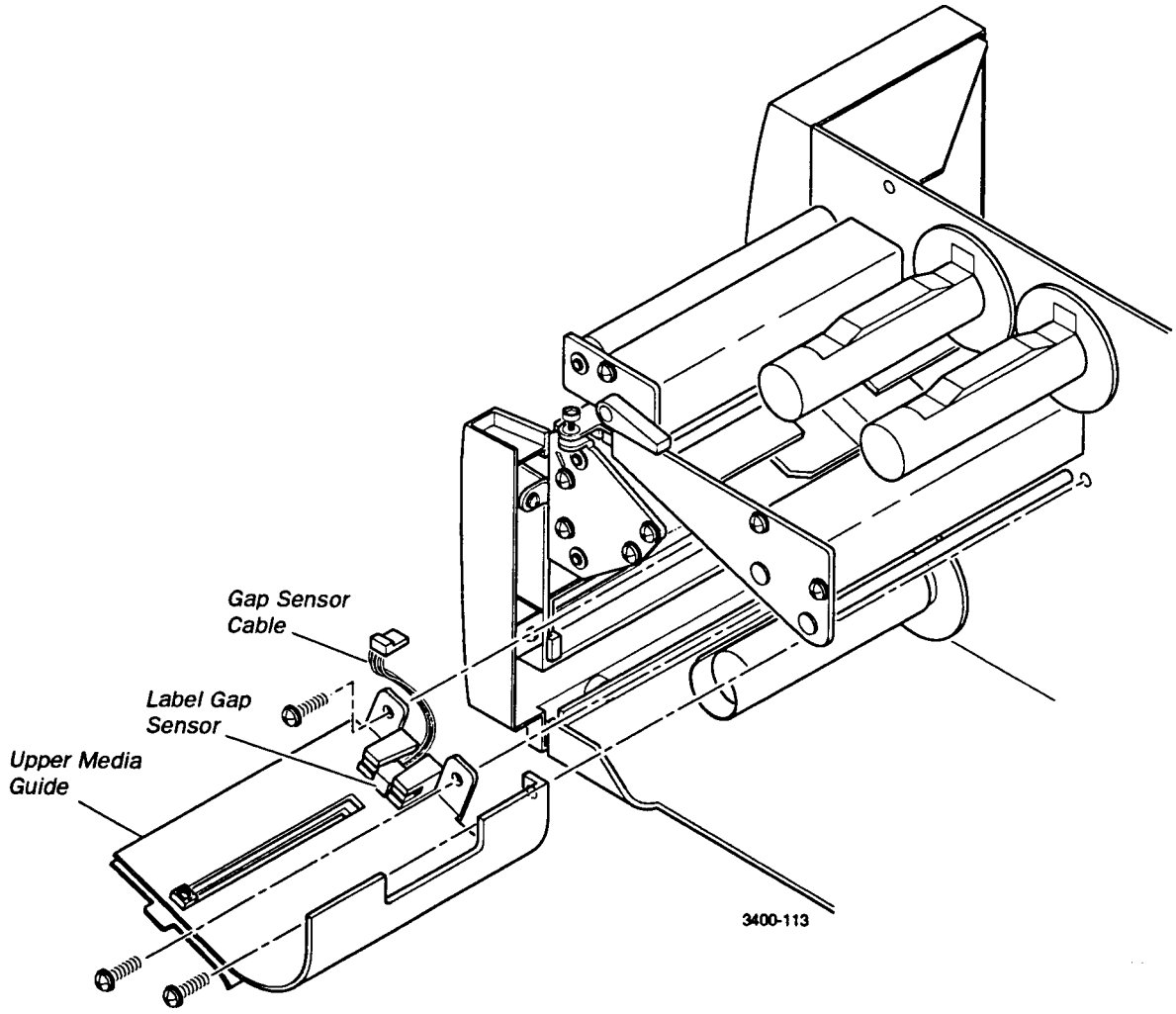
Label Gap Sensor

1- Remove the label supply cover and the electronics cover.

2- Disconnect the gap sensor cable from the main PCB.

3- Turn the printer on its side so that the electronics side is down and the label supply side is up.

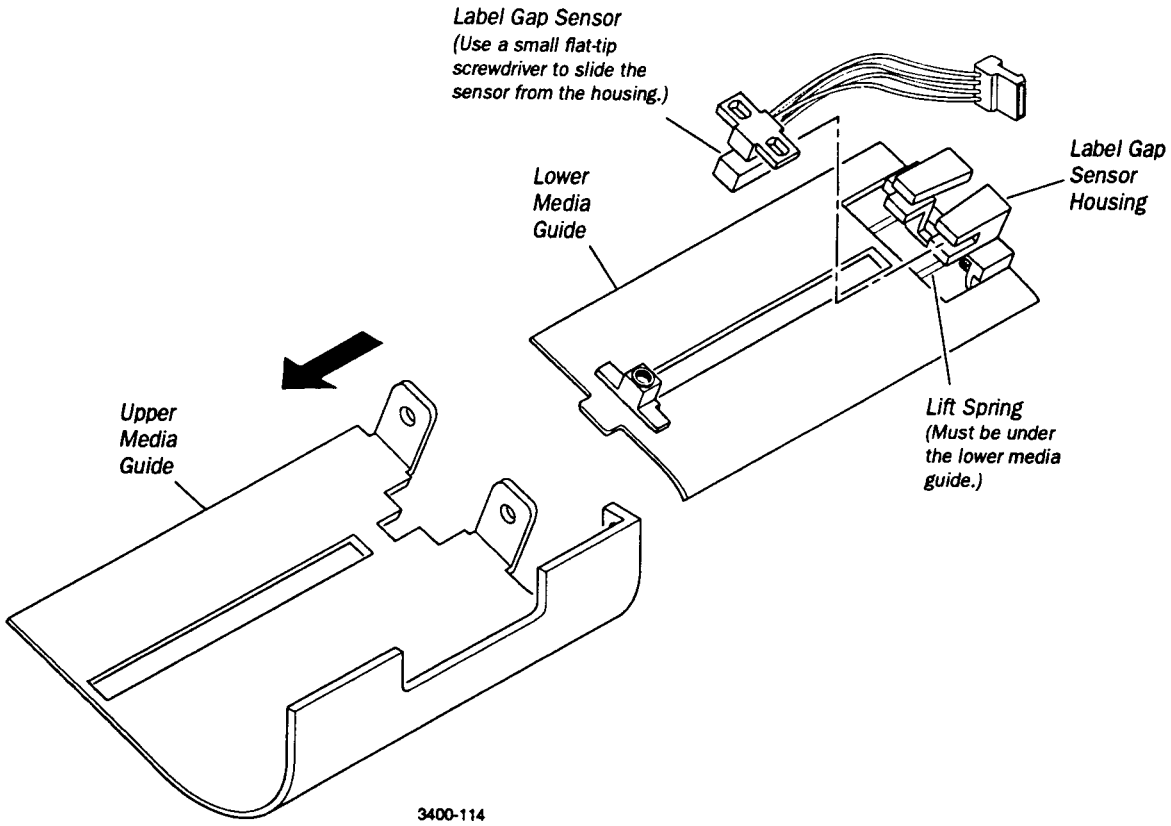
4- Remove the 3 screws that hold the media guide assembly and remove the media guide assembly from the printer. Be careful with the label gap sensor cable.



Removing the Media Guide

5- Slide the 2 pieces of the media guide assembly apart.

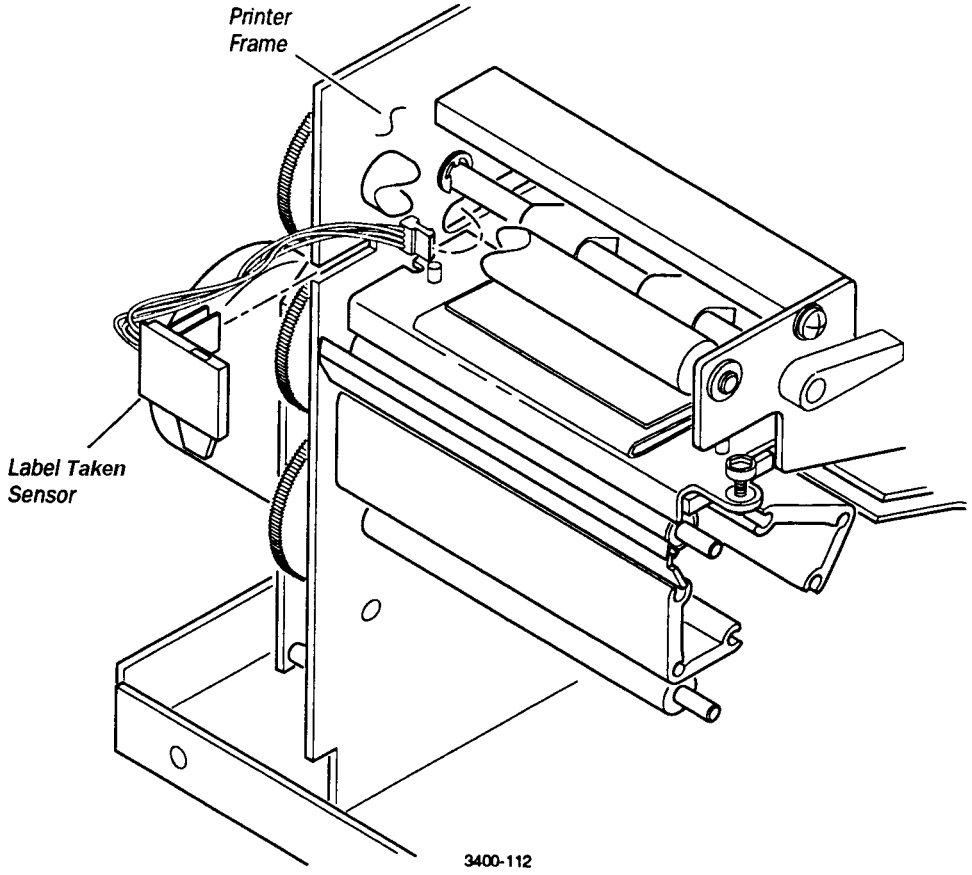
6- Remove the label gap sensor from its housing by prying at the sides between the housing and the sensor.



Removing the Label Gap Sensor

Label Taken Sensor

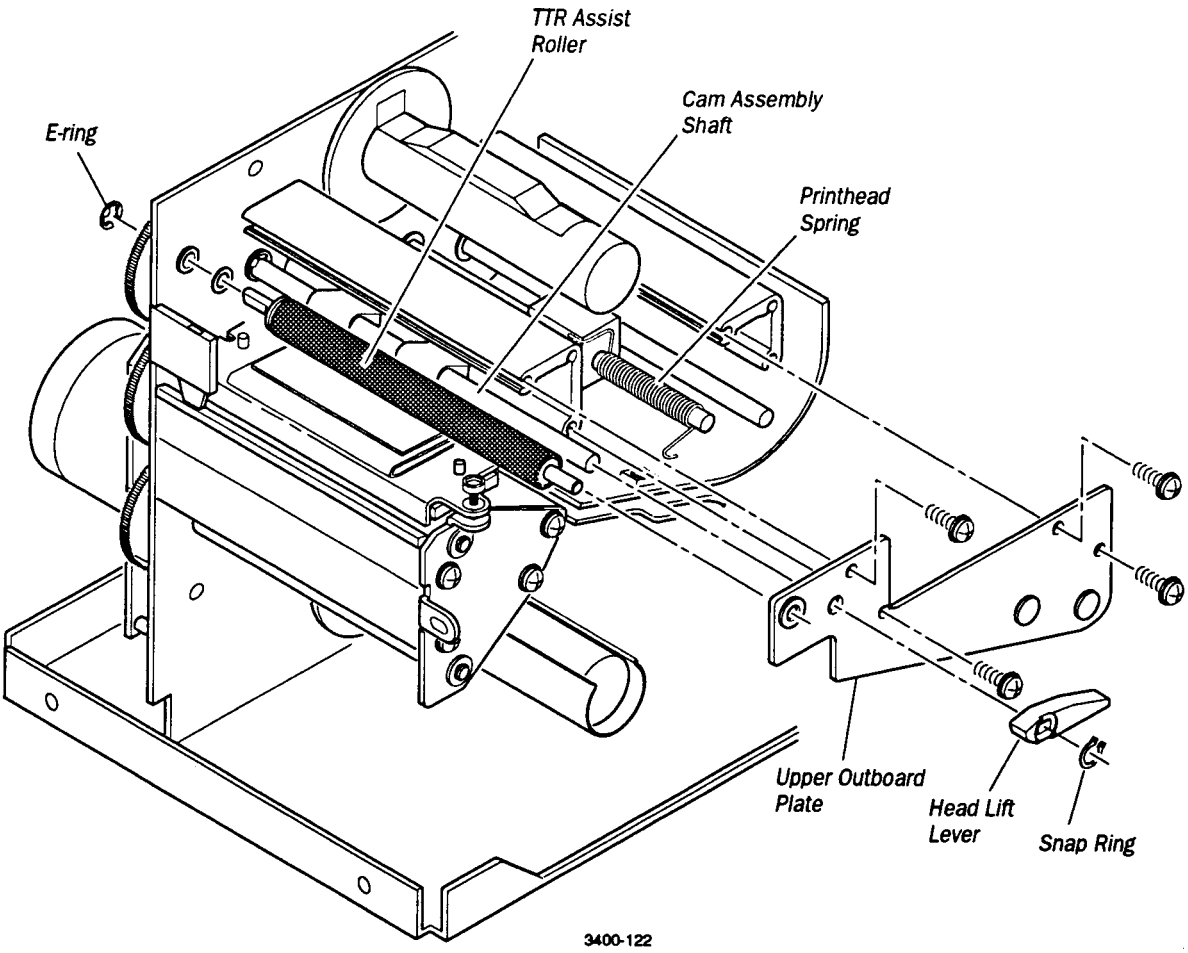
1- Remove the front bezel cover.
2- Disconnect the label taken sensor cable from the main PCB.
3- Slide the sensor housing from the printers center plate.



Removing the Label Taken Sensor

Ribbon Assist Roller

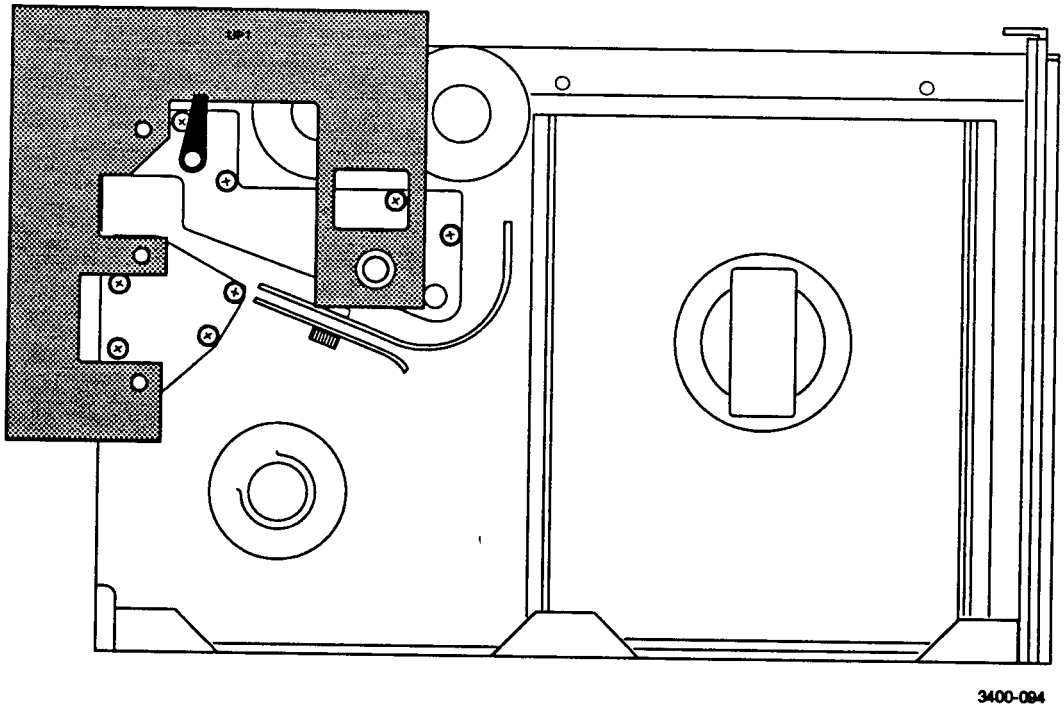
1- Remove both side covers, the label supply side cover and the electronics cover.
2- Remove the ribbon roller gear snap ring, located on the electronics side. Put the printer on its side so the electronics side is down and the label supply side is up.
3- Remove the printhead handle snap ring.
4- Remove the 4 screws that secure the upper outboard plate. Remove the upper outboard plate.
5- The ribbon assist roller can now be removed.
6- Use the roller alignment tool, part number T42389, during re-assembly for proper alignment of the outboard plate.



Removing the Ribbon Assist Roller

Note on re-assembly:

The printhead spring is the most difficult part to re-install. There are 2 ways of doing this, 1) Put the complete assembly together and then hook the spring around the upper plate; 2) Hook the spring around the upper plate before installing the plate.



Positioning of the Roller Alignment Tool (T42389)

Printhead Assembly with Heat sink and Yoke Plate

1- Same as ribbon assist roller procedure above.

Note on re-assembly:

The printhead assembly yoke plate (pivot block) is <u>not</u> symmetrical. The heavier end goes toward the inside of the printer. If the yoke plate is installed wrong, print will be shifted approximately 1/10 inch.

Ribbon Take-up and Label/Liner Take-up Hub

Note: *These 2 hubs have identical one-way 12 in/oz. clutches attached.*

These hubs have a thick/thin washer combination next to the printers center plate. The thick washer goes on the electronics side and the thin washer goes on the label supply side of the center plate.

1- Remove both printer side covers.
2- Remove the hub snap ring located on the electronics side motor plate.
3- Remove the hub.

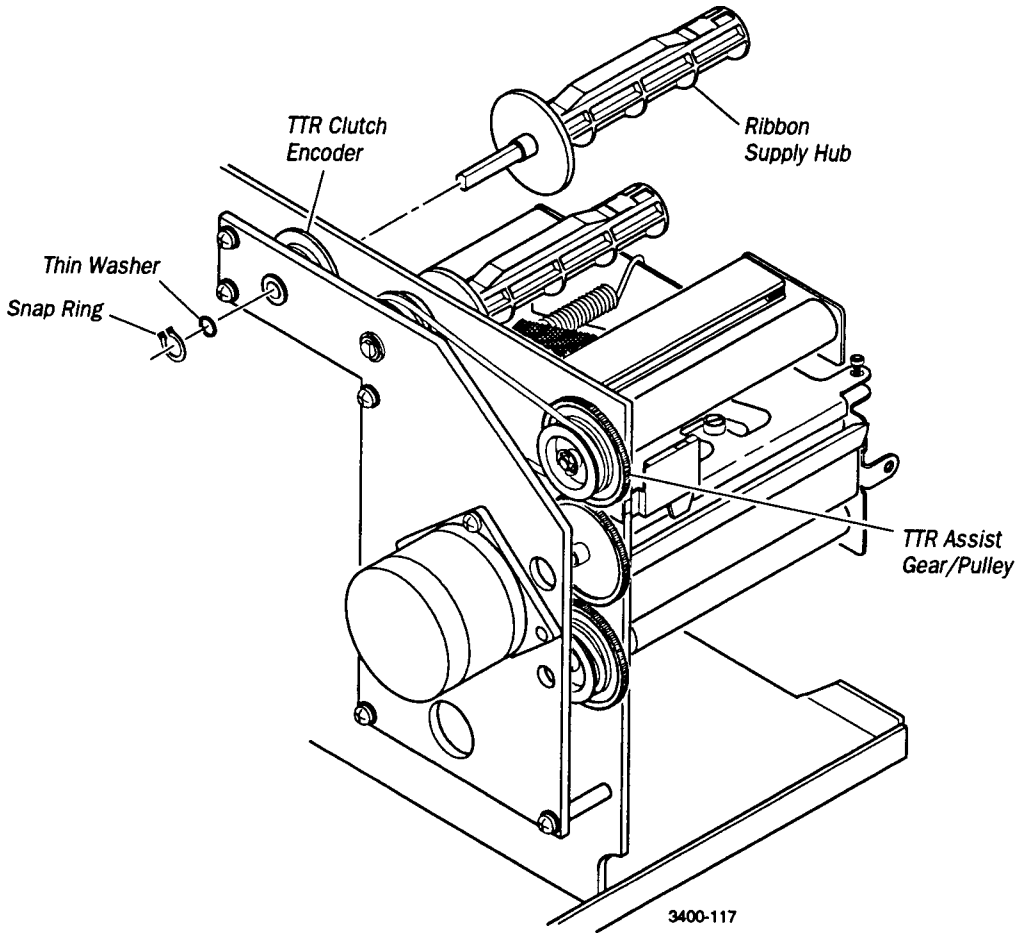
Ribbon Supply Hub

Note: *This hub has a friction clutch with 14 in/oz. of drag force.*

This hub has a thick/thin washer combination next to the printers center plate. The thin washer goes on the electronics side and the thick washer goes on the label supply side of the center plate. This gives the supply hub a 0.050 inch outward offset compared to the ribbon take-up hub.

The ribbon supply hub also has the encoder label that provides markings for ribbon motion detection. The actual ribbon encoder sensor is located on the main PCB.

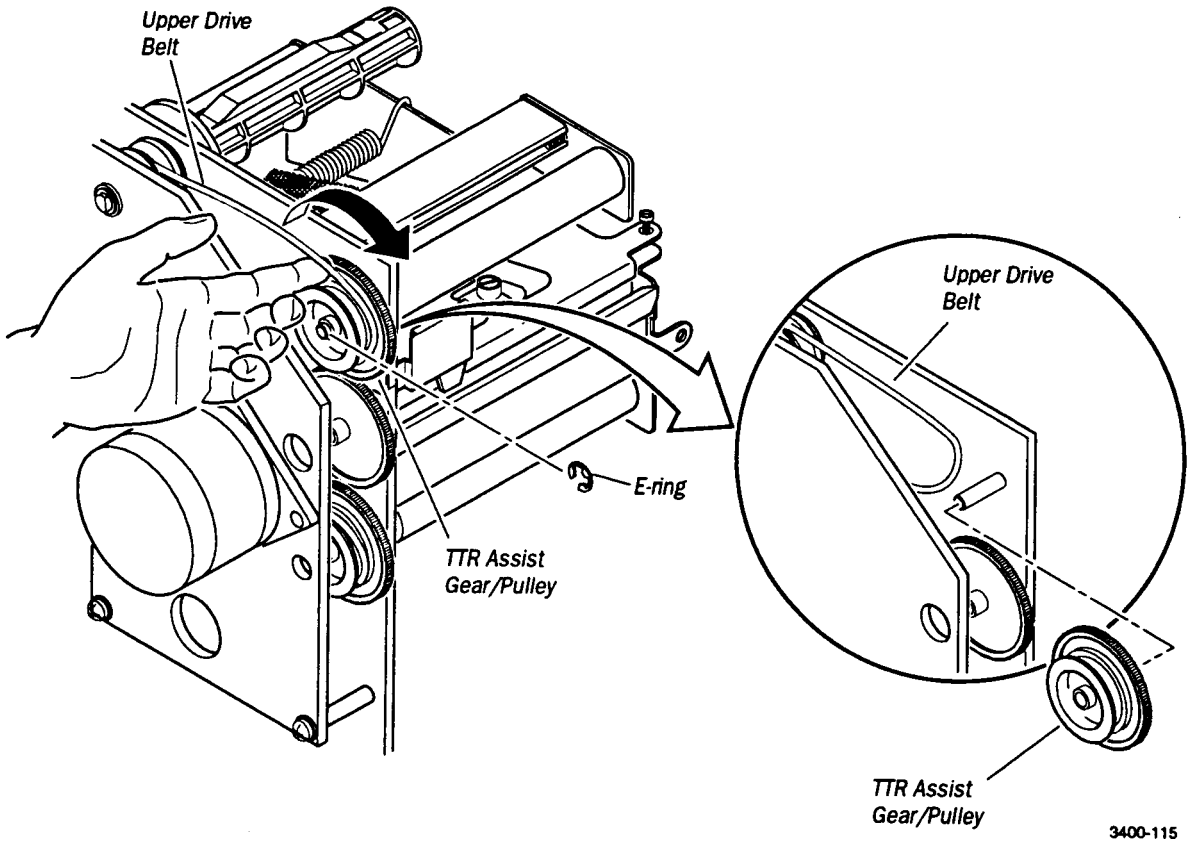
1- Follow steps 1 through 3 of the Ribbon Take-up and Label/Liner Take-up procedure above.



Removing the Ribbon Supply Hub

Ribbon Take-up Hub Drive Belt

1- Remove both side covers, the label supply side cover and the electronics cover.
2- Remove the ribbon take-up hub snap ring located on the electronics side motor plate.
3- Remove the ribbon take-up hub and the belt.



Removing the Ribbon Takeup Drive Belt

Stepper Motor

Note: *The motor is retained with a longer #8 screw (1/2 inch). The motor screws go into a nut plate that is captured on the motor plate.*

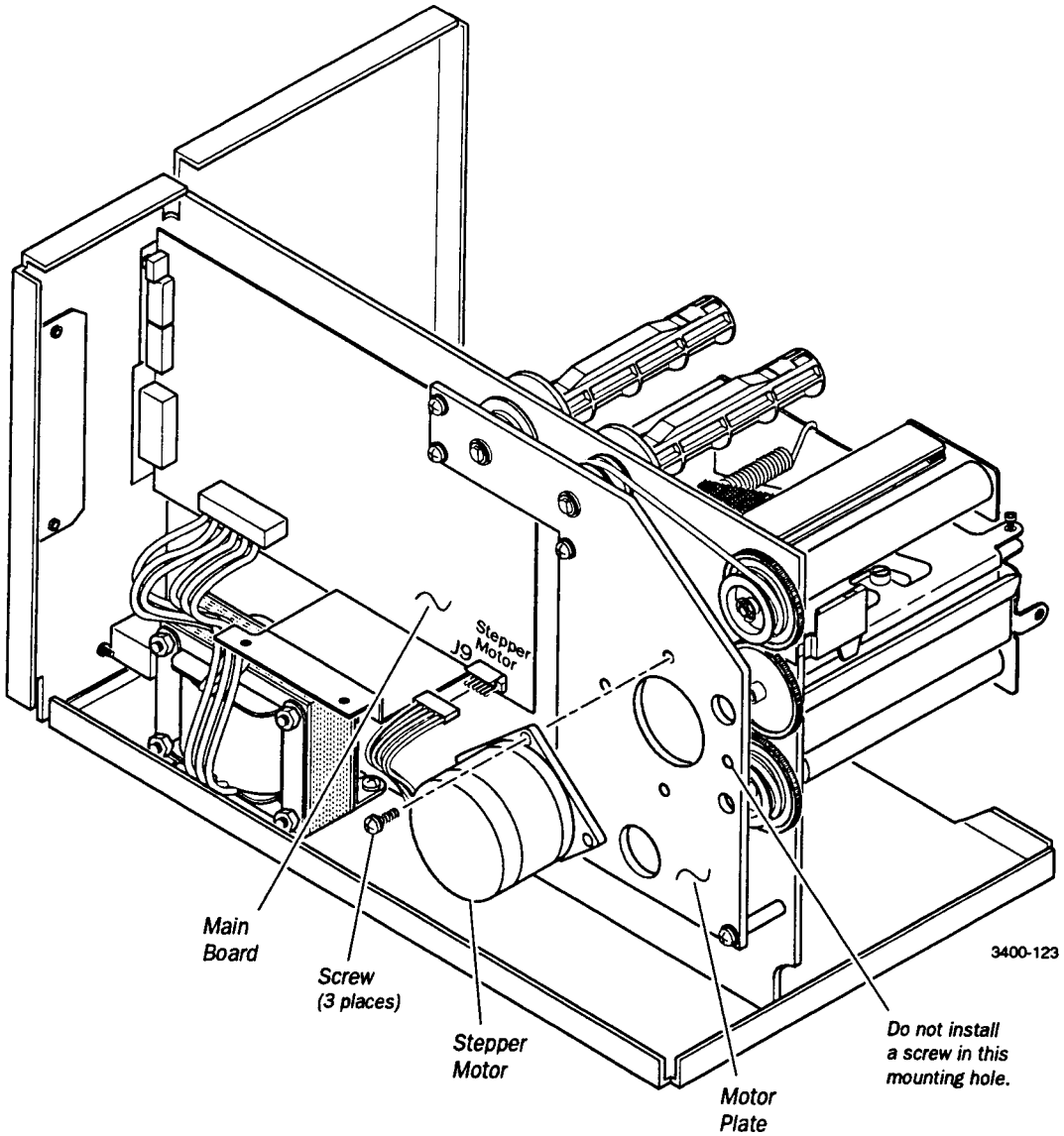
When re-installing the motor, make sure the motor cable is pointing towards the back of the printer.

When re-installing the motor, adjust the motor gear so that it engages with the 2 opposing gears without binding or slipping.

1- Remove the electronics side cover.

2- Unplug the motor cable from the main PCB.

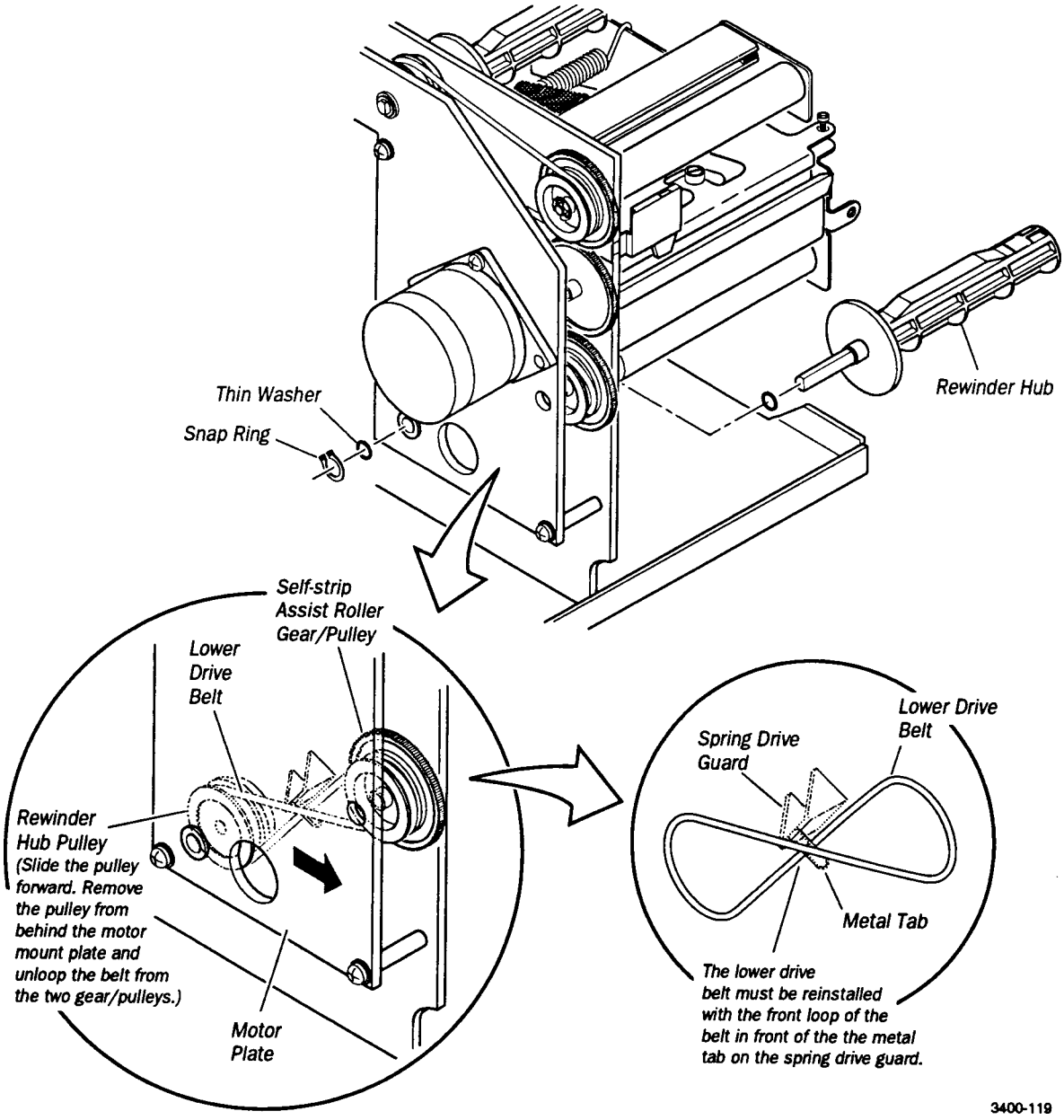
3- Remove the 3 screws holding the motor to the motor plate and remove the motor.



Removing the Stepper Motor

Label/Liner Take-up Hub Drive Belt

1- Remove the electronics side cover and the front bezel cover.
2- Remove the stepper motor (see procedure above).
3- Place the printer on its back so the front of the printer is facing up.
4- Remove the label/liner take-up hub (see procedure above).
5- Remove the drive belt.



Removing the Liner Takeup Hub Drive Belt

Notes on re-assembly:

When re-assembling the belt, remember that the belt has a twist between pulleys. The belt twist is separated by a plastic wear block. The belt should be on the outside of the wear block when coming from the rear side of the lower pulley. The belt should cross on the inside of the wear block from the front side of the lower pulley.

The twist in the lower belt provides for label/liner hub rotation opposite that of the belts drive pulley.

Put all the pieces in place except for the label/liner take-up hub and its gear/pulley assembly. Place the belt on the gear/pulley with the proper twist and affix it to the label/liner take-up hub shaft.

Label/Liner Assist (Sticky) Roller

1- Remove the media supply cover, the electronics cover, and the front bezel cover.

2- Remove the sticky roller gear 'E' ring by going through the clearance hole in the motor plate, located on the electronics side. Put the printer on its side so the electronics side is down and the label supply side is up.

3- Remove the printhead handle snap ring.

4- Remove the 4 screws that secure the lower outboard plate. Remove the plate.

5- Remove the sticky roller, making note of any attached washers and their position.

6- Use the roller alignment tool, part number T42389, during re-assembly for proper alignment of the outboard plate.

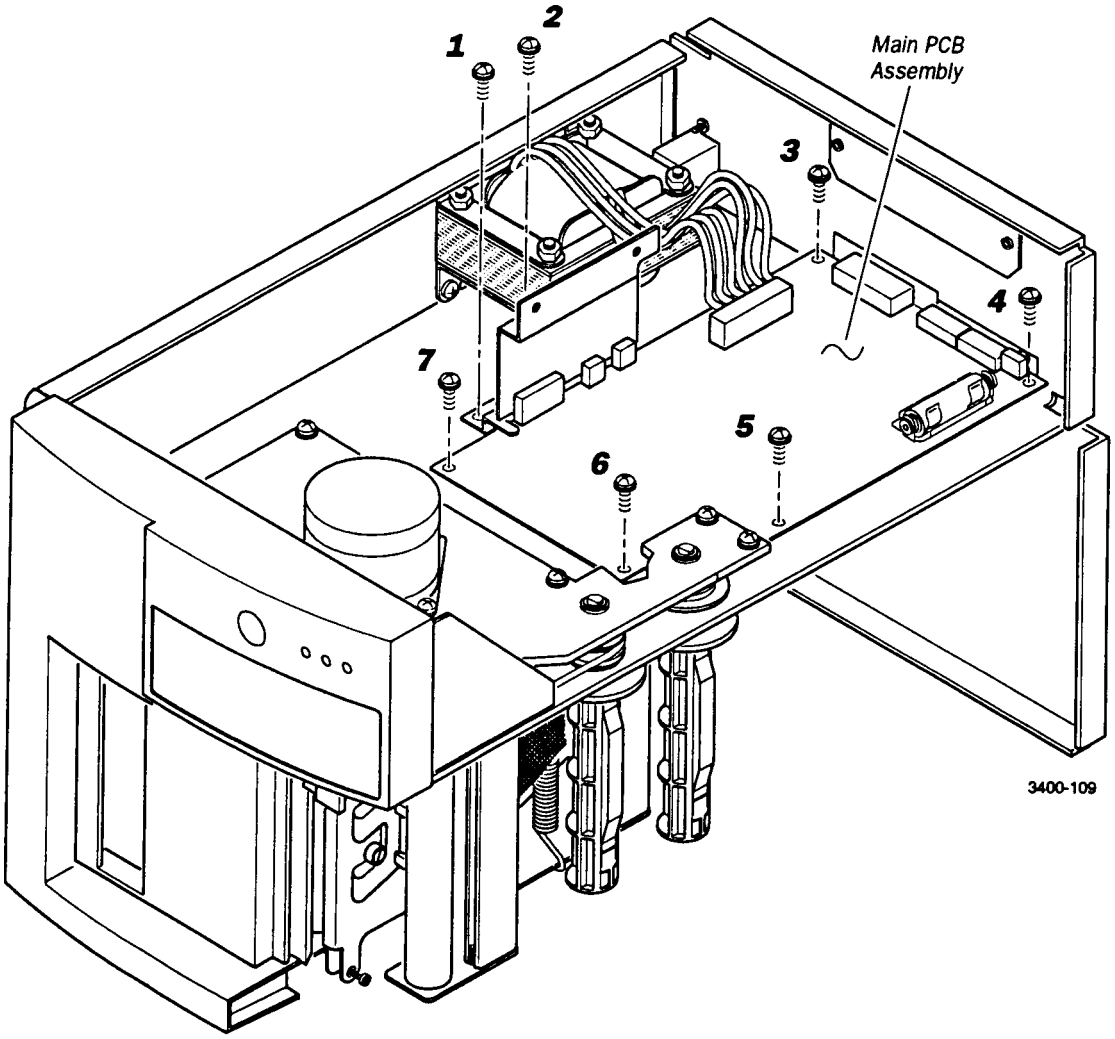
Note: *When re-installing the lower outboard plate, don't forget to replace the tear bar plate.*

Main PCB

1- Remove the electronics side cover. Place the printer on its side with the electronics side facing up.

2- Remove the 7 screws holding the main PCB to the printer

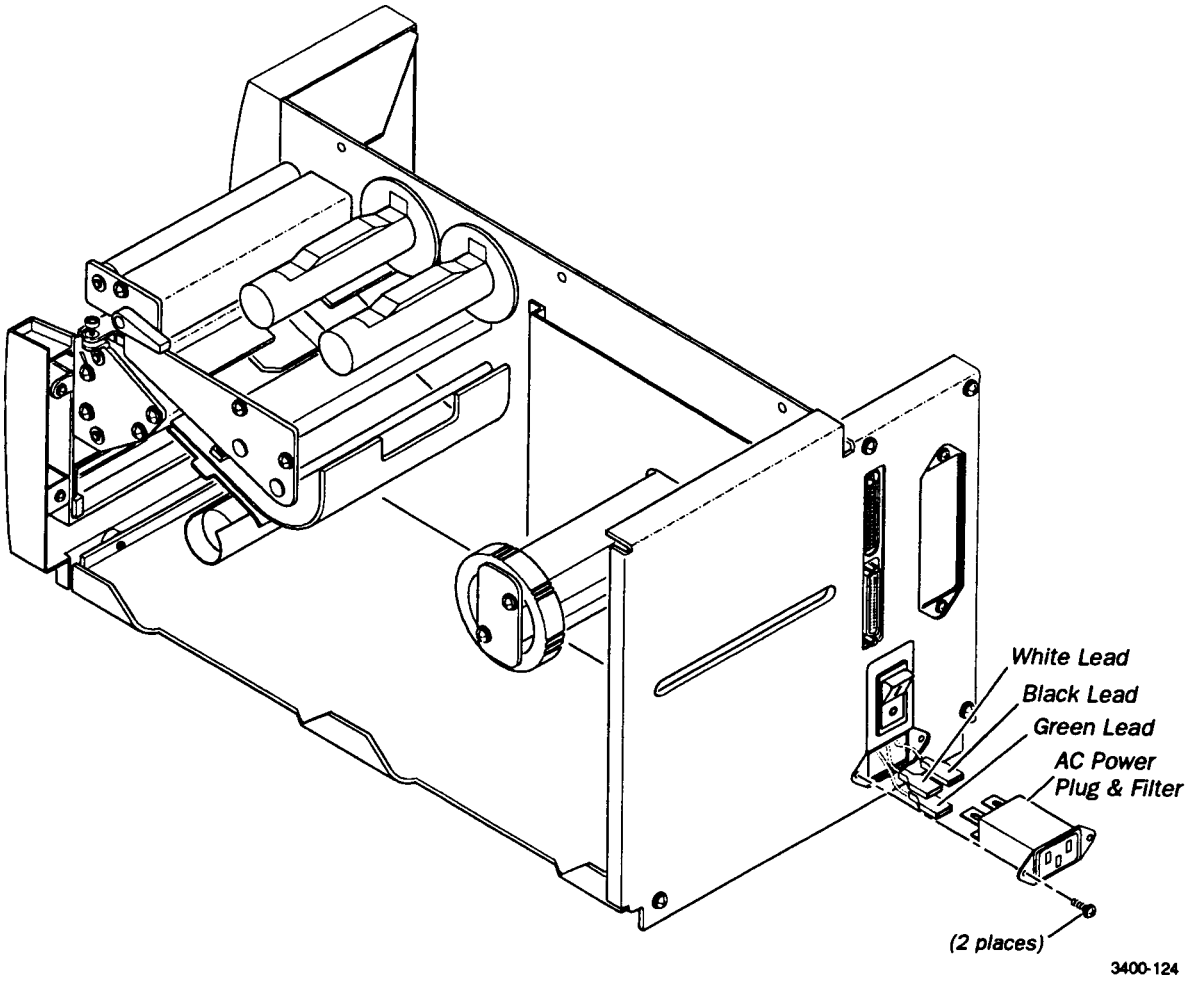
3- Remove the main PCB.



Removing the Main PCB

AC Plug and Input filter

1- Remove the 2 screws located on the back plate of the printer.
2- Remove the 3 push-on connectors that are that are attached to the back of the plug.

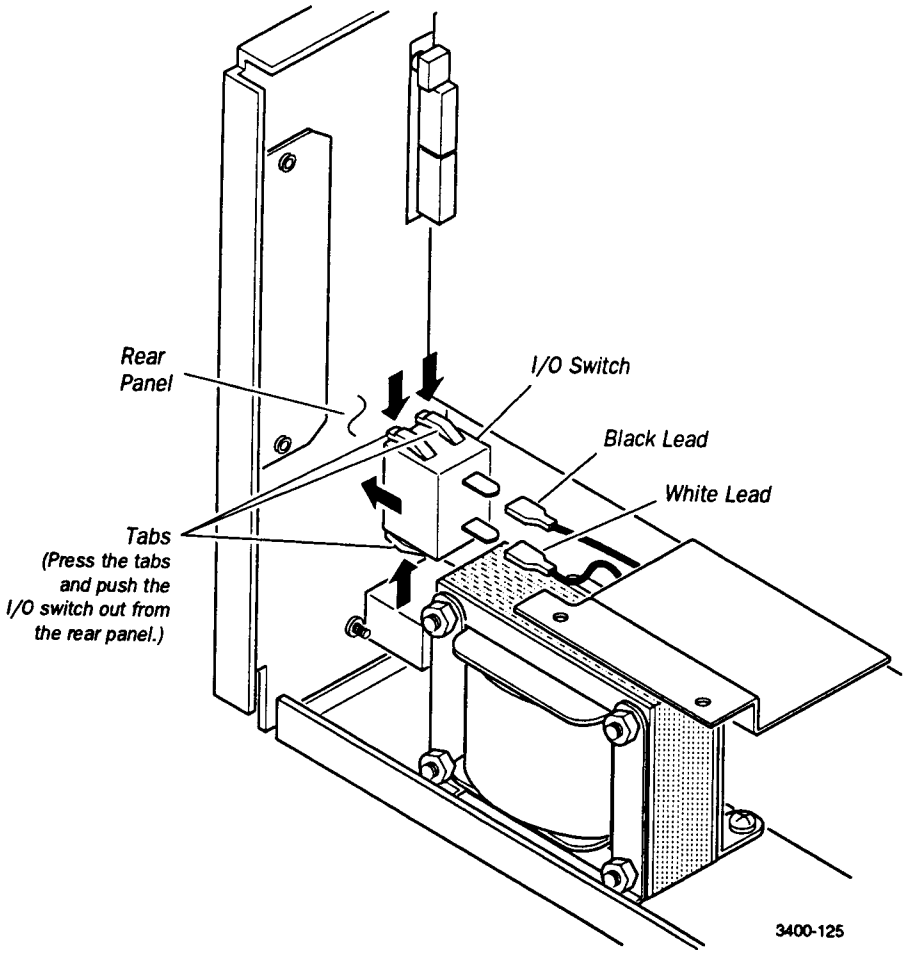


Removing the AC Plug and Filter

Power Switch/Circuit Breaker

Note: *The 220volt printer uses a 1 amp power switch/circuit breaker and the 115volt printer uses a 2 amp power switch/circuit breaker.*

1- Remove the 2 push-on connectors attached to the switch.
2- Compress the tabs that hold the switch secured to the back plate and push the switch out.

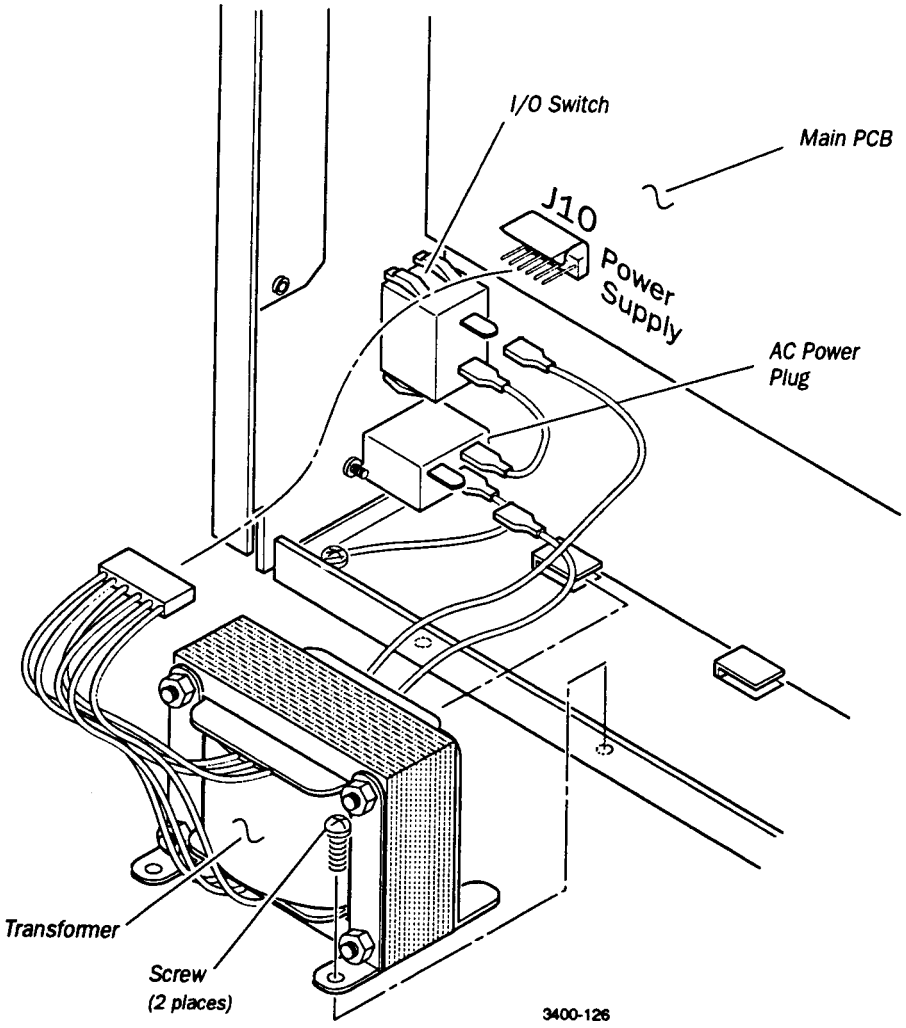


Removing the Power Switch/Circuit Breaker

Transformer

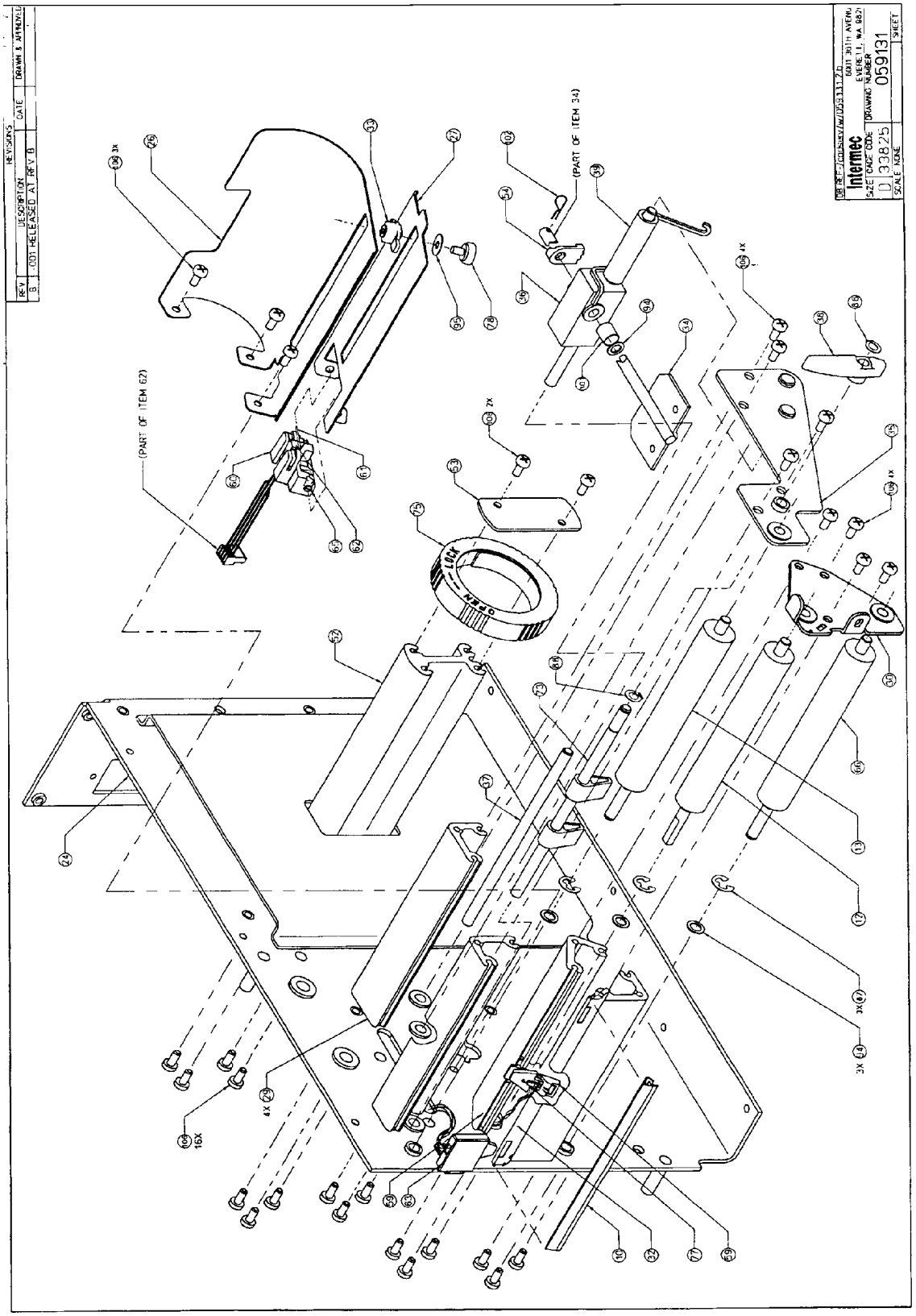
Note: *The printer uses a different transformer for 220volt and 115volt printers.*

1- Remove the electronics side cover.
2- Disconnect the transformer cable from the main PCB.
3- Remove the 2 screws holding the transformer to the printer base and slide the transformer out of the printer.

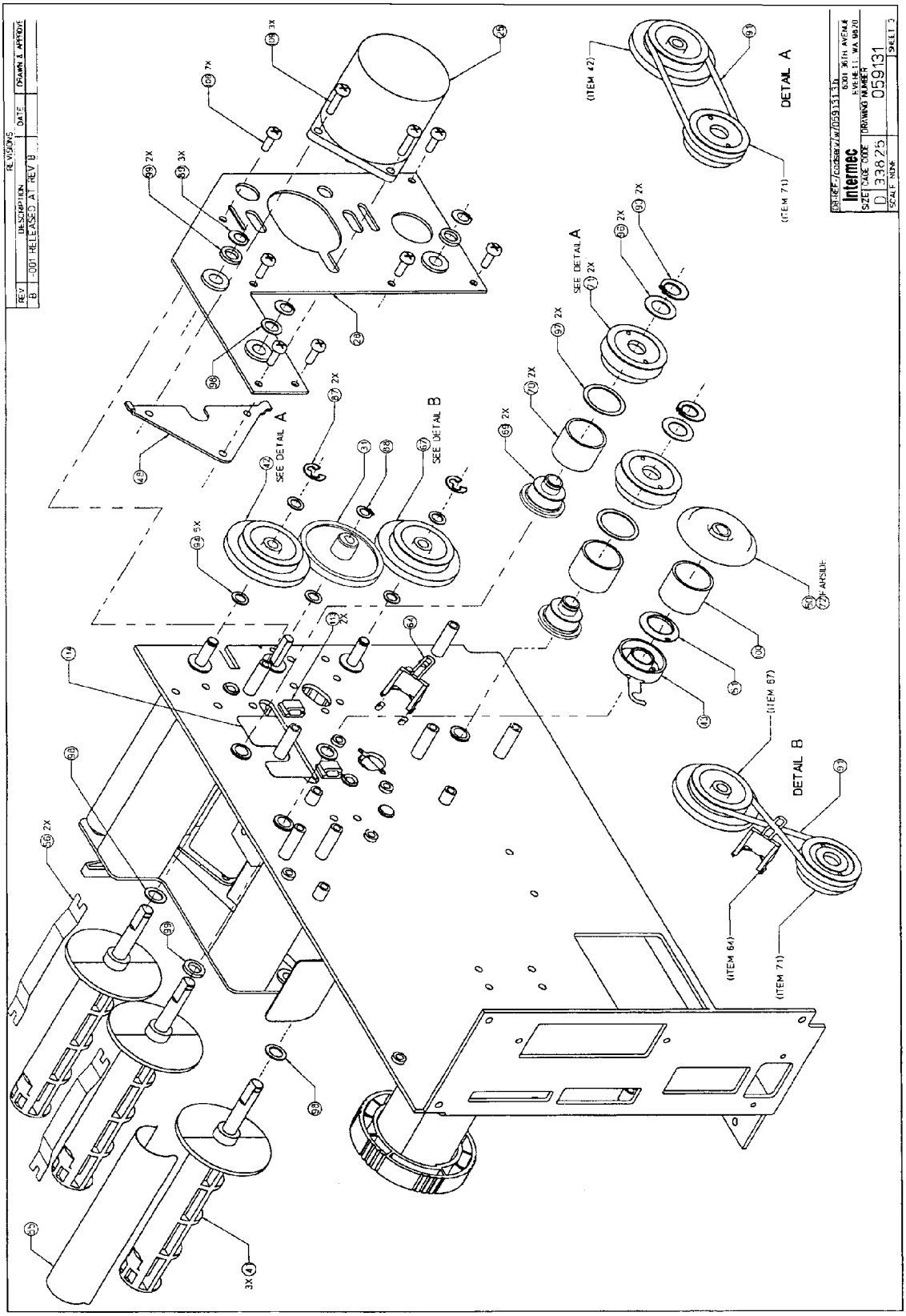


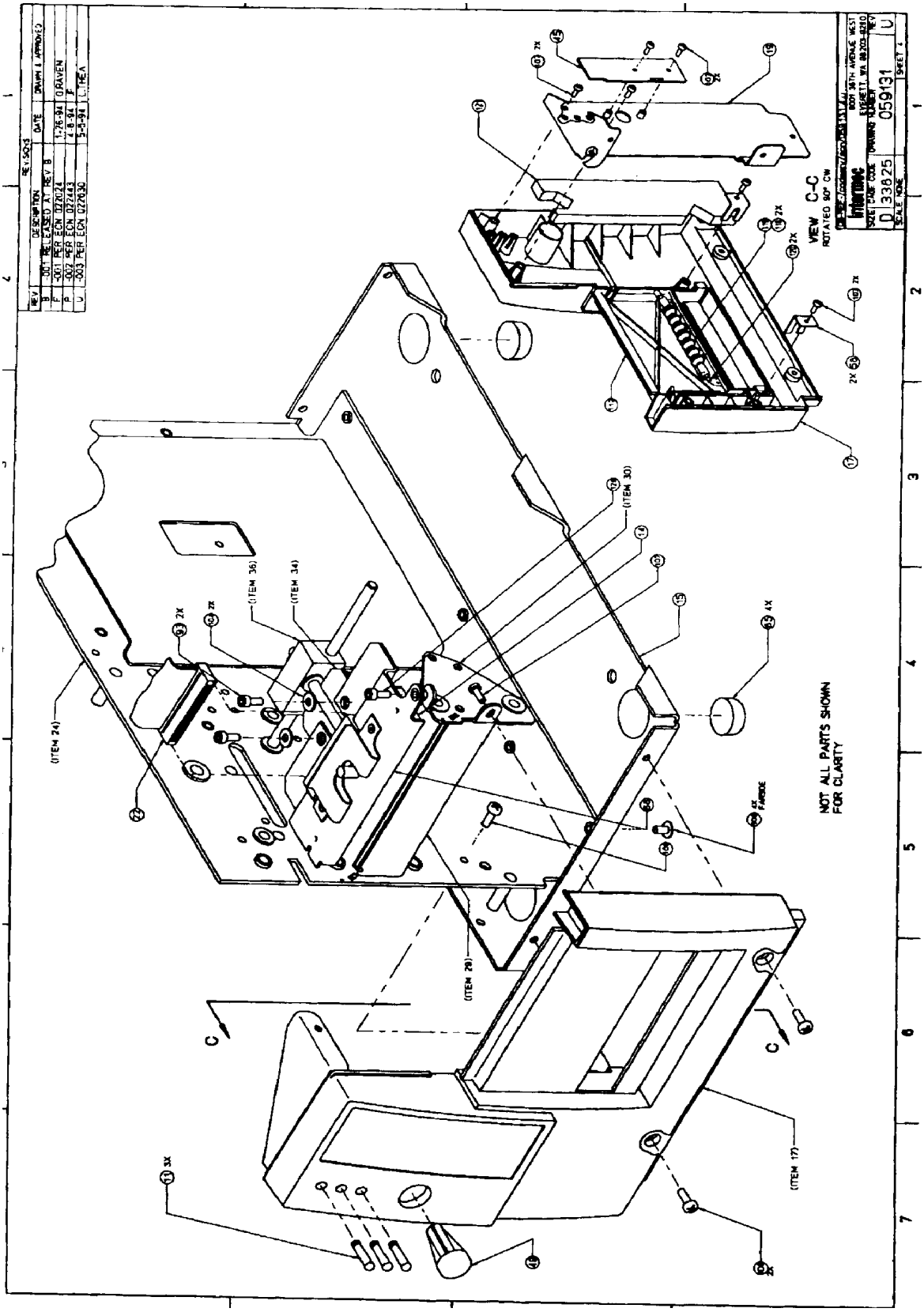
Removing the Transformer

3400 Printer Assembly, Parts Breakdown

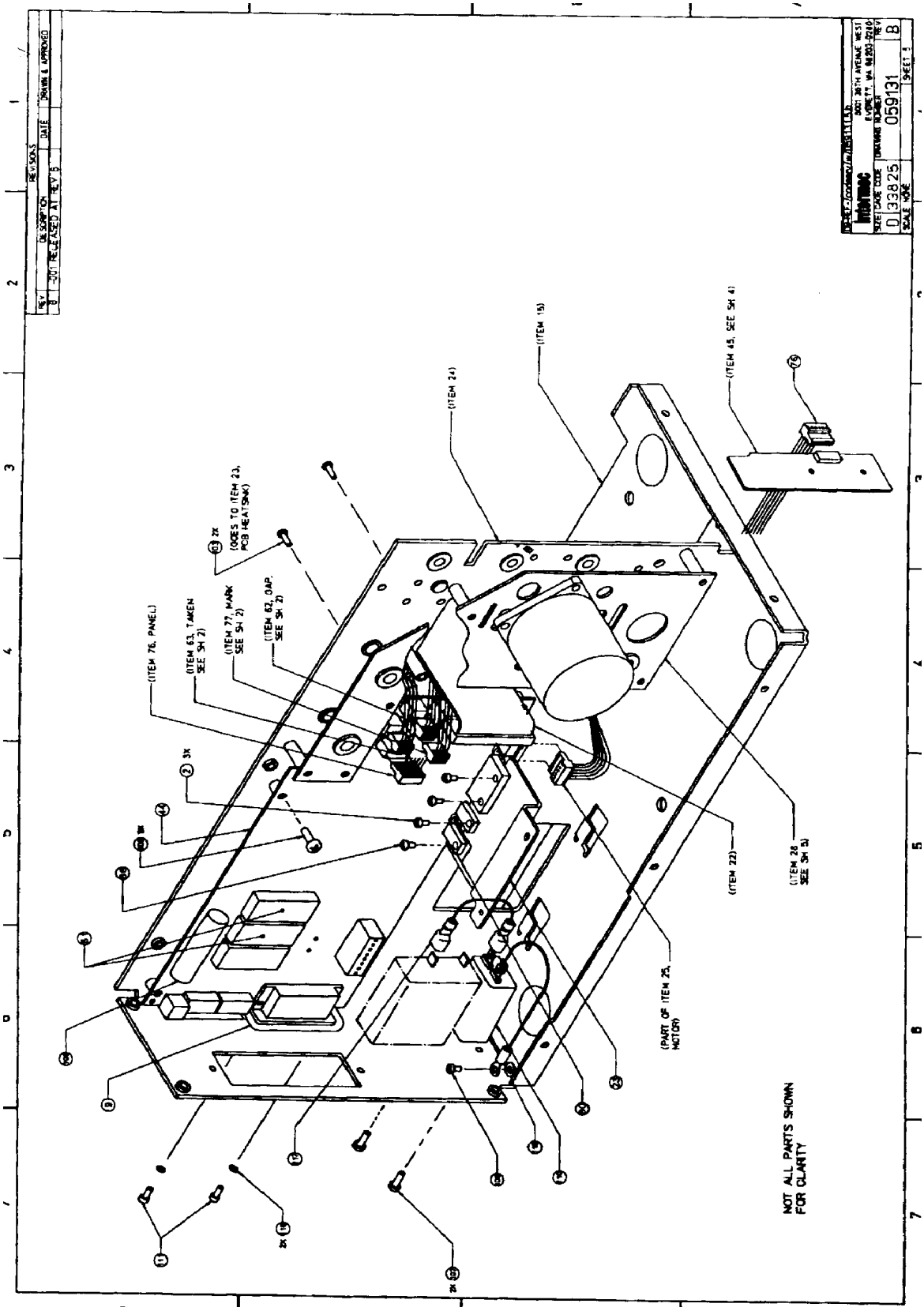


3400 Printer Assembly, Parts Breakdown

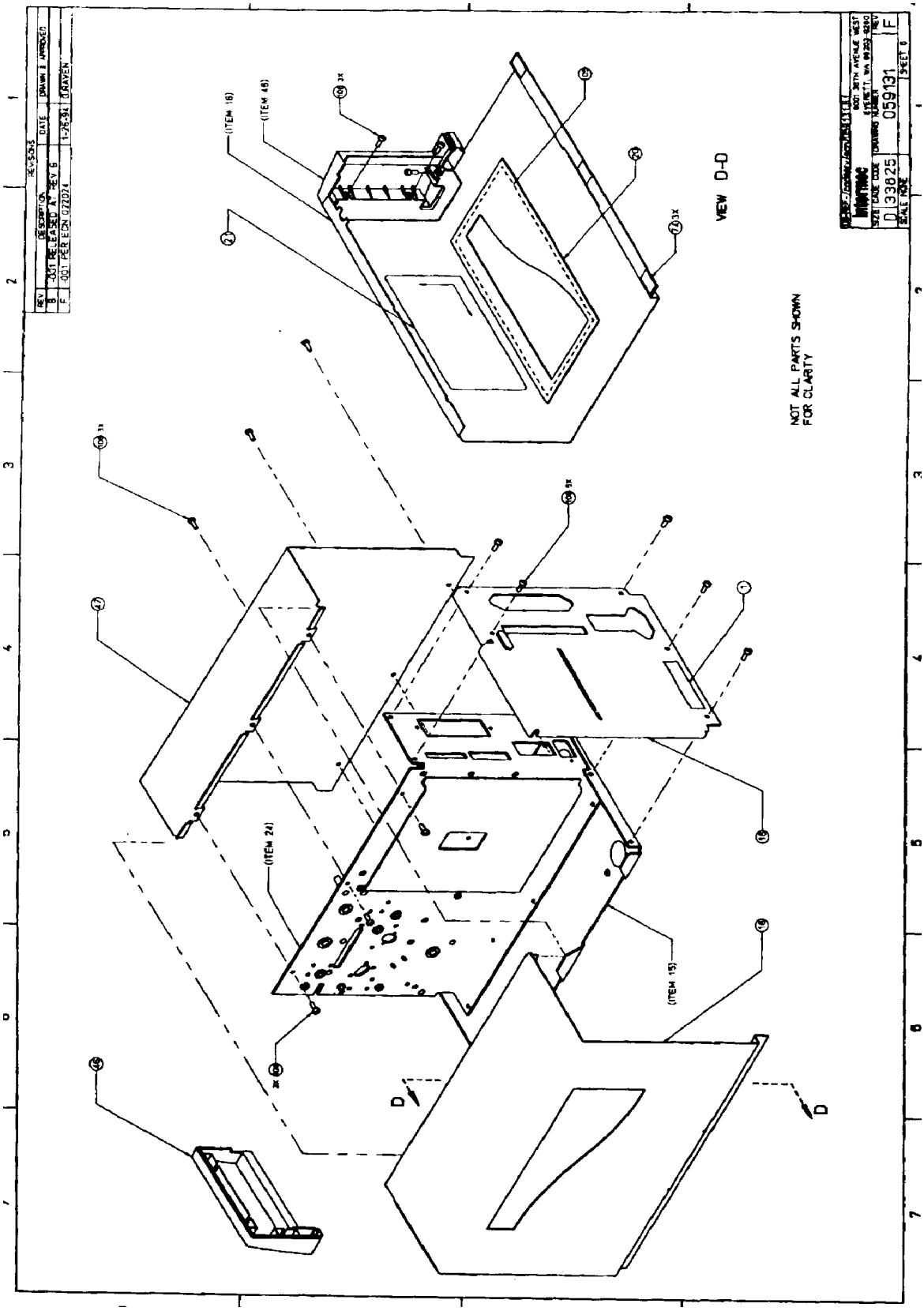



VIEW C-C
ROTATED 90° CW
NOT ALL PARTS SHOWN
FOR CLARITY
(ITEM 74)
(ITEM 36)
(ITEM 34)
(ITEM 30)
(ITEM 29)
(ITEM 17)
059131

3400 Printer Assembly, Parts Breakdown



3400 Printer Assembly, Parts Breakdown



3400 Printer Assembly Item List

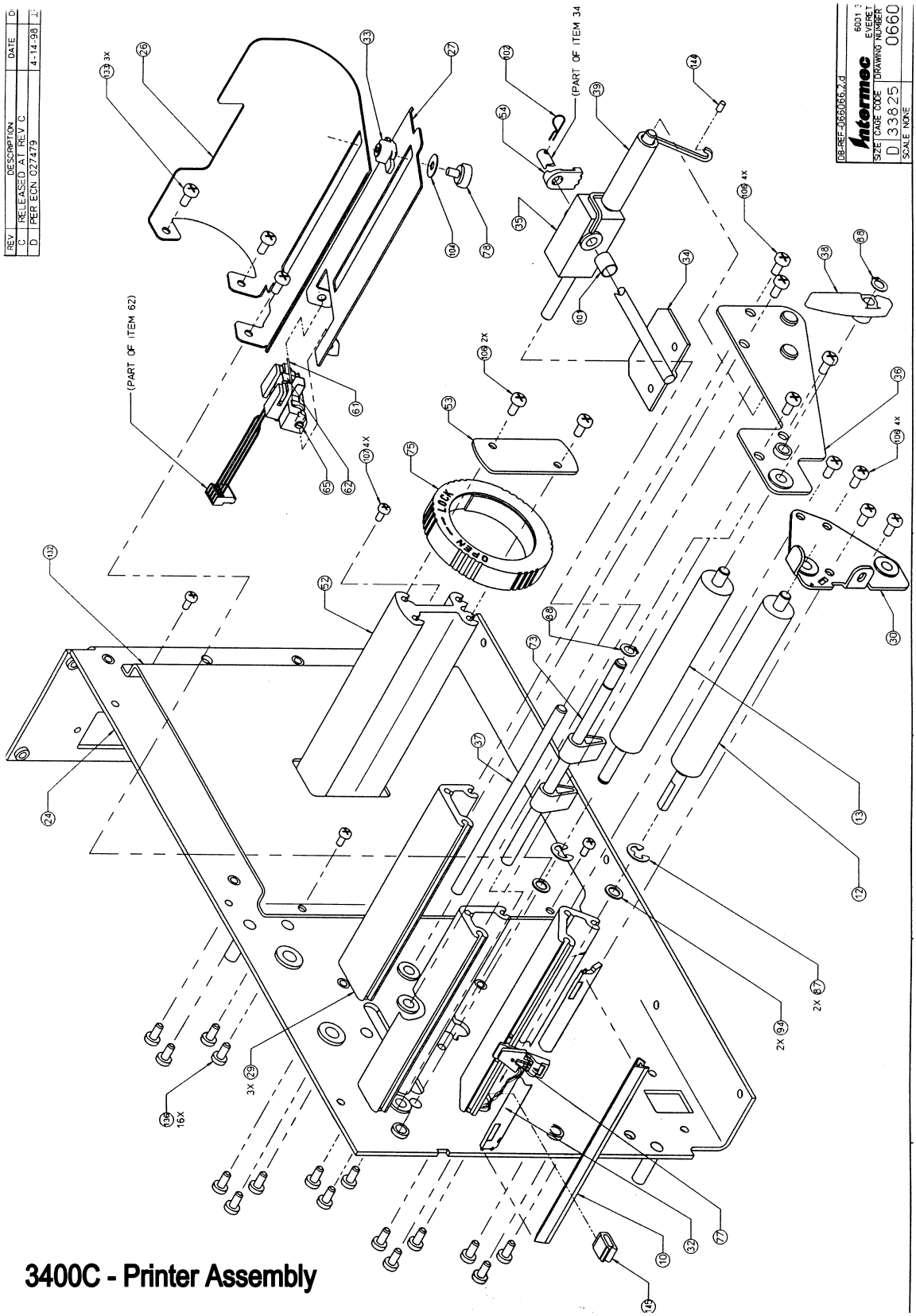
1	0.001	RL	E02024	LBL 0.51O x 2.50 4MIL POLY PERM
2	3		505312	SCREW, PHM, PHILLIPS 4-40 x 0.25 LK STP
3	0.10	RL	E06175	LBL 4.O x 6.0 TTR II W/TEMP PERM
4	0.00		T42195	FIXTURE, ASSY, CHASSIS 3400
5	0.00		T42201	FIXTURE, ASSY, ROLLER ALIGNMENT, 3400
6	0.00		T42209	FIXTURE, ASSY, HUB ALIGNMENT, 3400
7	0.015	RL	E06144	LBL 4.O x 6.0 WHITE/THERMAL LIGHTNING PERM
8	0.10	RL	051864	RIBBON TTR, SMEAR RESIST. 4.l"H x 6000"
9	1		055676	GASKET, RS232 CONNECTOR
10	1		057606	BAR, TEAR, 4400
11	3		058776-004	LIGHT PIPE, DOCK/CHARGER
12	1		058996-007	ROLLER, PLATEN
13	1		058997-004	ROLLER, DRIVE
14	1		059003-001	PRINTHEAD, 4.09 IN, 5MIL, 3400
15	1		059008-007	PLATE, BASE
16	1		059009-007	COVER, MEDIA ACCESS
17	1		059010-006	BEZEL, FRONT COVER
18	1		059011-007	COVER, REAR
19	1		059012-007	PLATE, FRONT COVER
20	1		059013-002	LENS, MEDIA INSPECTION
21	1		059014-001	LABEL, LOADING INSTRUCTIONS
22	1		059017-001	CABLE ASSY, RIBBON, PRINTHEAD
23	1		059019-008	HEATSINK, PCB DRIVERS
24	1		059020-014	PLATE, MAIN DECK
25	1		059021-001	CABLE ASSY, MAIN MOTOR STEPPER
26	1		059022-006	BRACKET, MEDIA PATH, UPPER
27	1		059023-005	BRACKET, MEDIA PATH, LOWER
28	1		059024-006	PLATE, MOTOR
29	4		059025-003	EXTRUSION, PRINTED SPAN
30	1		059026-006	PLATE, LOWER MODULE, OUTBOARD
31	1		059028-006	GEAR, PLATEN, D SHAFT, 96-TOOTH
32	1		059029-005	BAR, STRIP SUPPORT
33	1		059030-004	EDGEGUIDE, OUTER
34	1		059032-002	BRACKET, PRINTHEAD PIVOT
35	1		059035-007	PLATE, UPPER MODULE, OUTBOARD
36	1		059037-004	BLOCK, PIVOT
37	1		059038-003	SHAFT, TTR RIBBON
38	1		059039-009	HANDLE, PRINTHEAD PRESSURE
39	1		059040-005	SPRING, TORSION, PRINTHEAD RETURN
41	3		059043-006	HUB ASSY, LINER TAKE-UP
42	1		059044-007	GEAR/PULLEY, CLUSTER, L/H LOCK
43	1		059048-008	PAD, TTR CLUTCH
44	1		059050-005	PCB ASSY, MAIN, 3400

3400 printer assembly item list (Cont.)

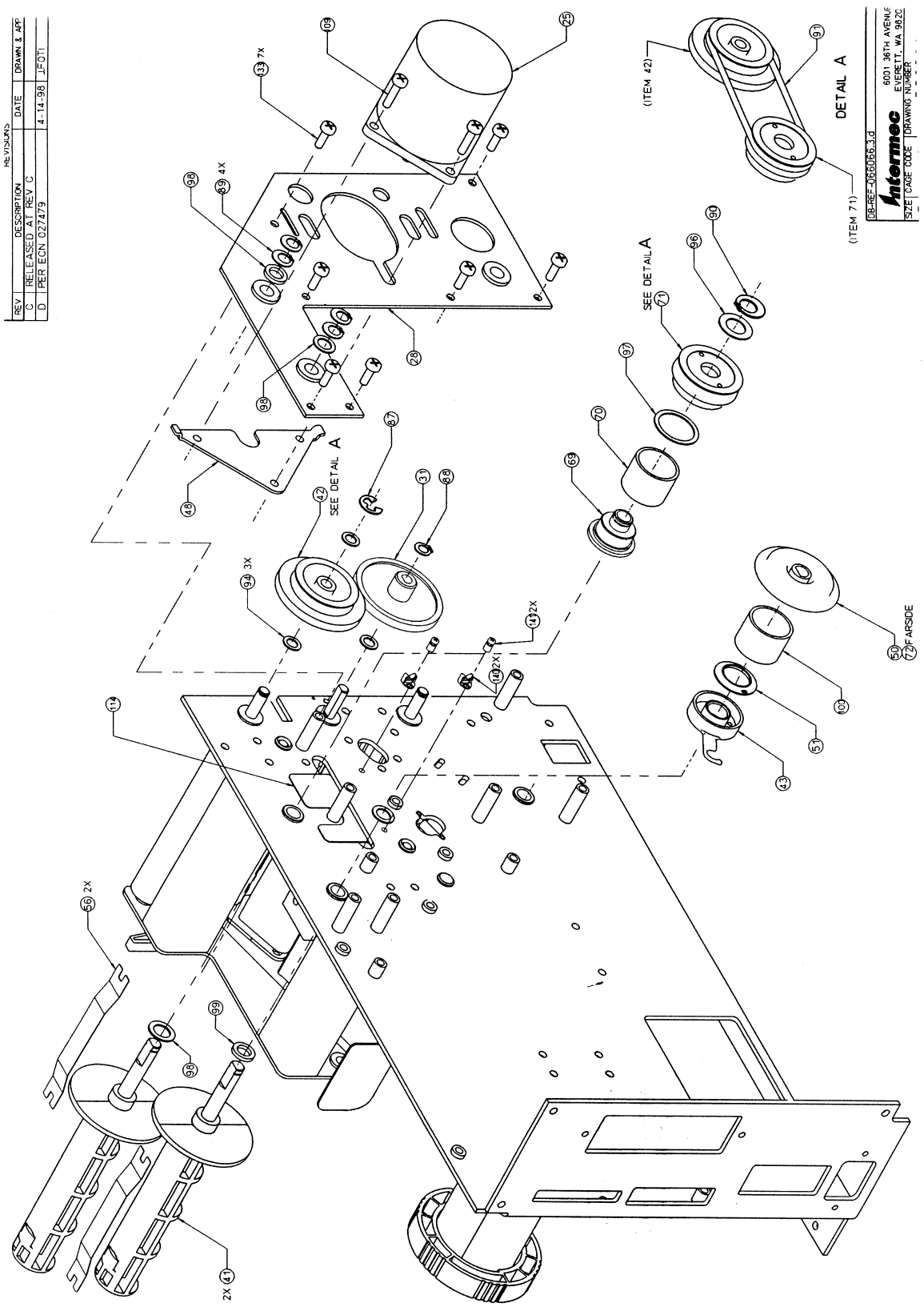
45	1	059052-001	PCB ASSY, BEZEL, 3400
46	1	059100-008	BEZEL, TOP COVER
47	1	059101-007	COVER, ELECTRONICS
48	1	059102-002	BRACKET, MO'IOR MOUNT
49	1	059103-002	BUTTON, CAP
50	1	059114-007	ENCODER, TTR CLUTCH
51	1	059115-005	WASHER, TTR CLUTCH
52	1	059117-005	POST, MEDIA
53	1	059120-002	CAP, MEDIA POST
54	1	059122-001	LEVER, PRINTHEAD ADJUSTMENT
55	1	059124-003	CLAMP, LINER HUB
56	2	059125-003	BRACKET, CORE LOCKING
58	2	059387-003	BRACKET, HINGE
59	1	059423-002	MOUNT, MARK SENSOR
60	1	059454-005	MOUNT, LABEL CAP SENSOR
61	1	059484-002	SPRING, PAPER PATH RETURN
62	1	059495-001	CABLE ASSY, LABEL GAP
63	1	059496-004	CABLE ASSY, LABEL TAKEN
64	1	059508-003	GUARD, SPRING DRIVE
65	1	059509-001	SHAFT, PAPER PATH
66	1	059510-001	ROLLER, LINER DRIVE
67	1	059511-005	GEAR/PULLEY CLUSTER, R/H LOCK
68	1	059654-003	HEATSINK ASSY, LEAFSPRING & PRINTHEAD
69	2	059687-005	COLLET, TAKE-UP CLUTCH
70	2	059688-002	SPRING, TAKE-UP CLUTCH
71	2	059689-006	PULLEY, TAKE-UP CLUTCH
72	1	059708-002	LABEL, ENCODER
73	1	059709-003	CAM ASSY
74	3	059710-001	MAGNET, DOOR LATCH
75	1	059718-002	RING, LBL SUPPLY
76	1	059727-001	CABLE ASSY, BEZEL
77	1	059729-002	CABLE ASSY, LABEL MARK
78	1	059781-001	THUMBSCREW ASSY
80	1	586142	INS. SHIM
81	1	059877-002	FIRMWARE, 3400, 5MIL P/H
84	0.00	060054-001	PROCEDURE, TEST, FINAL SYSTEM, PRINTER
85	4	501272-001	FEET, RUBBER, ADHESIVE BACKED
86	1	505500	SCREW, NY. PHM 4-40 x 0.250
87	6	501401	RETAINING RING 0.250 DIA 8610/20
88	3	501409	RING, RETAINING. 0.250 DIA. BASIC
89	3	501413	RING, RETAINING 0.312 DIA. BASIC
90	2	501461-001	RING, RETAINING, EXTERNAL, 0.395 ID

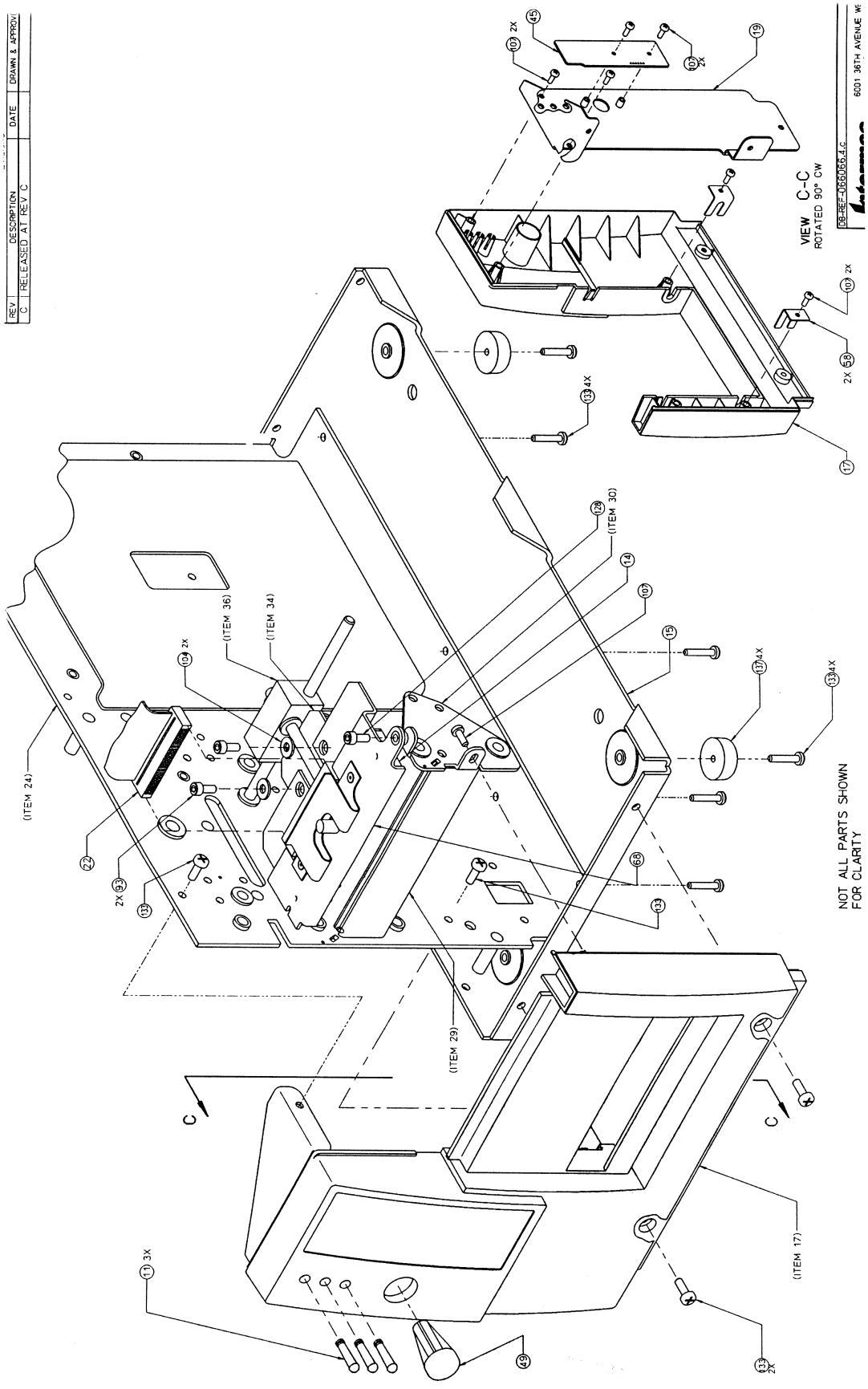
3400 printer assembly item list (Cont.)

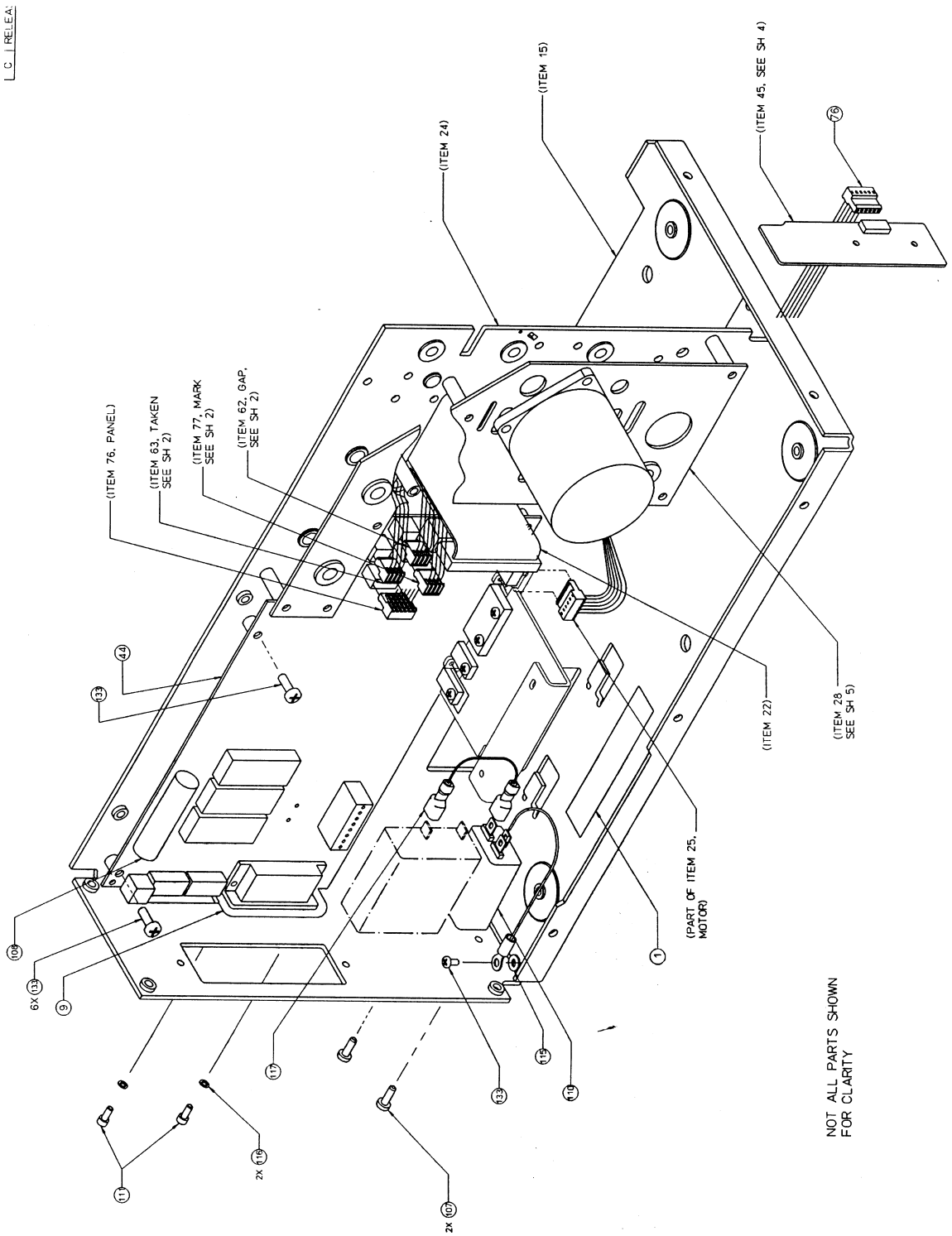
91	2	501462-002	O-RING, 2.950 ID x 0.139 THK
93	2	505613	SCREW, SOC. HD. CAP 8-32 x 0.375
94	9	506013	WASHER, SST, 0.255 ID x 0.407 OD x 0.030T
95	1	506905	WASHER, INSUL. NY, 0.194/0.500/0.062
96	1	506040-007	WASHER, FLAT, SST, 0.447 x 0.880 x 0.030
97	2	506040-004	WASHER, FLAT, SST, 0.817 x l.00 x 0.030
98	3	506040-005	WASHER, FLAT, SST, 0.327 x 0.500 x 0.030
99	3	506040-006	WASHER, FLAT, SST, 0.327 x 0.500 x 0.080
100	1	506816-002	SPRING, CPRSN, TTR CLUTCH
101	1	060222-001	SPRING, PRINTHEAD LOCATION
102	1	507717	FASTENER, COTTER PIN, 0.25 SHAFT
103	2	521011	RIVET, POP ALUM., 0.094DIA x 0.375
104	2	521118-001	WASHER, SPRING, CONL, 0.175 x 0.500 x 0.07H
105	0.016 RL	521528-001	TAPE, TRANSFER, ADHESIVE, 0.010 THK, CLR
106	61	522690	SCREW, THD ROLL W/CONE, 8-32 x 0.38
107	9	526036	SCREW, PHP, W/INT. STAR, 6-32 x 0.375
108	1	586229	BATTERY, LITHIUM, 3.6V, 1.75AH
109	3	507639	SCREW, PHP. W/INT. STAR, 8-32 x 0.500
110	1	060246-001	FILTER ASSY, LINE AC, 3400
111	2	507659-001	SCREW, JACK, 4-40 x 0.312
112	1	060259-001	DOOR ASSY, ACCESS
113	2	501394-001	MOUNT, WIRE ROUTING, ADH BACK
114	1	060214-001	FLAP, PRINTHEAD CABLE RESTRAINING
115	1	506103	WASHER LOCK, EXT. STAR, NO. 8
116	2	506111	WASHER LOCK, SPLIT, NO. 4 M.S
117	1	041776	JUMPER ASSY, 0.25 TERMINAL LUGS, 4-IN.
118	2	060315-001	ROLLER, PINCH
119	1	060316-001	SHAFT, PINCH ROLLER
120	2	501445	RING, RETAINING, 0.125 DIA., E-RING, ZINC
121	1	060317-001	PAD, SOUND DAMPENING
123	0.00	T42440	FIXTURE ASSY., 3400 CLUTCH HOLDER
124	0.00	T42439	FIXTURE ASSY., 3400 WASHER HOLDER
125	0.00	MS059131	METHOD SHEET 3400 PRINTER
126	0.00	T42374-002	FIXTURE ASSY., PRINTHEAD ALIGNMENT
127	0.00	524033	APPLICATOR, RETAINING RING, 0.120
128	1	505767	SCREW, PHM, 8-32X 0.375

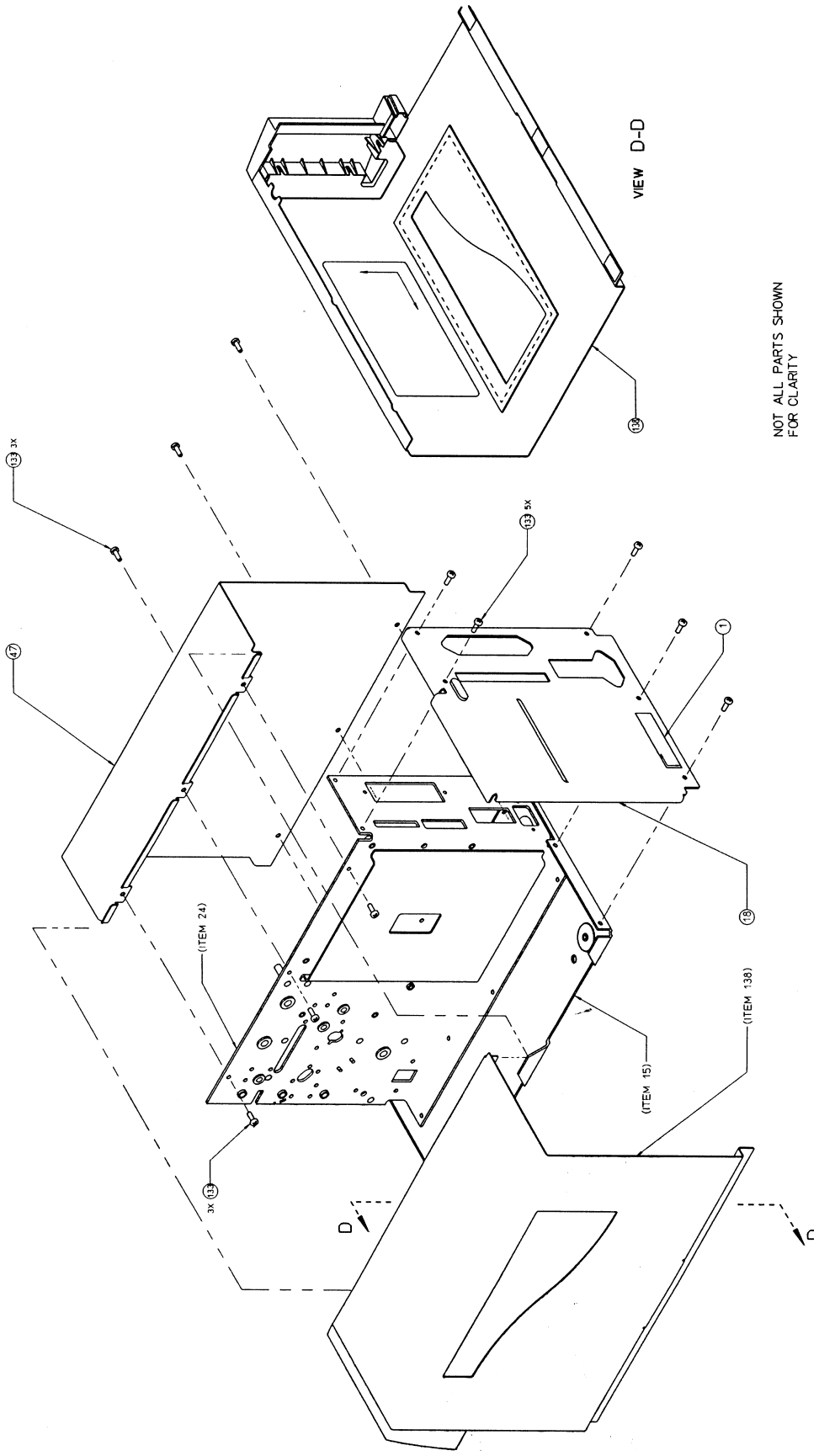


3400C - Printer Assembly


REVISIONS
REV | DESCRIPTION | DATE | DRAWN & APP
C | RELEASED AT REV C | 4-14-98 | JFOTI
D | PER ECN 027479
DETAIL A
SEE DETAIL A
(ITEM 42)
(ITEM 71)
intermec
6001 36TH AVENUE
EVERETT, WA 9820
SIZE | CAGE CODE | DRAWING NUMBER
DB-REF-056066.3.d
FARSIDE


REV
DESCRIPTION
DATE
DRAWN & APPROV
C
RELEASED AT REV C
VIEW C-C
ROTATED 90° CW
NOT ALL PARTS SHOWN
FOR CLARITY
(ITEM 24)
(ITEM 36)
(ITEM 34)
(ITEM 30)
(ITEM 29)
(ITEM 17)
2X
3X
4X


(ITEM 24)
(ITEM 15)
(ITEM 45, SEE SH 4)
(ITEM 76, PANEL)
(ITEM 63, TAKEN SEE SH 2)
(ITEM 77, MARK SEE SH 2)
(ITEM 62, GAP, SEE SH 2)
(ITEM 22)
(ITEM 28 SEE SH 5)
(PART OF ITEM 25, MOTOR)
6X (13)
2X (19)
2X (107)
NOT ALL PARTS SHOWN FOR CLARITY


VIEW D-D
NOT ALL PARTS SHOWN FOR CLARITY
(13) 3X
(13) 5X
(47)
(1)
(18)
(ITEM 24)
(ITEM 138)
(ITEM 15)
3X (13)
D
C

3400C Printer Assembly Item List

9	1	060544-001	GASKET, RS232 CONNECTOR
10	1	057606	BAR, TEAR, 5.3 inch
11	3	058776-004	LIGHT PIPE, DOCK/CHARGER
12	1	058996-009	ROLLER, PLATEN
13	1	058997-005	ROLLER, DRIVE
14	1	059003-001	PRINTHEAD, 4.09 IN, 5MIL, 3400
15	1	059008-009	PLATE, BASE
17	1	059010-006	BEZEL, FRONT COVER
18	1	059011-010	COVER, REAR
19	1	059012-009	PLATE, FRONT COVER
22	1	061548-001	CABLE ASSY, RIBBON, PRINTHEAD
24	1	063837-002	PLATE, MAIN DECK
25	1	059021-002	CABLE ASSY, MAIN MOTOR STEPPER
26	1	059022-006	BRACKET, MEDIA PATH, UPPER
27	1	059023-006	BRACKET, MEDIA PATH, LOWER
28	1	059024-009	PLATE, MOTOR
29	4	059025-003	EXTRUSION, PRINTED SPAN
30	1	059026-007	PLATE, LOWER MODULE, OUTBOARD
31	1	059028-007	GEAR, PLATEN, D SHAFT, 96-TOOTH
32	1	059029-006	BAR, STRIP SUPPORT
33	1	059030-005	EDGEGUIDE, OUTER
34	1	059032-002	BRACKET, PRINTHEAD PIVOT
35	1	059037-005	BLOCK, PIVOT
36	1	062476-004	PLATE, UPPER MODULE, OUTBOARD
37	1	059038-003	SHAFT, TTR RIBBON
38	1	059039-012	HANDLE, PRINTHEAD PRESSURE
39	1	059040-006	SPRING, TORSION, PRINTHEAD RETURN
41	2	061513-003	HUB, RIBBON DRIVE
42	1	059044-007	GEAR/PULLEY, CLUSTER, L/H LOCK
43	1	059048-009	PAD, TTR CLUTCH
44	1	066070-005	PCB ASSY, MAIN, 3400C
45	1	059052-002	PCB ASSY, BEZEL, 3400
47	1	059101-009	COVER, ELECTRONICS
48	1	059102-002	BRACKET, MO'IOR MOUNT
49	1	059103-002	BUTTON, CAP
50	1	059114-007	ENCODER, TTR CLUTCH
51	1	059115-005	WASHER, TTR CLUTCH
52	1	059117-005	POST, MEDIA
53	1	059120-002	CAP, MEDIA POST
54	1	059122-001	LEVER, PRINTHEAD ADJUSTMENT
56	2	059125-005	BRACKET, CORE LOCKING
58	2	059387-003	BRACKET, HINGE
61	1	059484-003	SPRING, PAPER PATH RETURN
62	1	059495-002	CABLE ASSY, LABEL GAP

3400C printer assembly item list (Cont.)

65	1	059509-002	SHAFT, PAPER PATH
68	1	059654-003	HEATSINK ASSY, LEAFSPRING & PRINTHEAD
69	2	059687-005	COLLET, TAKE-UP CLUTCH
70	2	059688-004	SPRING, TAKE-UP CLUTCH
71	2	059689-006	PULLEY, TAKE-UP CLUTCH
72	1	059708-003	LABEL, ENCODER
73	1	062614-001	CAM ASSY, PRESSURE
75	1	059718-002	RING, LBL SUPPLY
76	1	059727-001	CABLE ASSY, BEZEL
77	1	059729-003	CABLE ASSY, LABEL MARK
78	1	059781-001	THUMBSCREW ASSY
87	3	501401	RETAINING RING 0.250 DIA 8610/20
88	3	501409	RING, RETAINING. 0.250 DIA. BASIC
89	4	501410	RING, RETAINING 0.310 DIA. GRIPPING
90	1	501461-001	RING, RETAINING, EXTERNAL, 0.395 ID
91	1	501462-002	O-RING, 2.950 ID x 0.139 THK
93	2	505613	SCREW, SOC. HD. CAP 8-32 x 0.375
94	5	506013	WASHER, SST, 0.255 ID x 0.407 OD x 0.030T
96	1	506040-007	WASHER, FLAT, SST, 0.447 x 0.880 x 0.030
97	1	506040-004	WASHER, FLAT, SST, 0.817 x l.00 x 0.030
98	3	506040-005	WASHER, FLAT, SST, 0.327 x 0.500 x 0.030
99	1	506040-006	WASHER, FLAT, SST, 0.327 x 0.500 x 0.080
100	1	506816-002	SPRING, CPRSN, TTR CLUTCH
101	1	506827-001	SPRING, PRINTHEAD LOCATION
102	1	507717	FASTENER, COTTER PIN, 0.25 SHAFT
104	3	521118-001	WASHER, SPRING, CONL, 0.175 x 0.500 x 0.07H
106	10	522690	SCREW, THD ROLL W/CONE, 8-32 x 0.38
107	11	526036	SCREW, PHP, W/INT. STAR, 6-32 x 0.375
108	1	586229	BATTERY, LITHIUM, 3.6V, 1.75AH
109	3	507639	SCREW, PHP. W/INT. STAR, 8-32 x 0.500
110	1	060246-002	FILTER ASSY, LINE AC, 3400
111	2	507659-001	SCREW, JACK, 4-40 x 0.312
114	1	060214-002	FLAP, PRINTHEAD CABLE RESTRAINING
115	1	506103	WASHER LOCK, EXT. STAR, NO. 8
116	2	506111	WASHER LOCK, SPLIT, NO. 4 M.S
117	1	041776	JUMPER ASSY, 0.25 TERMINAL LUGS, 4-IN.
127	0.00	524033	APPLICATOR, RETAINING RING, 0.120
128	1	505767	SCREW, PHM, 8-32X 0.375
132	1	064030-001	PLATE, MEDIA
133	41	505321	SCREW, W/CONE WASH., 8-32 X 0.375L
135	1	066368-002	BRACKET, HEATSINK, MAIN PCB
136	16	525034-001	SCREW, THD ROLL W/CONE, 8-32 X 0.50
137	4	523308	BUMPER, RUBBER W/WASH
138	1	066823-001	COV, MEDIA ASSY, 34XX
145	1	501394-001	MOUNT, WIRE ROUTING, ADH BACK

3400A Firmware Notes

Fixes in version 1.9:

1 - Disable self-strip and TTR mode in Test and Service.

2 - UCC128 modulo 10 check digit was not appended to interpretive text.

3 - Output the mark sensor value for Test and Service mode.

Fixes in version 1.8:

1 - Incorrect inter-character spacing values sent when font is uploaded from the printer. Fixed.

2 - Printer lockup when format is uploaded that has code 39 prefixes. Fixed.

3 - A robust ram clear was added that will clear memory when the skip button is pressed and the switches are set for Test and Service memory clear.

4 - Disable TTR mode in test and service.

5 - Lockup if inc/dec used with batch and quantity commands. Fixed so that print abort and batch/quantity work together.

6 - Autotransmit 3 <SOH> is not sent when image bands > label length. Redesigned to work.

7 - Postnet always prints s/s characters and check digit, even when the symbol is blank. Fixed.

8 - Font 25 doesn't print as large as requested when using points and height/width. Fixed.

9 - Power has to be cycled after using the parallel, twinax and coax options to get the serial I/O to work. Fixed to allow the serial port to work without having to disconnect the option interface card.

10 - <ENQ>'s and empty messages fill up the buffer in multi-drop. Fixed so printer sends a <DC3> to host before <NAK>'ing messages.

11 - If autotransmit 3 and label fault occurs, then no <SOH> is sent when print complete and buffer empty. Fixed.

12 - Lockup when reset command seen in multi-drop. LED blinks forever. Fixed.

13 - Printer powers up in mulit-drop network but protocol is set for standard. If switches are set for 'Intermec' protocols and switch 7 is on, then force protocol to multi-drop else allow auto-discrimination of protocol.

14 - Multi-drop network halted if printer is powered up using address 'A'. Fixed.

Fixes in version 1.7:

1 - Pin 11/20 on the RS-232C port does not go 'ready' on power-up or reset when using Xon/Xoff.

2 - White bands appear on the label or invalid barcode data is printed. This happens when using the parallel option card and sending data while the printer is printing.

3 - Printer lockup if EAN 13 and supplementals are used with slave fields.

4 - The autotransmit 3 status <SOH> is not sent when printing is done and buffer is empty.

Fixes in version 1.6: (v1.6 was not released, changes were added to v1.7)

1 - Printer does not recover from a paper fault during batch printing.

2 - An extra label is printed if printing is aborted with quantity and batch set.

3 - If 'image only changed fields' is used and a print abort occurs, the last labels printed have data from 3 different labels on them.

4 - Intermittent double retract problem.

5 - I 2 or 5 barcode numeric pair 50 has incorrect spacing at 2.5 to 1 ratio.

6 - Printer locks up when using the Swiss character set.

7 - The immediate command <ESC>Q is buffered up and when the buffer gets full, the printer continues to respond but will not execute commands (locks up).

8 - Printer does not default to format 0 as described in the manual when changing between emulation and non emulation modes.

Fixes in version 1.5.4: (v1.5.4 was not released, changes were added to v1.7)

1 - Loss of data in Xon/Xoff protocol.

2 - Code 128 doen't encode spaces.

3 - Top of form registration varies up to 0.1 inch when label retract is used.

4 - Feeds continuous blank labels if printing a label batch and recovering from a label fault.

5 - Feeds blank labels when recovering from a low stock if the reimage only variable fields command is used when accessing a format (<ESC>En,1).

6 - Printer locks up when data is sent to a fixed data format.

3400A Firmware Notes (Cont.)

Enhancements in version 1.5:

1 - Throughput enhancement with “image before print” and re-image only changed fields.

2 - Added Swiss/Switzerland to international character sets. Selected with <STX><SI>l9 <ETX>(see ‘set language’ command). This is a blend of English, French and German characters.

3 - User selectable gap feature for fonts. This is for the Font Select command <STX>cn,m<ETX>.

4 - Spaces and brackets can now be included in UPC-EAN 128, but not in the barcode (digits only).

5- Added two more fonts for printing UPC symbol interpretives.

6- Modified UPC barcode interpretive characters to enhance their appearance.

7- Improved mono-spaced outline fonts in 180° direction.

8- Broadened Font 22 (20 point) to include all characters in the expanded ASCII chart (81 to FF).

9- Added check for minimum image bands, with an update to the configuration table to the actual number of bands allocated.

10- Allow asterisk ‘*’ to be used to select global field name. For example, select field with ‘*’ and send data to all the fields with that name.

11- JIS-ITF barcode with box and interpretive printing added.

12- HIBC Code 128 added.

13- Modified the upload format feature to use L39 instead of L1 as the default. L39;D0;...

14- Changed the User Defined Interface table for Timeout on EOM ACK from 15 to 20.

Fixes in version 1.5:

1 - Added second expanded RAM check because of Toshiba SRAM chips.

2 - The label sometimes would not be reprinted after a label fault was detected during printing.

3 - The label could be reprinted twice after a label fault was detected during printing.

4 - An <ESC>M command generated an error code 34 (illegal escape command) when using Xon/Xoff protocol.

5 - Fixed problem with Codabar start/stop codes.

6 - Fixed the space and non-printable character registration problem that affected many fonts.

7 - Fixed a problem in which auto-discrimination of protocols would not work.

8 - The downloading of outline fonts has been fixed.

9 - Fixed a problem where sending a <ENQ> or <VT> command as the first character in Xon/Xoff protocol caused the printer to disregard all printable control characters thereafter.

10 - Fixed a problem that caused the formatted interpretive text of Code 128, Serial Shipping Container Code or UCC/EAN-128 to be overwritten.

Technical Tips

NUMBER: 352 DATE: 11/11/94 REVISION: (-) PAGE: 1 OF 4

SUBJECT: Program Release **version 1.4** for the **3400A**.

PRODUCTS AFFECTED: 3400A

SYMPTOM: **FN 497:** Not able to adjust label out to cut or tear position using End of Print Skip Distance command.

PROBLEM: End of Print Skip Distance command <SI>Dnnnn has no effect when using die cut stock.

SOLUTION: Corrected in **version 1.4**

SYMPTOM: The printer does not print the entire label.

PROBLEM: Printer may not detect image rate error.

SOLUTION: Corrected in **version 1.4**

SYMPTOM: Ribbon breaking in Test and Service.

PROBLEM: Burn through.

SOLUTION: Corrected in **version 1.4**

ENHANCEMENTS:

1. Added the following adjustments via Test and Service using DIP switches.

   A. X forms adjust: Default = 00 Range = -30 to 30.
   B. Y forms adjust: Default = 00 Range = 0 to 30.
   C. Label Rest Point. Default = 00 Range = -30 to 30.

NOTE: The Label Rest Point adjustment performs the same function as the on-line configuration command <SI>f[n]. This command adjusts the point at which labels are presented for removal.

2. Added Emulation Selections via Test and Service using DIP switches.
   A. Advanced Mode.
   B. 10 Mil.86XX Emulation Mode
   C. 15 Mil.86XX Emulation Mode

NOTE: The Test and Service Emulation settings perform the same function as the on-line configuration command <SI>C[n]. This command selects which mode the printer will power up in; 86XX Emulation or Advanced Mode.

3. Added the ability to take the printer off-line by double clicking the Feed/Pause button. If the printer is printing, this function is ignored.

4. Changed boundaries on the following configuration commands:

   A. Top of Form: **From:** 2 to 4000 **To:** -10 to 4000.
   B. Label Rest Point: **From:** -20 to 20 **To:** -30 to 30.

Version 1.4 firmware for the 3400 provides the means to "fine adjust" two areas of a label:

1. The label's leading edge (XY coordinate 00), ie: start point of the printed image.
2. The final rest position of the printed label with respect to the tear bar (Retract enabled).

Functional Description XY Adjust:

The X direction is the direction of paper motion. The X default location is approximately 0.2 inches from the leading edge of the label. With the Top of Form set to it's minimum value 0.010 inch using the configuration command (<SI>F2), setting X "backward" to -20 will place the image very close to the leading edge of the label. The exact location may vary from printer to printer due to mechanical tolerances.

The Y direction is perpendicular to the paper motion. The default value is 0.050 inch as referenced from the innermost paper guide.

NOTE: Both the X and Y adjustments are done in 0.005 mil increments. This value does not change for printers operated in the 10 mil or 15 mil mode.

The X and Y parameters, Emulation Selection and Label Rest Point are set from Test and Service mode by the DIP switches on the rear of the printer. Their values are stored in non-volatile memory and are retained until changed again..

ADJUSTMENT PROCEDURE:

Changing The X and Y Settings In Test and Service.

1. With all DIP switches turned off, power up the 3400 while depressing the Feed/Pause key.
2. Once labels begin moving, release the Feed/Pause key. The hardware configuration label will print.
3. Set the Top Bank of DIP switches 1, 2, 3, and 4 to ON for X Forms Adjust. Switch 5 sets the direction the form (label) is adjusted. OFF to move the form forward, ON to move it backward.

NOTE: Moving the form forward moves the printed image further away from the leading edge and moving the form backward moves the printed image closer to the leading edge. Set switch 5 ON for this example. Reference TABLE II for description of switches.

4. Set the Bottom Bank of DIP switches for the number of dot increments you want to move. Use the binary weights in TABLE I to select the number of dot increments.

For Example: To move the printing forward 10 dot increments (0.050 inch), Set the Bottom Bank switches 2 and 4 to the ON position..

5. Push and release the Feed/Pause button to save this value. The 3400 will print the software configuration with the new X Forms Adjust value of -10.

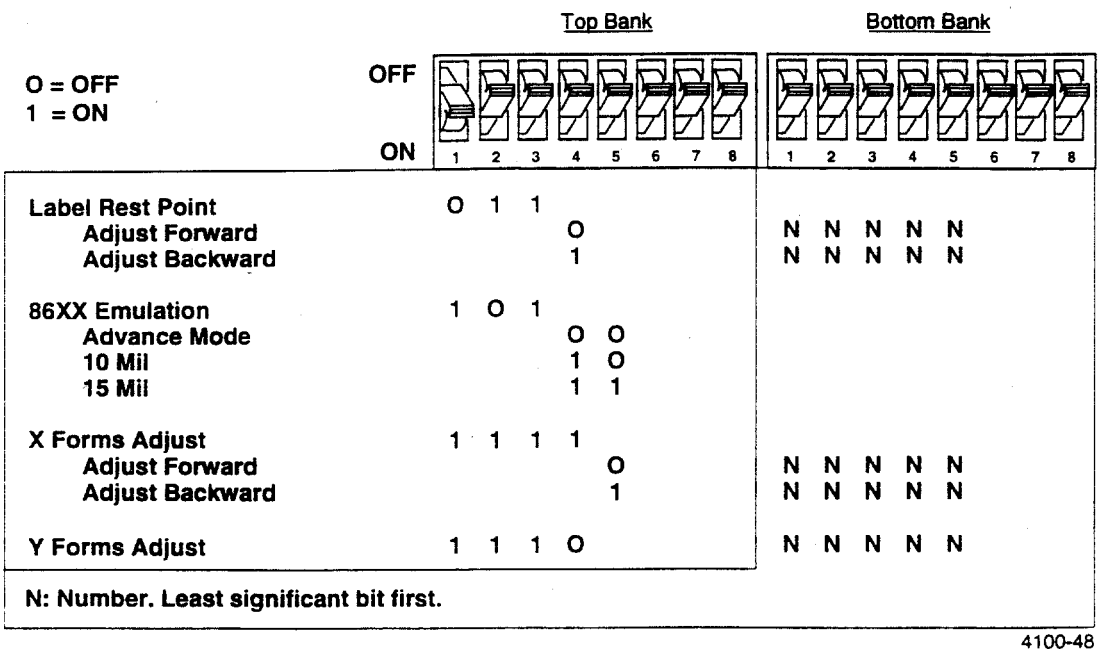
To set Label Rest Point or Emulation, follow steps 1 through 5 setting the switches according to TABLE II.

TABLE I:

Bottom Bank DIP switch number and binary weight:

Sw 1 = 1 Sw 2 = 2 Sw 3 = 4 Sw 4 = 8 Sw 5 = 16 Sw 6, 7, 8 = not used.

TABLE II



	Top Bank								Bottom Bank							
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
Label Rest Point	O	1	1													
Adjust Forward				O					N	N	N	N	N			
Adjust Backward				1					N	N	N	N	N			
86XX Emulation	1	O	1													
Advance Mode				O	O											
10 Mil				1	O											
15 Mil				1	1											
X Forms Adjust	1	1	1	1												
Adjust Forward					O				N	N	N	N	N			
Adjust Backward					1				N	N	N	N	N			
Y Forms Adjust	1	1	1	O					N	N	N	N	N			

N: Number. Least significant bit first.

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3400A Firmware Notes (Cont.)

Enhancements in version 1.3:

1 - Improved UPC/EAN barcode interpretive printing.

2 - Improved registration on small label stock.

3 - Added code 128 HIBC.

Fixes in version 1.3:

1 - Codabar, printer enters check digit, doesn't work.

2 - Printer has poor label registration.

3 - When printing UPC-A barcodes in any rotation, the interpretive field is too close to the barcode.

4 - Printing UPC-A barcode at 90° or 270° rotation, the bars extend into the interpretive field.

5 - UPC/EAN barcode interpretive field prints too close to the barcode.

Enhancements in version 1.2:

1 - The outline font (c25) is available when expanded static RAM is installed.

2 - Holding the FEED/PAUSE button down while the printer has a media fault (label or ribbon), causes the printer to continuously attempt a reload and CANELS any pending print job.

3 - Lines were added to the hardware configuration label for a print head alignment check.

4 - The default sensitivity value for TTR is changed from 563 to 567.

5 - Sensitivity number 396 was added for alternative premium ribbons.

Fixes in version 1.2:

1 - 3400 doesn't print user-defined outline fonts.

2 - Changing User Defined Interface command table 0 causes the printer to lock up.

3 - <SI>i command doesn't exit in the 3400.

4 - Printer won't print fonts in test and service.mode.

5 - The command <ESC>m doesn't clear memory after using the <SI>N command.

6 - UDCs are not uploaded correctly.

7 - Test and service mode UDC selective transfer didn't work.

8 - Printer may do 2 feeds of a label for 1 push of the FEED button.

9 - The wrong default sensitivity setting on TTR selection.

3400A Firmware Notes (Cont.)

Fixes in version 1.2 (Cont.):

10 - Human-readable border doesn't adjust to 86xx emulation.
11 - UPC barcode interpretives are not correctly aligned with the barcode.
12 - Mark label stock retracting when form feeding.
13 - Printer returns a error status of ":1" after a font test.
14 - <LF> is hard coded in the User Defined Interface command table.
15 - Address A in multi-drop is acting like polling mode D.
16 - No paper feed error when using continuous label stock.
17 - 3400 prints the outline font c25 at 1/2 the size of the 4400 printer.
18 - The printer sets incorrect defaults for font selection.
19 - Printer has inconsistent defaults for UPC/EAN barcodes.
20 - Printer has incorrect default for UDCs.
21 - <ESC>v30 does not return an error code of 27 after sending a <BEL> to the printer.
22 - Printer assigns incorrect defaults to POSTNET barcode.
23 - Retract range 0 to 399, with the default of 0. The user manual says range is 0-99, default 284.
24 - Invalid parameters to T command result in an error 12 (data count exceeded).

Enhancements in version 1.1:

1 - Blink Alert LED on power up to make sure it works.
2 - Added IBM translation table to support Twinax/Coax host.
3 - Support a wider range of media sensitivity values.

Fixes in version 1.1:

1 - The <ESC>C and <ESC>c commands do not default to format 0.
2 - The printer may not upload UDCs correctly.
3 - CODABAR may not use the correct start/stop characters.
4 - Printer has incorrect defaults for I 2 or 5 barcode.
5 - Editing HIBC barcodes can cause other bar code fields to be deleted.
6 - 3400 uploads an incorrect number of digits for the height of barcodes.
7 - Entering a box width before legth/height can result in incorrect width.
8 - Printer may report a Z value of less than 0 (range is 1 to 599).

3400A Firmware Notes (Cont.)

Fixes in version 1.1 (Cont.):

9 - Printer ignores all program mode commands after the user downloads font 7.

10 - Printer does not upload I 2 of 5 barcode correctly.

11 - The border around human-readable fields does not adjust for 86xx mode.

12 - The 3400 should have the new and improved Ms and Ws.

13 - The last block uploaded in a font upload is <STX><CR><LF><ETX>.

14 - The <SI>g command (TTR or DT select) should override the switch setting to be consistent with the 4100.

15 - Save edit command (N) doesn't save fonts or UDCs.

16 - The <ESC>x command does not upload all information for border width b[n].

17 - The wrong error code for "Format number out of range" error.

18 - The upload format information <ESC>x[n] command does not have all it's digits.

19 - Wrong default sensitivity setting on TTR selection.

20 - Printer doesn't have consistent defaults for C command.

21 - <LF> is hard coded in the User Defined Interface command tables.

The 3400B Printer

Introducing the 3400B Direct Thermal and Thermal Transfer Printer!

The new 3400B builds upon the performance, reliability and market success of the 3400. The 3400B was developed to support 2D Symbologies, Japanese character sets and to provide other performance enhancements over the 3400A. Details of these enhancements are reviewed in this document.

Key Differences Between 3400A and 3400B Models.

The 3400B takes the base features of the 3400A and adds the following;

3400A +

Standard Features
- 2D Symbology Support
- Memory Expansion to 128K NVRAM
- Up to 15% Faster Imaging
- Outline Fonts
- Additional Bitmapped Fonts (12 additional point sizes)

Optional Features
- Bitmapped Kanji/Katakana
- Outline & Bitmapped Kanji/Katakana

=**3400B**

3400B Printer Highlights: Features & Benefits

Features and benefits of the 3400B are summarized below. The 3400B is recommended over the 3400A if any of these features are required by the customer for label printing applications.

=> **2D Symbology Support (Code 1, PDF 417 and Maxicode)**

Benefit. Whether customers are implementing 2D now or are g of doing so in the future, the 3400B delivers the technology today.

=> **128K memory**

Benefit. Plenty of memory to support 2D symbologies as well as store more formats, fonts and graphics.

=> **Fast Imaging**

Benefit: Enhanced processing and more memory delivers up to 15% increase in downloading and imaging speed (time to finished label) over the 3400A. Note: specific performance improvement is dependent upon the customer's label format complexity (i.e., the number of variable data fields per label, etc.).

=> **Vector /Outline Font Support**

Benefit: More rounded, smoother fonts for those customers concerned about font and image quality.

=> **Expanded Bitmapped Font Capabilities**

Benefit: Twelve (12) additional point sizes offer customers greater imaging speed and flexibility with a range of 4 points to 36 points.

=> **Optional Kanji/Katakana Character Support**

The 3400B offers two Kanji/Katakana options: 1) Bitmapped, 2) Outline and Bitmapped.

Benefit: Customers shipping finished materials or work in process materials to Japan can meet Japanese label requirements for Kanji/Katakana (Japanese Industrial Standard, Interleaved 2 of 5).

Questions & Answers

- **Is the 3400B replacing the 3400?**

  No. Both the 3400A and 3400B will be part of Intermec's Label Printing Systems.
- **Is the 3400B list price different than the 3400A?**

  Yes. The U.S. list price of the 3400B is $1,995.
- **Can 3400A's be upgraded to gain 2D capability?**

  No. Customers requiring 2D capability will need to purchase the 3400B**.**
- **Is the 3400B faster thin the 3400A?**

  Like the 3400A, the 3400B prints labels from 2 - 5 ips. However, because of the additional memory available in the 3400B (required for 2D), customers may experience up to 15% increase in downloading and label imaging speed.
- **Can I order the 3400B with only 32K of memory?**

  No. The 3400B is only available with 128K as a standard feature.
- **Does the 3400B offer a batch take-up feature?**

  Yes. *Both the 3400A and 3400B offer an internal batch take-up option***.** The internal batch take-up employs the same rewind mechanism used by the liner take up. The batch take-up option includes a wide spool that fits over the liner take up mechanism and a metal plate that fits over the front panel to smoothly guide the printed labels to the take-up spool
- **What is the label capacity of the internal batch take up adapter for the 3400A/B?**

  The internal batch take up option accepts an average of 1/3 of a roll of label stock, which equates to approximately 2000 inches (400, 6" labels. The capacity of the internal batch takeup adapter varies for each application based upon label stock thickness.
- **Does the APAX external batch rewinder work with the 3400B?**

  Yes. The APAX external reminder (available in the BOO catalog) works with both the 3400A and 3400B.
- **Does the 3400B include a vector/outline font with its 128K standard memory?**

  Yes. The vector/outline font (c25) comes standard with the 3400B. This is the same font that is included with the additional memory option for the 3400A.
- **How can a customer have Ethernet connectivity for the 3400B?**

  Ethernet connectivity (Novell NetWare and TCP/IP) for both the 3400A and 3400B is available through an external adapter manufactured by Extended Systems. This product is available through the BOO catalog. *Important Note*: The customer must purchase the parallel I/O Connectivity option on the 3400A or 3400B in order to use the Extended Systems product.

- **How does the 3400B compare to the 3400A and 4100?**

  Each printer offers unique capabilities and features that address the different application needs of customers.

	3400A	3400B	4100
U.S. List Price (base unit)	$1,795	$1,995 (115V & 230V) $2,290 (100V)	$2,495
Maximum print speed	5 ips	5 ips	8.5 ips
Relative Time to First Label Out	Fast	Faster	Fastest
Standard memory	32K NVRAM	128K NVRAM	40K SRAM
Optional memory expansion	Yes: To 128K NVRAM	Not Available	Yes: to 256K SRAM
Outline Font	Yes. With Optional Memory	Yes. Standard	Yes. With Optional Memory
2D Symbology plus 12 additional font sizes	No	Yes	Yes. With Optional memory
Optional Bitmapped Kanji/Katakana support	No	Yes	No
Optional Outline & Bitmapped Kanji/Katakana support	No	Yes	No
IPL support	Yes	Yes	Yes
Label roll length	6,000 inches	6,000 inches	6,000 inches
Ribbon roll Length	6,000 inches	6,000 inches	12,000 inches
Label Debut included	Yes	Yes (115V/230V) Not with 100V	No
Optional batch take-up adapter	Yes: Internal	Yes: Internal	Yes: External
Optional cutter & tray	Not Available	Not Available	Yes
Optional Ribbon Save feature	Not Available	Not Available	Yes

3400B Ordering Information

Ordering Number	Product Description	Shipping Weight	U.S. List Price
3400B	**Direct Thermal & Thermal Transfer Printer** User's manual included	48 lbs. 21.8 kg.	
	POWER:		
0	115 VAC, U.S.Cord		$1,995
1	230 VAC, U.K.Cord		$1,995
2	230 VAC, European Cord		$1,995
3	100 VAC, U.S. Cord		$2,290
	INTERFACE OPTIONS:		
0	No interface options (Serial connection)		N/C
1	Parallel I/O		$150
2	Coax Adapter		$750
3	Twinax Adapter		$750
	2D & MEMORY:		
1	2D (Code 1, PDF 411 & Maxicode) & 128k NVRAM		N/C
	CHARACTER SET OPTIONS:		
0000	Standard		N/C
0100	Bitmapped Kanji/Katakana (Build to Order for 115/230V)*		To Be Announced
0200	Outline & Bitmapped Kanji/Katakana (Build to Order for 115/230V)*		To Be Announced
	FIELD-INSTALLABLE ACCESSORIES:** ***Does not include installation fee*		
060221	Internal batch take-up adapter	*2 lbs* *0.9 kg.*	$75
056830	Field-installable Parallel I/O	*1 lb* *0.5 kg.*	$198
056835	Field-installable Twinax adapter	*2 lbs* *0.9 kg.*	$1,195
056836	Field-installable Coax adapter	*2 lbs* *0.9 kg.*	$1,195
	MEDALLION SERVICE RATES:		
	Platinum Plus		$305
	Platinum		$270
	Gold		$235
	Silver Plus		$215
	Silver		$180
	Bronze		$145
	RIBBON & LABEL MEDIA: Refer to your Media Product & Pricing Handbook for details and pricing.		

** Build to Order Units may require up to 8 weeks delivery.*

3400B Firmware Notes

Fixes and enhancements in version 1.6:

1 - Data Matrix symbology added.

2 - Cannot encode <GS> in PDF417. Fixed.

3 - PDF417 symbology is not completely printed. Fixed.

4 - TTR and Self-Strip are disabled in Test and Service mode.

5 - In Test and Service mode, the label taken sensor always sends a '1' for sensor value. Fixed.

6 - Mark sensor never sampled in Test and Service mode. Fixed.

7 - UCC128 modulo 10 check digit not appended to interpretive text. Fixed.

Fixes in version 1.5:

All fixes to the 3400A, version 1.8 apply.

1 - Lockup adter downloading a Speedo font. Fixed.

2 - Characters overlap when printed at large sizes. Fixed.

3 - Printer reports a configuration of 'c0' instead of 'c2' when 15 mil emulation is enabled. Fixed.

Fixes in version 1.4:

1 - Pin 11/20 on the RS-232C port does not go 'ready' on power-up or reset when using Xon/Xoff.

2 - White bands appear on the label or invalid barcode data is printed. This happens when using the parallel option card and sending data while the printer is printing.

3 - Printer lockup if EAN 13 and supplementals are used with slave fields.

4 - The autotransmit 3 status <SOH> is not sent when printing is done and buffer is empty.

Fixes in version 1.3:

1 - Loss of data in Xon/Xoff protocol.

2 - Code 128 doen't encode spaces.

3 - Top of form registration varies up to 0.1 inch when label retract is used.

4 - Feeds continuous blank labels if printing a label batch and recovering from a label fault.

5 - Feeds blank labels when recovering from a low stock if the reimage only variable fields command is used when accessing a format (<ESC>En,1).

6 - Printer locks up when data is sent to a fixed data format.

7 - Printer does not recover from a paper fault during batch printing.

8 - An extra label is printed if printing is aborted with quantity and batch set.

9 - If 'image only changed fields' is used and a print abort occurs, the last labels printed have data from 3 different labels on them.

10 - Intermittent double retract problem.

11 - I 2 or 5 barcode numeric pair 50 has incorrect spacing at 2.5 to 1 ratio.

12 - Printer locks up when using the Swiss character set.

13 - The immediate command <ESC>Q is buffered up and when the buffer gets full, the printer continues to respond but will not execute commands (locks up).

14 - Printer does not default to format 0 as described in the manual when changing between emulation and non emulation modes.

15 - Not able to create format ID numbers 12-19.

16 - Pin 11/20 goes ready too soon after reset or on power-up.

17 - Error 36 always returned [after sending <BEL> to printer] when using page command.

18 - PDF 417 symbols do not print on every other label in a batch or quantity.

19 - PDF 417 problem with encodation of control characters embedded in a stream of EXC or NUMERIC data.

20 - PDF 417 problem with encodation of 6 consecutive binary data elements.

21 - PDF 417: If the total codewords generated by data exceeds the number that can be stored in the user-defined number of data columns and maximum data rows, override the user-defined number of data columns and increment that number until all codewords fit.

22 - PDF 417: Enforce the maximum number of each data type;
max EXC = 1850, max NUMERIC = 2710, max BINARY = 1108

23 - Code 1 data corruption. Don't go into group mode if only one member in the group.

24 - Code 1 inconsistent in the maximum data amounts compared to the 4400.

25 - Code 1 problem with encoding <CR>.

26 - Font 50 and 51 have problems when using borders, e.g. characters out of position, incorrect inter-character spacing, borders are overwriting preceding and following characters, extraneous white zones.

27 - Prints blank labels when batch printing with enough image bands allocated to fully image the label.

3400B Firmware Notes (Cont.)

Enhancements in version 1.2:

1 - Throughput enhancement with “image before print” and re-image only changed fields.

2 - Added Swiss/Switzerland to international character sets. Selected with <STX><SO>19 <ETX>. This is a blend of English, French and German characters.

3 - Allow asterisk ‘*’ to be used to select global field name. For example, select field with ‘*’ and send data to all the fields with that name.

4 - JIS-ITF barcode, box and interpretives added.

5 - HIBC Code 128 added.

6 - User selectable gap feature for fonts. This is for the Font Select command <STX>cn,m<ETX>.

7 - Modified the upload format feature to use L39 instead of L1 as the default. L39;D0;...

8 - Spaces and brackets can now be included in UPC-EAN 128, but not in the barcode (digits only).

9 - Two more fonts have been added to UPC barcode interpretive fields.

10 - Improved mono-spaced outline fonts in 180° direction.

11 - Modified UPC barcode interpretive characters to enhance their appearance.

12 - Added 2D barcodes; 1) Code 1, 2) PDF 417, 3) Maxicode.

13 - Added Kanji font.

14 - Added <CR><LF> to upload of outline font. All records used to be on the same line.

Fixes in version 1.2:

1 - Label would not be re-printed if the printer went low stock during printing.

2 - Two labels would sometimes be printed after a low stock condition.

3 - <ESC>M, the program number transmit command, would sometimes cause a 34 error, a illegal escape command, in Xon-Xoff protocol.

4 - Fixed Codabar start/stop problem.

5 - Setting for timeout on EOM ACK was 15 instead of 20.

6 - Font 22 (20 point) was incomplete from 80 to FF hex.

7 - Fixed space and non-printable character registration problem in many fonts.

8 - Auto-discriminate of protocols would not always work.

9 - Downloading of outline fonts would not work.

Enhancements in version 1.2: (Cont.)

10 - Sending a <ENQ> or <VT> as the first character in Xon-Xoff caused the printer to disregard all the following printable control characters.

11 - Formatted interpretive text would sometimes be overwritten.

12 - Selective transfer and cloning didn't work.

13 - UPC E barcode with the host entering the check digit prints incorrect barcode and interpretive.

14 - Printer may not return a <DC1> character when running 19.2K, E, 8, 1, Xon-Xoff with status.

15 - Dropping fields of data.

16 - Memory gets reset after a <BS> reset.

17 - Printer does not recover after a paper fault in batch mode printing.

18 - Printing Postnet locks up the printer.

19 - Printer locks up after setting <SI>N20.

20 - In self-strip mode, with TTR enabled and a label fault occurs, the feed button is ignored.

21 - Printer returns a <CR><DC2> status instead of <DC2:> when running Xon-Xoff with status.

22 - Pin 11 communication is dropping data.

23 - Hardware config. label does not show correct storage and image RAM amounts.

24 - Printer mistakenly reprints UPC interpretive data on next label.

25 - Printer does not flash Empty/Pause LED during cloning.

26 - Printer double images barcodes in the same spot on the label.

27 - Format 0 doesn't print.

28 - Printer may post a 00 error after a image rate error.

29 - DT/TTR should be selected by switches only.

30 - Does not recognize the expansion RAM pcb on power up.

3400A/B Spare Parts List

REF. NO.	DESCRIPTION	3400A DT/TTR PRINTER	3400B DT/TTR PRINTER
1	COVER, ELECTRONICS	059101-009	059101-009
2	BEZEL, TOP COVER	059100-008	059100-008
3	COVER, REAR	059011S-006	059011S-006
4	MAGNET, DOOR LATCH	059710-001	059710-001
5	COVER, MEDIA ACCESS	059009S-007	059009S-007
6	PCB ASSY, BEZEL	059052S-002	059052S-002
7	PLATE, FRONT COVER	059012-009	059012-009
8	BRACKET, HINGE	059387-003	059387-003
9	BEZEL, FRONT COVER	059010S-007	059010S-007
10	ROLLER, PINCH	060315-003	060315-003
11	DOOR, ACCESS	060259-001	060259-001
12	FEET, RUBBER, ADHESIVE	501272-001	501272-001
13	BUTTON, CAP	059103-002	059103-002
14	CABLE ASSY, RIBBON, PRINTHEAD	059017-001	059017-001
15	WASHER, SPRINT, CONL, .175 x .50	521118-001	521118-001
16	SCREW, SOC HD CAP, 8-32	505613	505613
17	PLATE, LOWER MODULE, OUTBOARD	059026-007	059026-007
18	PRINTHEAD, 4.09 INCH 5 MIL.	059003S-001	059003S-001
19	HEATSINK ASSY, LEAFSPR & P/H	059654-003	059654-003
20	CABLE ASSY, BEZEL	059727-001	059727-001
21	CABLE ASSY, LABEL TAKEN SENSOR	059496-004	059496-004
22	CABLE ASSY, LABEL MARK	059729-003	059729-003
23	CABLE ASSY, LABEL GAP	059495-002	059495-002
24	PLATE, MOTOR	059024-008	059024-008
25	FILTER ASSY, LINE AC, 3400	060246-001	060246-001
26	BATTERY, LITHIUM 3.6 V, 1.75 AH	586229	586229
27	FIRMWARE, 5 MIL PRINTHEAD, VER 1.7	059877S-008	060688S-005
28	PCB ASSY, MAIN	059050S-008	060538S-004
	PCB ASSY, MAIN, EXCHANGE *	059050E-007	060538E-004
23	CABLE ASSY, LABEL GAP	059495-002	059495-002
29	BRACKET, MEDIA PATH, UPPER	059022-006	059022-006
30	EDGE GUIDE, OUTER	059030-005	059030-005
31	BRACKET, MEDIA PATH, LOWER	059023-006	059023-006
32	THUMBSCREW ASSY	059781S-001	059781S-001
33	FASTENER, COTTER PIN 25	507717	507717
34	LEVER, PRINTHEAD ADJUSTMENT	059122-001	059122-001

3400A/B Spare Parts List (Cont.)

REF. NO.	DESCRIPTION	3400A DT/TTR PRINTER	3400B DT/TTR PRINTER
35	BLOCK, PIVOT	059037-005	059037-005
36	SPRING, TORSION, PRINTHEAD	059040-006	059040-006
37	WASHER, SST, .255ID X .407	506013	506013
38	BRACKET, PRINTHEAD PIVOT	059032-002	059032-002
39	HANDLE, PRINTHEAD PRESSURE	059039-011	059039-011
40	RETAINING RING, .250 DIA BASIC	501409	501409
41	PLATE, UPPER MODULE, OUTBOARD	062476-002	062476-002
42	ROLLER, SELF-STRIP	059510-001	059510-001
43	ROLLER, DRIVE	058997-005	058997-005
44	ROLLER, PLATEN	058996-008	058996-008
45	RETAINING RING, .250 DIA 8610	501401	501401
46	MOUNT, MARK SENSOR	059423-002	059423-002
47	BAR, TEAR, 3.5 IN.	057606	057606
48	POST, MEDIA	059117-005	059117-005
49	SHAFT, TTR RIBBON	059038-003	059038-003
50	CAM ASSEMBLY	062614-001	062614-001
51	RING, LABEL SUPPLY	059718-002	059718-002
52	CAP, MEDIA POST	059120-002	059120-002
53	SPRING, PAPER PATH RETURN	059484-003	059484-003
54	SHAFT, PAPER PATH	059509-002	059509-002
55	MOUNT, LABEL GAP SENSOR	062396-001	062396-001
24	PLATE, MOTOR	059024-008	059024-008
37	WASHER, SST, .255ID X .407	506013	506013
40	RETAINING RING, .250 DIA BASIC	501409	501409
45	RETAINING RING, .250 DIA 8610	501401	501401
56	WASHER, FLAT SST, .327 X .50	506040-006	506040-006
57	RETAINING RING	501413	501410
58	CABLE ASSY, MAIN MOTOR STEPPER	059021-001	059021-001
59	GEAR/PULLEY, CLUSTER, L/H	059044-007	059044-007
60	O-RING, 2.734 ID X .139	501462-002	501462-002
61	PULLEY, TAKE-UP, CLUTCH	059689S-008	059689S-008
62	GUARD, O-RING	059508-003	060363-003
63	GEAR/PULLEY CLUSTER, R/H	059511-005	059511-005
64	ENCODER, TTR CLUTCH	059114S-007	059114S-007
65	WASHER, FLAT SST, .817 x 1.0	506040-004	506040-004
66	WASHER, FLAT SST, .447 X .88	506040-003	506040-003

3400A/B Spare Parts List (Cont.)

REF. NO.	DESCRIPTION	3400A DT/TTR PRINTER	3400B DT/TTR PRINTER
67	RETAINING RING, EXTERNAL, .395	501461-001	501461-001
68	WASHER, FLAT SST, .327 X .50	506040-005	506040-005
69	CLAMP, LINER HUB	059124-003	059124-003
70	HUB ASSY, LINER TAKE-UP	061513-002	061513-002
71	BRACKET, CORE LOCKING	059125-005	059125-005
72	GEAR, PLATEN, D SHAFT	059028-006	059028-006
PARTS LISTED BELOW ARE NOT REFERENCED ON EXPLODED VIEWS.			
	SCREW, THREAD ROLL WITH CONE	522690	522690
	SCREW, PHILLIPS, WITH INT. STAR	526036	526036
	CORD, AC POWER, 3-COND, 8 FT.	586105	586105
	CORD, AC POWER, ENGLAND, 240 V.	586266	586266
	CORD, AC POWER, EUROPEAN, 220 V.	586267	586267
	TRANSFORMER ASSY, 115 V.	059016-001	059016-001
	TRANSFORMER ASSY, 230 V/UK 230 V.	059763-005	059763-005
	CONNECTOR, 2-POSITION SHORTING, .10 CTRS.	580213	580213
	CONNECTOR, HDR. 8-POSITION STRAIGHT THRU	580285	580285
	CONNECTOR, HDR. 4-POSITION STRAIGHT THRU	580359	580359
	CONNECTOR, RECEPTACLE, AC POWER	580096	580096
	CORE, RIBBON 8646 CDBD	048524	048524
	BEARING, BLIND FLANGED	059042-005	059042-005
	BEARING, FLANGED, .317 ID (PLASTIC HUB)	059841-002	
	BUSHING, BRONZE, .316ID, .475OD	061811-001	061811-001
	SHAFT, PINCH ROLLER	060316-001	060316-001
	RING, RETAINING .125 DIAMETER E-RING	501445	501445
	CIRCUIT BREAKER, SWITCH, 1 AMP.	501273-002	501273-002
	SPRING, COMPRESSION .36 OD	506823-002	506823-002
	DISK, PROGRAM VERSION 1.0 LABEL DEBUT	059920-004	059920-004
	LABEL, FRONT, IDENTIFICATION	060105-002	060105-002
	WASHER, SPR, CONL, .175 X .500 X .07H	521118-001	521118-001

3400A/B Spare Parts List (Cont.)

REF. NO.	DESCRIPTION	3400A DT/TTR PRINTER	3400B DT/TTR PRINTER
	PRINTER OPTIONS		
	3400A001 PRINTER, EXCHANGE *	060507E-001	
	PCB ASSY, PARALLEL INTERFACE	052713S-001	052713S-001
	PCB ASSY, PARALLEL INTERFACE, EXCHANGE *	052713E-001	052713E-001
	PCB ASSY, COAX I/O	057026S-002	057026S-002
	PCB ASSY, COAX I/O, EXCHANGE *	057026E-002	057026E-002
	PCB ASSY, TWINAX I/O	057029S-002	057029S-002
	PCB ASSY, TWINAX I/O, EXCHANGE *	057029E-002	057029E-002
	COVER, I/O SLOT	053866	053866
	GUIDE, PCB CARD EDGE, 3 INCH	501367-001	501367-001
	IC, TYPE 32K X 8 CMOS	573053	573053
	IC, TYPE 128K X 8, SRAM, 85NS	572088	572088
	CABLE ASSY, PRINTHEAD	059017-001	059017-001
	GUIDE. BATCH	048724	048724
	HUB, BATCH TAKE-UP	059753-002	059753-002
	EJECTOR, BATCH TAKE-UP	060433-002	060433-002
	MEMORY EXPANSION, 128K X 8	059716-001	059716-001
	TOOLS		
	PRINTHEAD ALIGNMENT TOOL	T42374-002	T42374-002
	ROLLER ALIGNMENT TOOL	T42389	T42389

* EXCHANGES ARE AVAILABLE ONLY IN NORTH AMERICA.

3400 Manuals

3400A Maintenance Manual - 060228
3400B/C Maintenance Manual - 062431
3400B User's manual addendum - 061537
Kanji/Katakana Option Supplement - 061536

Other 3400B Parts

3400B Standard Firmware - 060688-002
3400B Memory Expansion PCB, 2Meg - 061486S-001
3400B Memory Expansion PCB, 6Meg - 061486S-001

3400C Direct Thermal & Thermal Transfer Printer – Getting Started Guide Included **$1,995**

Printhead: 5 Mil (.125 mm) – Resolution: 203 dpi (8 dots/mm)

3400C

Power Supply Options

0		US Cord, 115 VAC	N/C
1		UK Cord, 220 VAC - 240 VAC	N/C
2		Europe Cord, 220 VAC - 240 VAC	N/C
3		Japan Cord, 100 VAC	$295

Interface Options

0		No Interface Options (Serial Interface)	N/C
1		Centronics Parallel Interface Card	$100
2		Coax Interface Card	$750
3		Twinax Interface Card	$750

Dynamically Allocated Memory Options

1		128 KB Image/Storage battery-backed SRAM	N/C
2		512 KB Image/Storage battery-backed SRAM	$325

Storage Memory Options

000		Standard	N/C
030		2 MB Storage (Flash) Memory	$460
050		8 MB Storage (Flash) Memory	$920

Media Handling Options

0		No Media Handling Options (straight-through printing)	N/C
1		Self-strip	$195
2		Cutter	$795

3400C					

3400C Field-installable Accessories*[1]

060221	Internal Batch Label Take-Up Adapter (requires self-strip)	$75
062785	512 KB Image/Storage battery-backed SRAM	$429
067585	2 MB Storage (Flash) Memory Expansion	$610
067586	8 MB Storage (Flash) Memory Expansion	$1,210
056830	Centronics Parallel Interface Card	$135
056836	Coax Interface Card	$1,195
056835	Twinax Interface Card	$1,195
9189C02	9189 RF Gateway (See page 20 for 9189 cable)	$1,395
067324	Basic Catch Tray for Cutter	$150
065145	3400, 3440, and 3600 User's Manual	$56

Label Design Software

	PrintSet Included (Printer Config.and Download Utility)	N/C

3400C MEDALLION Rates: *PLATINUMPLUS $325, PLATINUM $280, GOLD $250, SILVER $180, BRONZE $145.*

[1]Does not include installation fee.