# 3400 Bar Code Label Printer

**Intermec**

A **UNOVA** Company

# 1

# Read This First

*This chapter introduces the 3400 printer.*

# Introduction to the 3400 Printer

The Intermec 3400 printer is both a direct thermal and thermal transfer printer. An internal self-strip with integral liner takeup is a standard feature on the 3400A and 3400B and an option on the 3400C. Options available for the printer include: memory expansion, Coax/Twinax Interface Adapter cards, Centronics Parallel I/O, and batch takeup.

Use the following figures to help familiarize yourself with the 3400 bar code printer. It is important to familiarize yourself with the names of the parts before you begin any maintenance procedures.

*Note: Self-strip is an option on the 3400C and a standard feature on the 3400A and 3400B.*

*Printer Parts and Functions (Front View)*
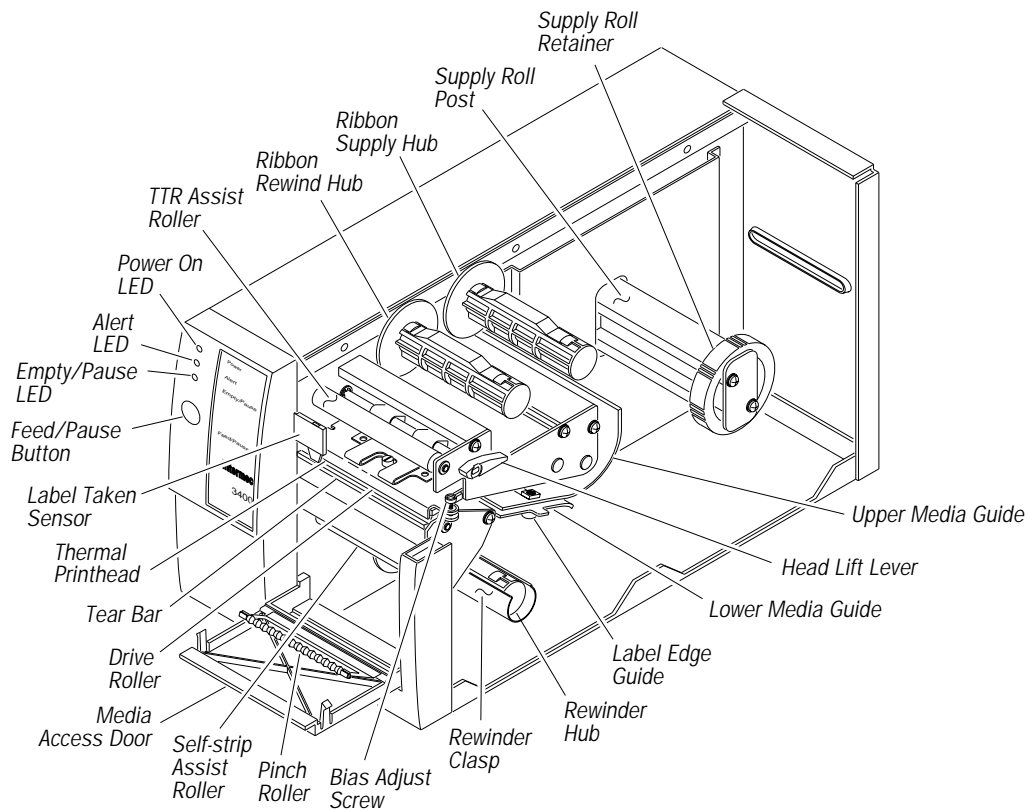


3400-070

## Printer Parts and Functions (Back View)



Darkness Adjust
Control

DIP Switches

Optional I/O
Board Port

Serial Communications
Port

ON/OFF
Switch

AC Power Cord
Receptacle

Media
Window

Media
Cover

Fanfold Media
Access Slot

3400-071
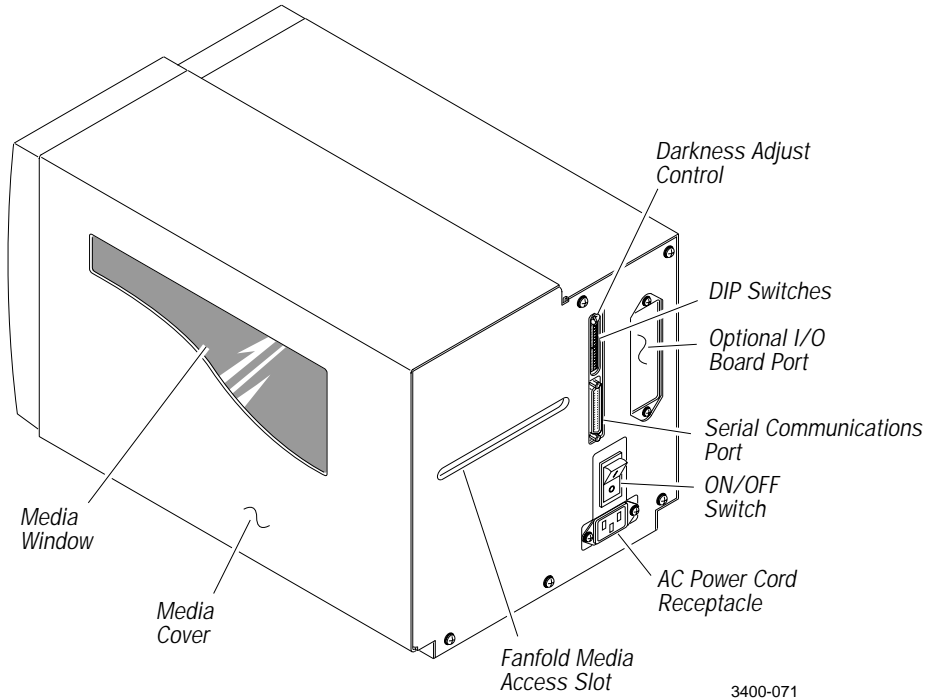
# *Printer Options*

Listed below are the options available for the 3400 printer. Consult your Intermec representative to order an option.

| Printer Option | Description |
|---|---|
| Memory Expansion | The memory expansion option provides an additional 384K of nonvolatile (battery backed) bulk storage to hold more formats, fonts, or bit-mapped graphics. It also increases the printer's image buffering capabilities. |
| Twinax Interface | Use this option to connect your printer to an IBM twinax cable system with a twinax interface. The twinax interface allows your 3400 printer to emulate an IBM 5256 Model 1 printer that operates with IBM System/34, System/36, System/38, or AS/400 host computers. |
| Coax Interface | The 3400 printer emulates an IBM 3287 printer when you connect it to IBM 3270 type A coax cable computer systems operating in the VTAM (CICS/IMS/TSO) or 8100 (DPPX) environments with the coax interface adapter. The coax adapter allows you to connect the printer to an IBM 3174/76/99 system controller/multiplexer. |
| Batch Takeup | This device automatically spools labels on the rewind hub as the 3400 printer prints them. The batch takeup option only supports small batches with a maximum OD of 5 inches. |
| Self-Strip | This 3400C option enables the printer to print out labels with the backing removed. The backing is wound on the rewind hub. |
| Cutter | This 3400C option cuts media after the printer prints an individual label or batch of labels. |
| Centronics Parallel Interface | This option lets the user connect the printer to a PC through a Centronics parallel interface in addition to the standard serial interface. |

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# Preventive Maintenance

*This chapter details how to maintain the 3400 printer in good working condition. A maintenance schedule is also included for your convenience.*

# Maintenance Schedule

Clean your printer regularly to maintain the quality of your labels and extend the life of your printer. Use the table on the following page to determine your cleaning schedule. Refer to the following illustration for the location of the parts you need to maintain. To clean the printer safely and effectively, use the following items:

• Isopropyl alcohol

• Cleaning brush

• Cotton swabs

• Vacuum cleaner

• Soapy water/mild detergent

• Clean, lint-free cloth
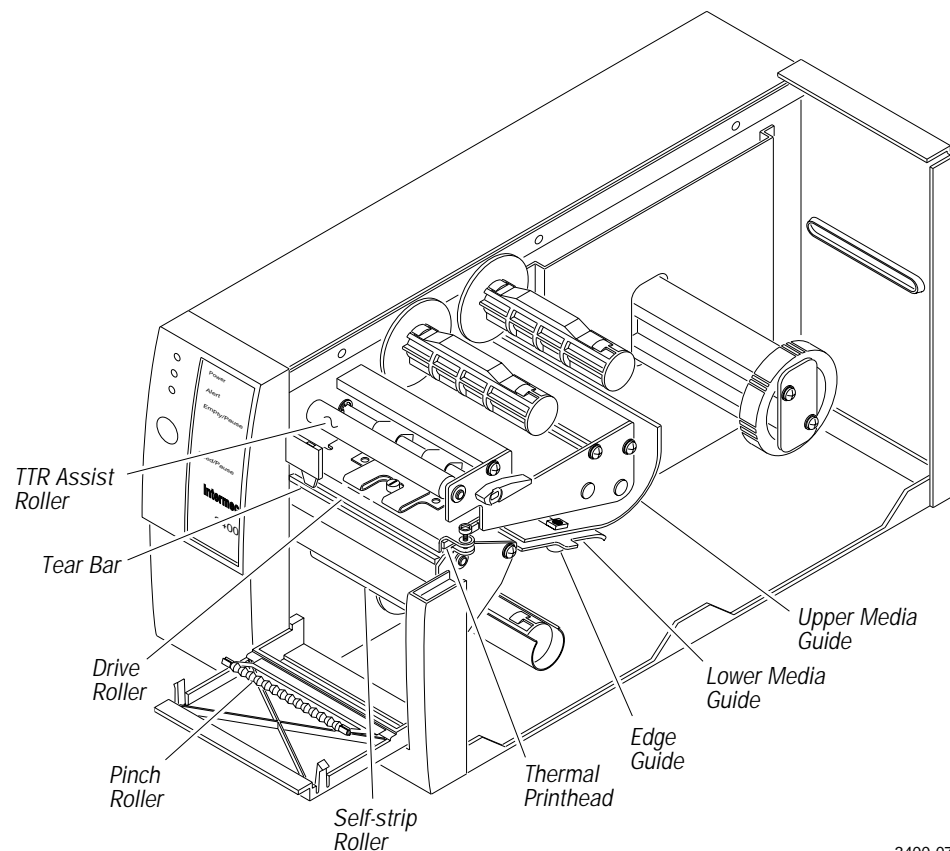


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*Printer Parts and Maintenance Schedule*

| Printer Part | Maintenance Interval |
|---|---|
| Printhead | Inspect after every roll of media. Clean after every two rolls (or 12,000 inches) of media or when necessary. |
| Drive Roller and Tear Bar<br>Media Path<br>Edge Guide and Media Guides<br>TTR Assist Roller<br>Self-strip Roller<br>Label Sensors<br>Pinch Roller | Clean after every five 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 five rolls of media or as necessary. Clean more often in environments that are harsh or dirty. |
| Cutter (3400C only) | Clean after every 10,000 cuts when cutting through adhesive-backed media. If you are not using adhesive-backed media, you should clean the cutter when it no longer cuts precisely. |
| Printer Cover | Clean as necessary. |

# Cleaning the Printer

The following procedures explain how to access the printer parts and clean them without causing any harm to the printer or to yourself.

**Warning**
*Switch off the printer power and remove the power cord before cleaning any part of the printer.*

## 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 two rolls (or 12,000 inches) of media or when necessary.

**Caution**
*Do not use sharp objects such as knives or screwdrivers to scrape the printhead clean. Cleaning with sharp objects will damage the printhead. Clean with only a cotton swab, or a clean, lint-free cloth or tissue damp with isopropyl alcohol.*

**To clean the printhead**

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. Open the media access door.

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 5 to 10 seconds for the print surface to dry. Replace the media and close the media access door.
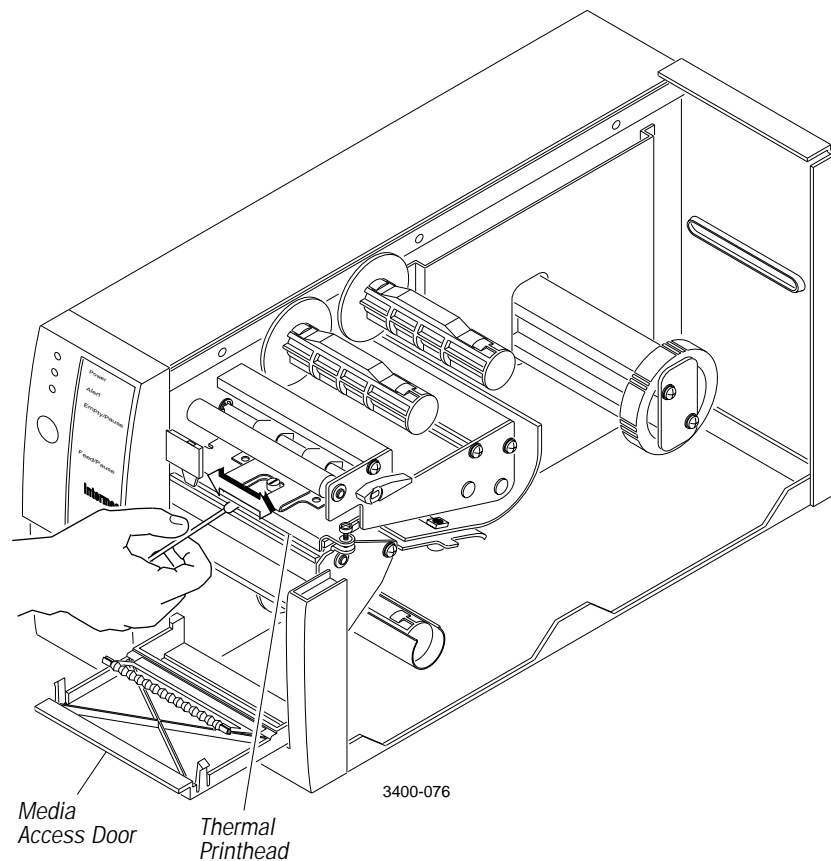


3400-076

*Media Access Door*     *Thermal Printhead*

5.  Engage the printhead by rotating the head lift lever counterclockwise until it locks in place.

6.  Replace the media cover.

## *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.

**To clean the drive roller and tear bar**

1. Remove the media cover.

2. Disengage the printhead by turning the head lift lever clockwise until the printhead releases. Open the media access door.

3. Clean the drive roller by using a lint-free 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 toward you lets you clean the entire drive roller surface.



3400-077
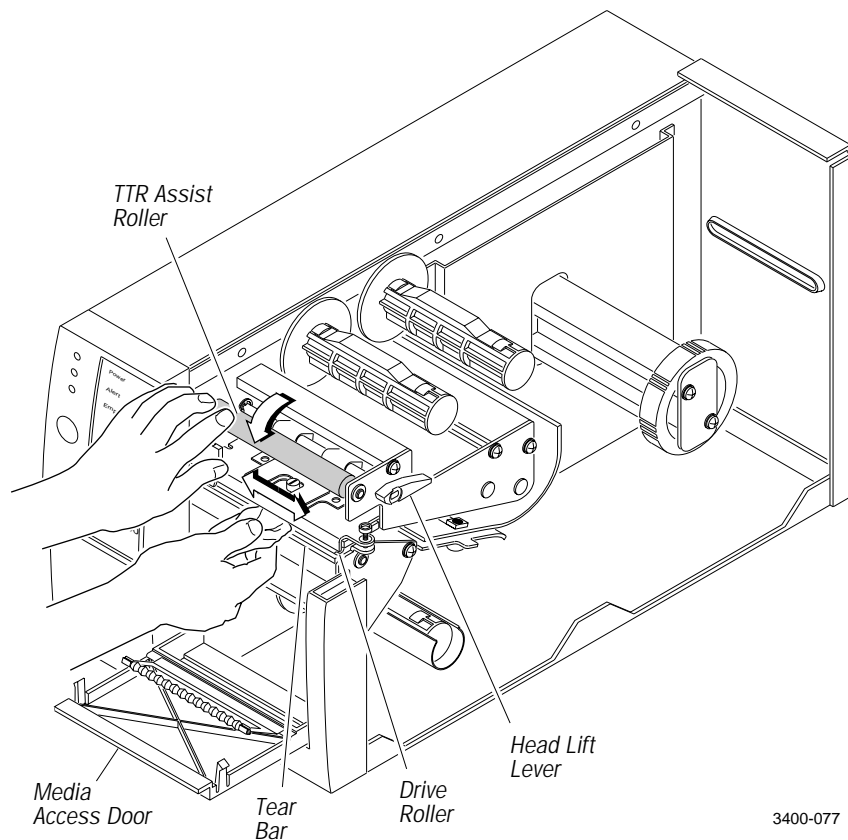
4. Clean both sides of the tear bar with a brush dampened with isopropyl alcohol. Remove all traces of dust, paper, and adhesive.

5.  Engage the printhead by turning the head lift lever counterclockwise until the printhead locks. Close the media access door.

6.  If you are finished cleaning, replace the media cover.

## *Cleaning the Media Guides and Media Path*

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 using 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.

### To clean the media guides and media path

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.

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*Cleaning the Media Guides and Media Path*



Upper Media
Guide

Lower Media Guide
*(The lower media guide
is spring loaded. It must be
held open to clean.)*

Media
Path
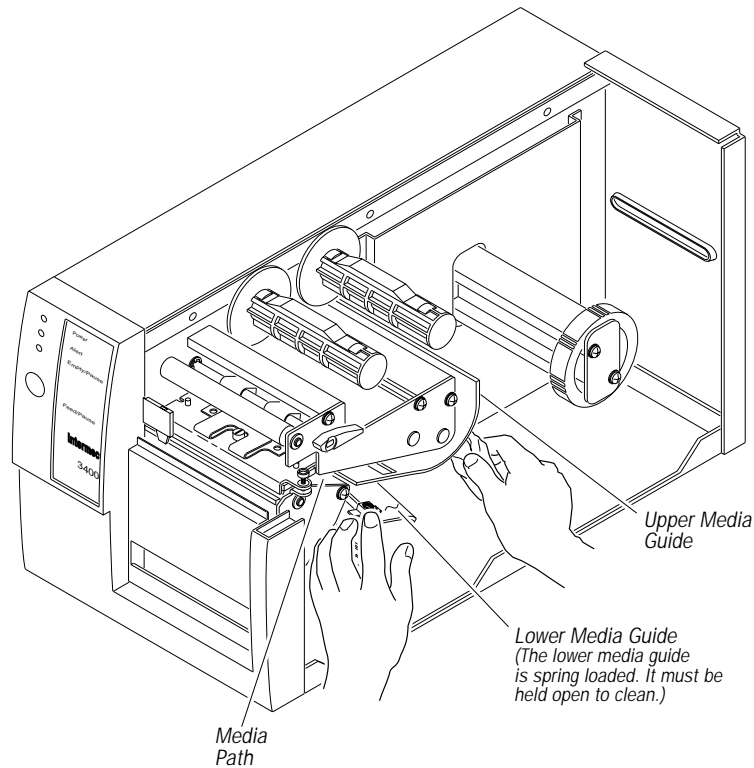
3400-078

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## Cleaning the Label Sensors

There are three label sensors on the 3400 printer that require regular cleaning:
the label taken sensor (if the self-strip option is installed), the label mark sensor,
and the label gap sensor.

**To clean the label sensors**

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 (if the self-strip option is installed) and the
   label mark sensor with a cotton swab moistened with isopropyl alcohol.
   Refer to the next 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.  Clean the label gap sensor with a cotton swab and alcohol.

7.  Replace the media and engage the printhead by rotating the head lift lever counterclockwise until it locks in place.

8.  Replace the media cover.



3400-079
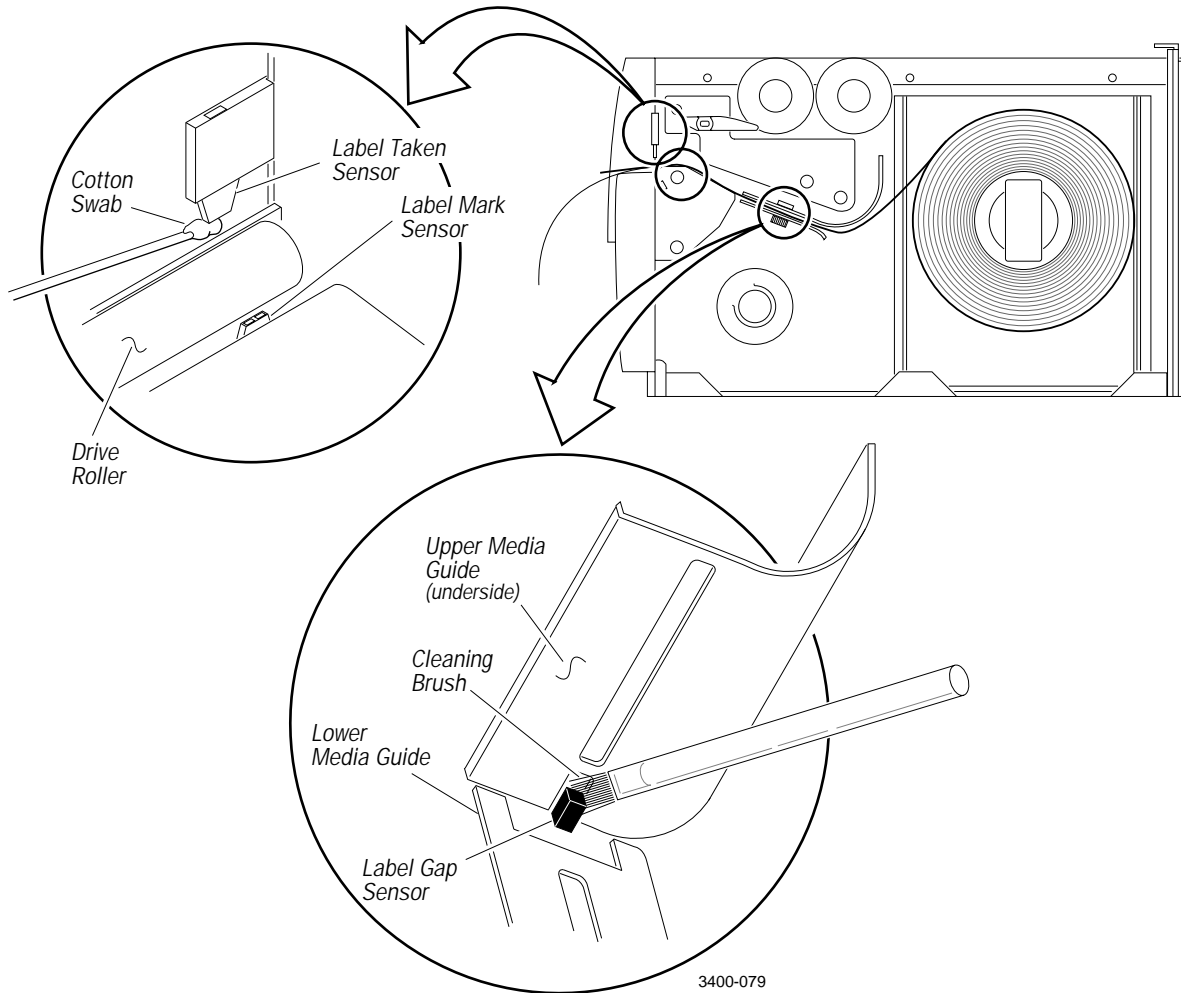
## Cleaning the Printer Covers

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

## Cleaning the Pinch Roller

You may need to clean the pinch roller if debris accumulates on the surface. The pinch roller is located on the back of the media access door. To clean the pinch roller, use a cotton swab moistened with isopropyl alcohol. Make sure that you rotate the pinch roller to get the debris out of all of the grooves.

*Pinch Roller*

*Media Access Door*

3400-080
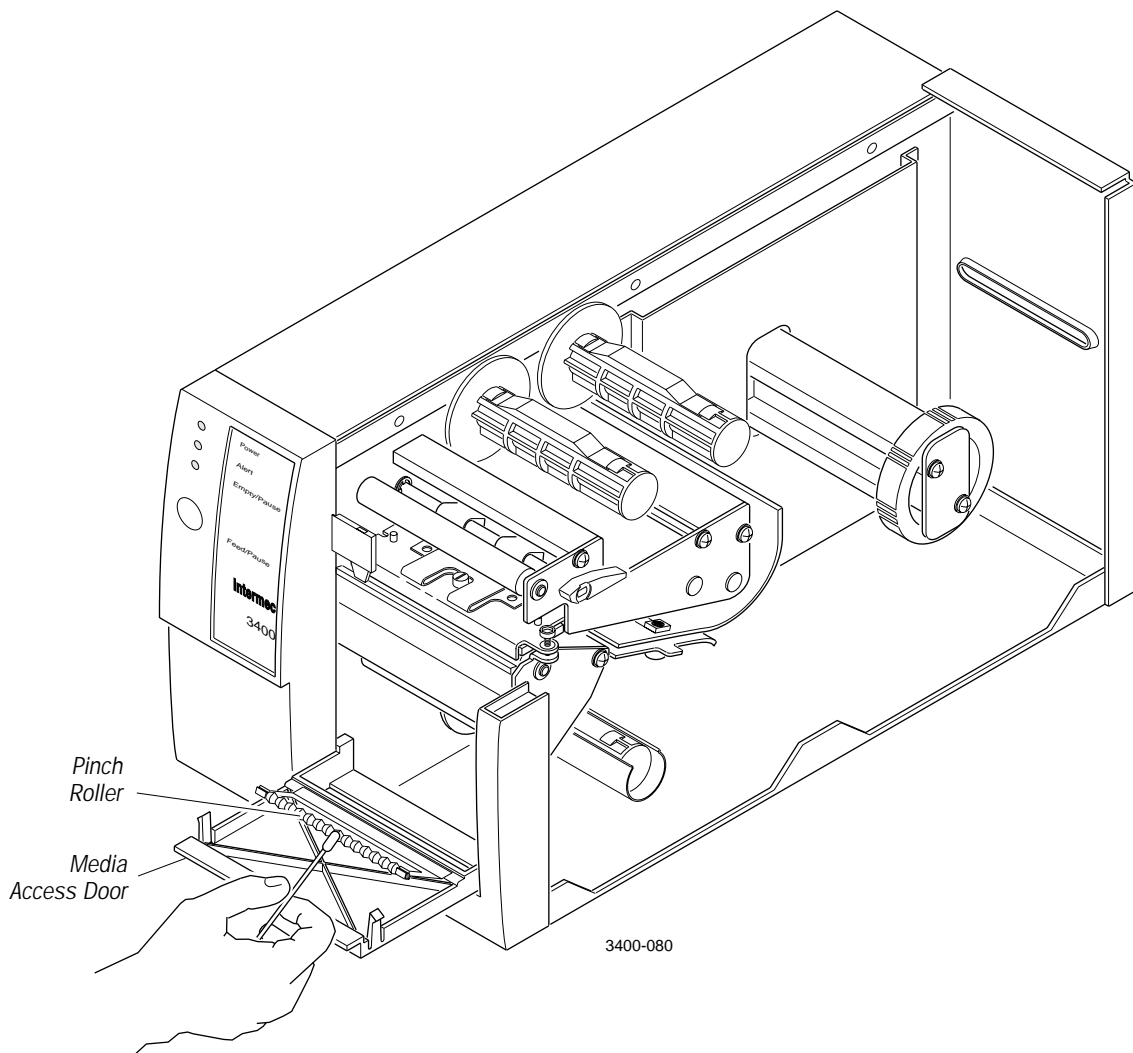
## *Cleaning the Cutter*

It is important that you routinely clean the cutter on the 3400C 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 information 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.

44XXU.005
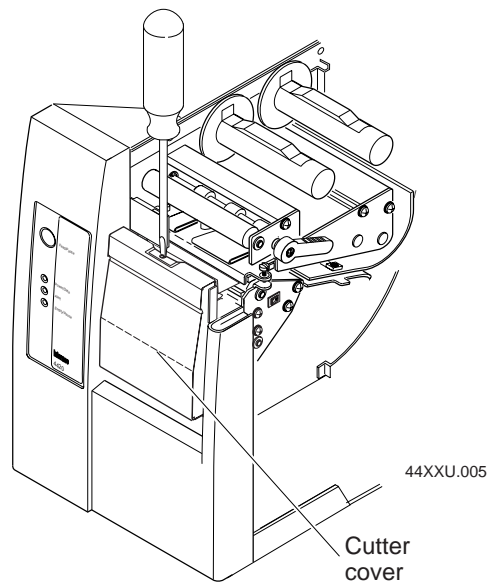
Cutter
cover

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

Cutter
blade

Tab

44XXU.006
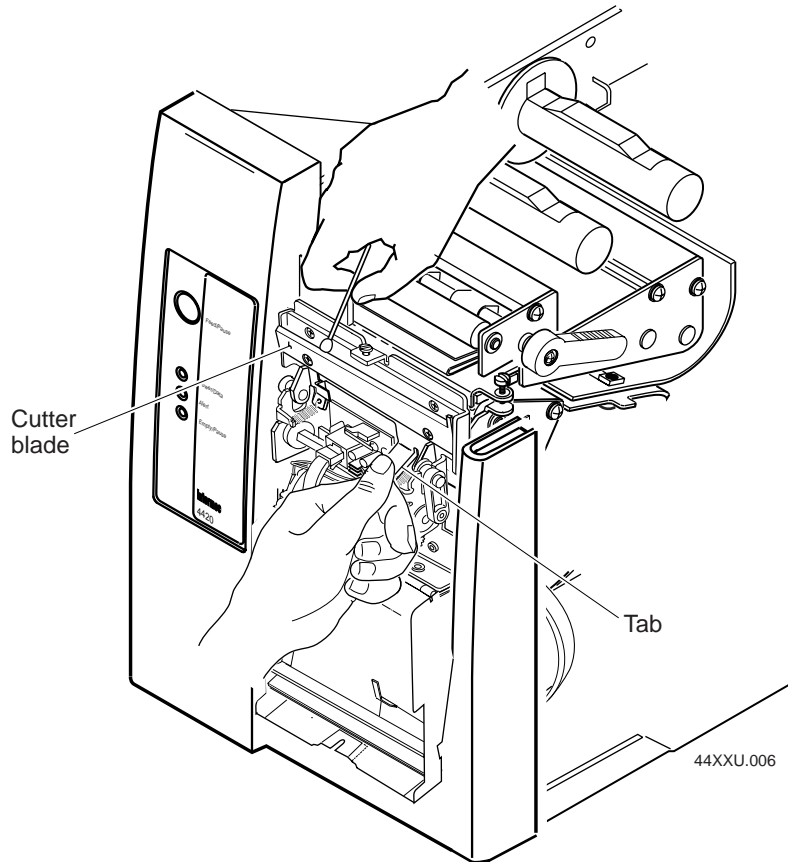
6.  With a cotton swab moistened with alcohol, clean the blade.

    ***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.   Lift the cutter cover up. When you 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.



Disable switch

Safety tab

4XXU.008
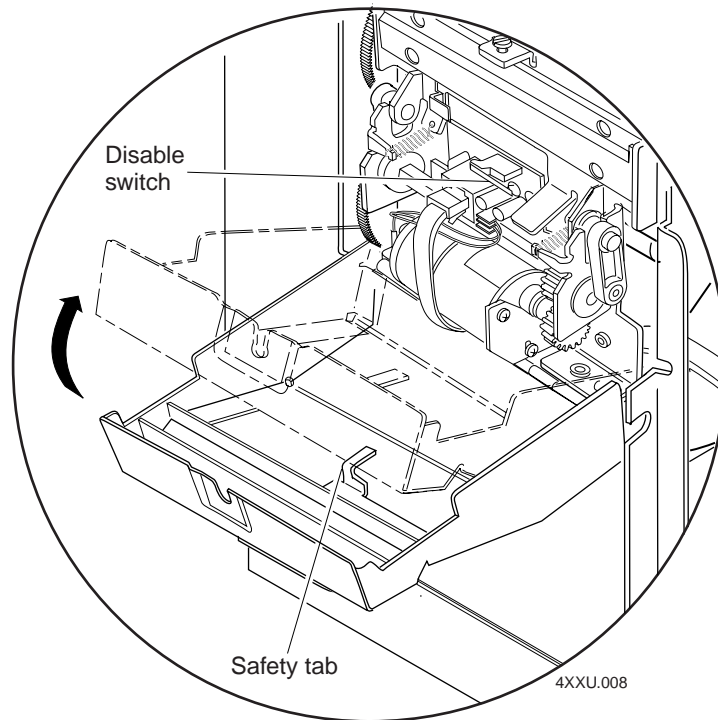
10.   With the cutter cover upright, tighten the screw on top of the cutter.

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.



Paper
guide

44XXU.007
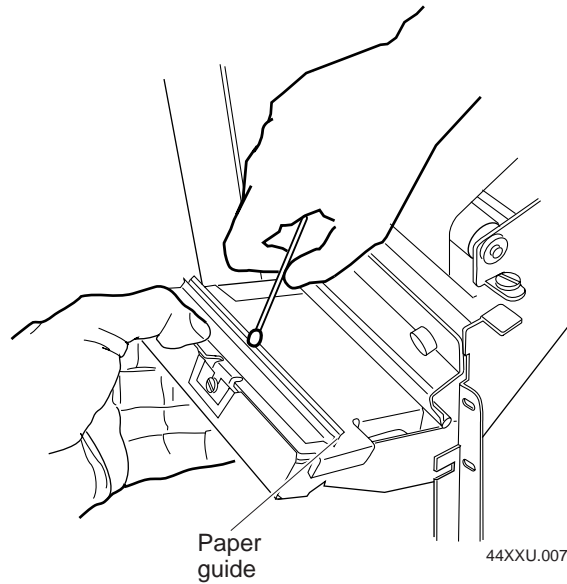
13. Swing the cutter up.

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.

# 3

# *Testing and Adjusting*

*Use the test and adjustment procedures after you have replaced a component to return the printer to optimum performance.*

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

## Using Test and Service Mode

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 following table for a list of the DIP switch settings.

3. Hold the **[FEED/PAUSE]** button down. The test begins immediately.

4. If you wish to perform another function, change the DIP switch settings and hold the **[FEED/PAUSE]** button. The function currently being executed is terminated and the new function is performed.

   *Note: For all Test and Service tests, pressing the **[FEED/PAUSE]** button pauses the current test. Holding the **[FEED/PAUSE]** button aborts the current test and starts a new test.*

5. To exit Test and Service mode, cycle the printer power.

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

# Test and Service DIP Switch Settings

Use the information provided in the following tables to set the DIP switches for the appropriate Test and Service mode function that you wish to perform. The zeroes indicate that the switch is turned OFF and ones indicate that the switch is turned ON.

Default settings are noted with an *

O = OFF
1 = ON

| TESTS | \| | 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 | | | | | | | | | Q |
| Software | | | | | | | | 1 | O | | | | | | | | | Q |
| Test Labels | | | | | 1 | O | O | | | | | | | | | | | |
| Print Quality | | | | | | | | O | O | | | | | | | | | Q |
| Pitch | | | | | | | | 1 | O | | | | | | | | | Q |
| Page | | | | | O | 1 | O | O | O | | | | | | | | | |
| Single Page | | | | | | | | | | | N | N | N | N | N | | | Q |
| All Pages | | | | | | | | | | | 1 | 1 | 1 | 1 | 1 | | | Q |
| Format | | | | | 1 | 1 | O | O | O | | | | | | | | | |
| Single Format | | | | | | | | | | | N | N | N | N | N | | | Q |
| All Formats | | | | | | | | | | | 1 | 1 | 1 | 1 | 1 | | | Q |
| UDC | | | | | O | O | 1 | O | O | | | | | | | | | |
| Single UDC | | | | | | | | | | | N | N | N | N | N | N | N | Q |
| All UDCs | | | | | | | | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | Q |
| Font | | | | | 1 | O | 1 | O | O | | | | | | | | | |
| Single Font | | | | | | | | | | | N | N | N | N | N | | | |
| All Fonts | | | | | | | | | | | 1 | 1 | 1 | 1 | 1 | | | |
| **Data Line Print** | | *1 | O | O | O | O | O | O | O | | | | | | | | | |
| **Cloning** | | O | 1 | O | | | | | | | | | | | | | | |
| Receiver | | | | | O | O | O | O | O | | | | | | | | | |
| Sender | | | | | 1 | O | O | O | O | | | | | | | | | |
| **Selective Transfer** | | 1 | 1 | O | | | | | | | | | | | | | | |
| Receiver | | | | | O | O | O | | | | | | | | | | | |
| Send Pages | | | | | 1 | O | O | S | | | | | | | | | | |
| Single Page | | | | | | | | 1 | S | | S | S | S | D | D | D | D | D |
| All Pages | | | | | | | | | 1 | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Send Format | | | | | O | 1 | O | S | | | | | | | | | | |
| Single Format | | | | | | | | 1 | S | | S | S | S | D | D | D | D | D |
| All Formats | | | | | | | | | 1 | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Send UDC | | | | | 1 | 1 | O | S | | | | | | | | | | |
| Single UDC | | | | | | | | 1 | S | | S | S | S | S | S | S | | |
| All UDCs | | | | | | | | | 1 | | 1 | 1 | 1 | 1 | 1 | 1 | | |
| Send Font | | | | | O | O | 1 | S | | | | | | | | | | |
| Single Font | | | | | | | | 1 | S | | S | S | S | D | D | D | | |
| All Fonts | | | | | | | | | 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 | | | | | | | | | | | |

**Q:** OFF = Batch of 1.  ON = Batch of 100.
**N:** Page/Format/UDC/Font number. Least significant bit first.
**S:** Source Page/Format/UDC/Font number. Least significant bit first.
**D:** Destination Page/Format/UDC/Font number. Least significant bit first.

3400-095

## *Printing Test Labels*

The 3400 printer can print a variety of test print labels that provide you with information about the printer's configuration and the quality of the print. To print out a hardware configuration test label, refer to Step 1 in "Using Test and Service Mode" earlier in this chapter. If you wish to print out a user-defined configuration label, a print quality label, or a pitch label, follow the Test and Service Procedure outlined earlier and set the DIP switches according to the "Test and Service DIP Switch Settings" table.

Once the printer begins to print test labels, it continues to print new labels until completed or until you press the **[FEED/PAUSE]** button. Pressing and releasing the button causes the printer to momentarily stop printing labels. Pressing and holding the button causes the printer to stop performing the Test and Service function.

The test labels can be used for checking printhead alignment, printhead bias, dots out of specification, label tracking, and ribbon wrinkling.
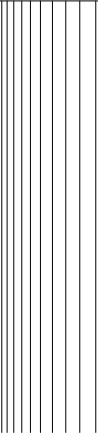
### *Hardware Configuration Label*

The hardware configuration label is the first label printed when you enter Test and Service mode. This label contains information on:

- printer memory including both storage and image RAM.

- printer mileage including inches processed and inches burned.

- printhead settings including width, dot size, and burn pot setting.

- firmware checksum, program, and version number.

- vertical lines for adjusting the printhead alignment. Use the bias adjust screw to compensate for printhead alignment problems with narrow media. See "Using the Bias Adjust Screw" later in this chapter. Use the "Printhead Alignment" procedure to achieve optimum print quality.

To achieve the highest quality label, including the vertical lines used to adjust the printhead alignment, print the hardware configuration label at a speed of 3 ips (inches per second).

## Hardware Configuration Label

```
3400 Hardware Configuration

Memory Installed
    Storage RAM      : 120 kilobytes
    Image RAM        : 134 kilobytes

Mileage
    Inches Processed : 600
    Inches Burned    : 221
    Labels Cut       : 0

Printhead
    Width            : 832 dots
    Dot Size         : 5.0 mil
    Burn Pot Setting : 0

Firmware Checksum    : 7BB9
    ROM0 (U9)        : 2148
    ROM1 (U8)

Program              : 059877
Version              : 0.12
```

3400-085

### Software Configuration Label

This label lists current configuration parameters that are set from the host computer. It also lists defined pages, formats, graphics, fonts, and installed options. This label is meant to be used as a reference.

```
INTERMEC 3400 Printer

Program Version: 1.1              PRINT SPEED – 3.0 IPS          RIBBON SAVE-Disabled   PARITY-Odd

Pages Defined : 0, 2              IMAGE BANDS – 20               SELF STRIP-Disabled    STOP BITS-1

Formats Defined : 0, 1, 2         MAX LABEL LENGTH – 4 inches    CUTTER-Disabled        PROTOCOL-Xon/Xoff No Status

Fonts Defined: 0,1,2,3,4,7,20,21,22,   LABEL STOCK – Inter-label gap   DARK ADJUST – 0    DEVICE ADDRESS – A
23,24
                                 MEDIA TYPE – Direct Thermal    FORMS ADJUST – 0       INTERNAL OPTIONS – none
Graphics Defined : none
                                 MEDIA LENGTH – 0 inches        SENSITIVITY – 420      EXTERNAL OPTIONS-Self-strip

                                 CHARACTERSET – 256 Characters  BAUD RATE – 19200

                                 TRANSLATION – Disabled         DATA BITS – 7

                                 EMULATION – Disabled           MESSAGE LENGTH – 255

                                 LABEL RETRACT – Disabled
```

3400-086

## Print Quality Label

If you choose to print the Print Quality label, a label containing bar codes and the model number prints. Use it to determine whether you are attaining the best print quality possible. If you notice problems with the print quality, use the "Printhead Alignment" procedure in this chapter to adjust the printhead for optimal performance.



AXISI.005

### Pitch Label

If you choose the Pitch label, a gray scale that prints every third dot is printed. You can use it to determine whether the printhead is printing evenly. The label you see should present a regular gray pattern with dots that line up diagonally when held at an angle. Irregularities or chips may signal a problem with the platen roller or the media path. Uneven print may indicate an uneven printhead or skewed print path.
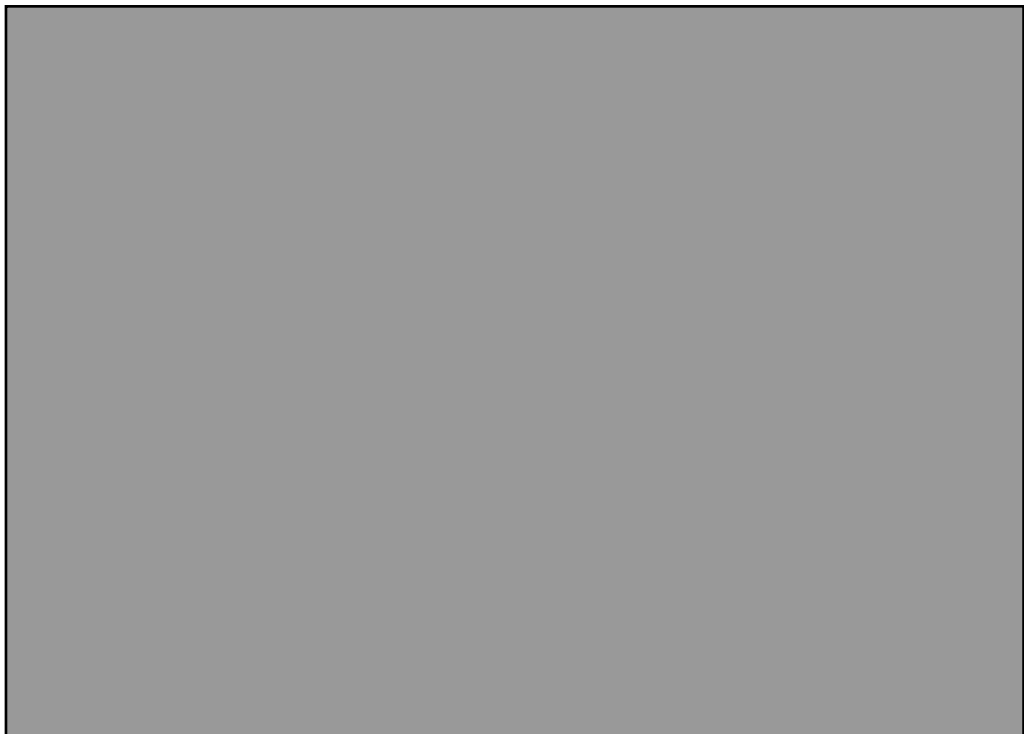


3400-088

## Communications Self Test

If the printer is experiencing a printing problem, you may want to make sure that the printer is communicating with the host. The following test indicates whether the serial port receiver works.

**To test the host-to-printer communication**

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 when the printer begins to print the hardware configuration test label. You are now in data line print mode within the 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, but 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:

    *Note: The ^Z character is formed by pressing the **Ctrl** key and the **Z** key simultaneously.*

    ```
    C:\MODE COM1: 96,E,7,1,N Enter
    ```

    ```
    C:\COPY CON COM1: Enter
    ABCDEF^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 the COM1: port.

    `ABCDEF` are random characters entered at the host.

    `^Z` **Enter** sends the information to the printer.

    The following is printed:



3XXXU.021

5. Reset your original DIP switch settings.

6. To enter normal print mode again, switch the printer power OFF and then ON again.

If this procedure does not work, make sure that the DIP switches are set to the default configuration and that the printer cable is securely plugged into COM1 of your PC.

*Note: If you are using a different platform to communicate with your printer, please refer to your host computer user's manual and the* IPL Programming Reference Manual *for information on downloading commands.*

## Test and Service Mode Command Descriptions

The following table describes the Test and Service mode commands. To enter Test and Service mode from Print mode, send <ESC>T from the host terminal.

*Note: All commands in Test and Service mode end with the command terminator (;), except the last command in a message.*

| Command Code | Test | Description |
|---|---|---|
| A | Transmit Ambient Temperature* | Transmits the ambient temperature sensor output back to the host. The values range from 00 to FF. |
| B | Printhead Resistance Test* | Causes the printer to begin the printhead resistance test. The printer will respond with the ASCII character string pass or fail. |
| C | Print Pitch Label | Causes the printer to print the pitch label. |
| D | Reset Printer Configuration | Sets the printer configuration to the factory defaults. |
| G | Transmit Transmissive Sensor Value | Transmits the label gap output back to the host. The values range from 00 to FF. |
| K | Dark Adjust* | This command changes the darkness of the print on your labels. Use this command for fine tuning only. |
| L | Transmit Paper Path Open Sensor Value* | Transmits the Paper Path Open switch value back to the host. A value of 0 indicates the paper path is open and a value of 1 means it is closed. |
| M | Transmit Reflective Sensor Value | Transmits the label mark reflective sensor output back to the host. The values range from 00 to FF. |
| P | Transmit Printhead Temperature Sensor Value | Transmits the Printhead Temperature Sensor output back to the host. The values range from 00 to FF. |
| Q | Print Quality Label | Causes the printer to print out the print quality program and model number label. |

*Test and Service Mode Command Descriptions (continued)*

| Command Code | Test | Description |
| --- | --- | --- |
| R | Exit Test and Service | Causes the printer to exit Test and Service mode. |
| S | Transmit Printhead Resistance Values* | Transmits the average, maximum, or minimum printhead dot resistance value back to the host. Each value is a numeric data string separated by a comma. |
| T | Transmit Label Taken Sensor Value | Transmits the label taken sensor output back to the host. The values range from 00 to FF. |
| U | Transmit 40 Volt Supply Value* | Transmits the 12 volt supply output back to the host. The values range from 00 to FF. |
| V | Transmit 24 Volt Supply Value* | Transmits the 24 volt supply output back to the host. The values range from 00 to FF. |

*\*The printer ignores this command.*

# *Printer Adjustments*

The following procedures tell you how to perform minor adjustments on the 3400 printer. Adjustments include the bias adjust, the darkness adjust control, the mark sensor, the label gap sensor, and the printhead adjustment lever.

*Note: You can adjust the sensors only on the 3400A and the 3400B.*

## *Using the Bias Adjust Screw*

You may experience problems with print quality (ribbon wrinkling) 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 screw.



Standard Screwdriver

Printhead Bias Adjust Screw

Printhead Bias Adjust Screw (Turn clockwise to raise the outboard side of the printhead.)

Label    Drive Roller    Printhead

Print direction
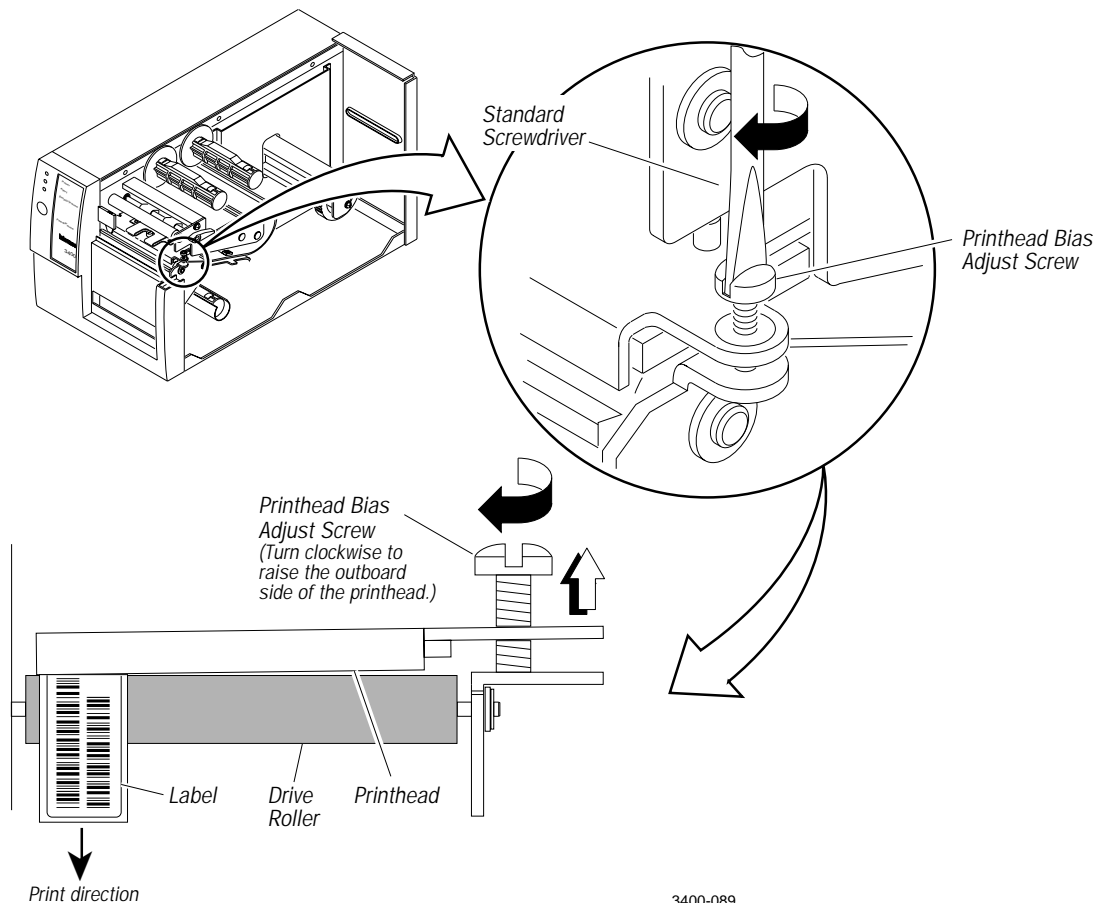
3400-089

## *Setting the Darkness Adjust Control*

The darkness adjust control 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 adjustment that allows you to compensate for variations in the media (lot to lot), the printhead, or the printer. It is located on the back of the printer and requires a small straight slot screwdriver to adjust. Use the darkness adjust control in combination with the darkness adjust command (<SI>d) to fine tune how dark your labels print. Maximize the darkness by turning the darkness adjust control clockwise. Turning the control counterclockwise minimizes the darkness.



Turn the darkness adjust control clockwise for maximum density.

Darkness Adjust Control

Turn the darkness adjust control counterclockwise for minimum density.

Screwdriver

3400-090
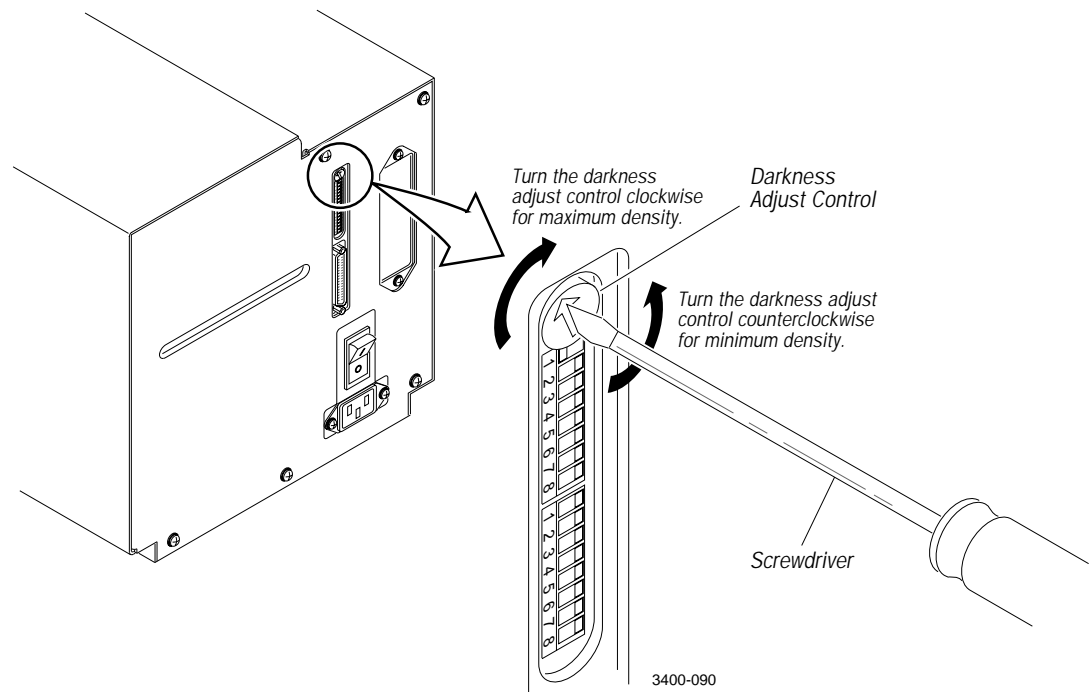
## *Adjusting the Label Mark Sensor*

The mark sensor detects the mark on the back of continuous media stock. The output is then used to determine the start of print. This sensor is located under the label pathway across from the platen roller. Use your index finger to reach underneath the lower guide and slide the mark sensor to the correct position. The mark sensor can be positioned from the inboard edge to the center of the paper path.

*Note: You can adjust the sensors only on the 3400A and the 3400B.*



Platen Roller

Locate the label mark sensor behind the platen roller near the inboard edge of the printer. Use your index finger to adjust the label mark sensor.

Inboard edge of printer. The platen roller is not shown for clarity only.

Label Mark Sensor
(The label mark sensor can be positioned no more than 1" from the inboard edge.)
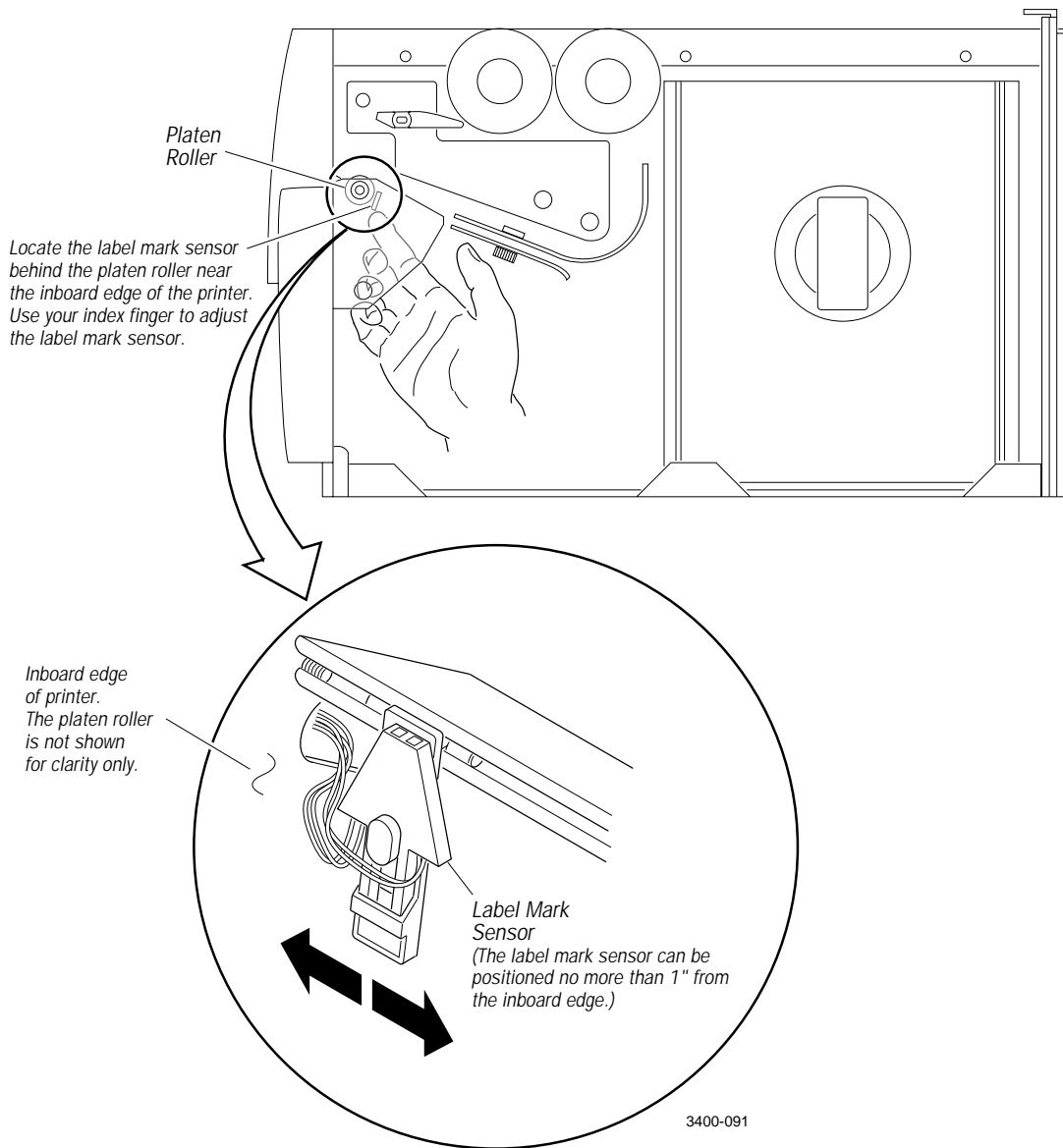
3400-091

## *Adjusting the Label Gap Sensor*

The label gap sensor output enables the software to determine the leading edge of a label by detecting the label gap. The label gap is the space between labels on the backing material. This reading enables the printer to properly position the start of print.

*Note: You can adjust the sensors only on the 3400A and the 3400B.*

### To adjust the label gap sensor

1.  Remove the media cover and the electronics cover.

2.  Connect the positive lead of a multimeter to TP15 (GAP) and the negative lead to TP14 (GND) on the main board.

3.  Insert the label backing *only* in the label gap sensor. Adjust R124 to one volt ± 0.2 volt.

4.  Insert both the label and the label backing in the sensor. Verify that the voltage at TP15 (GAP) is greater than 3 volts.

5.  Check the printer for proper operation.

6.  Replace the printer covers.

## *Adjusting the Mark Sensor Potentiometer*

The mark sensor output enables the software to detect the black mark on the back of continuous media stock. If your printer is having trouble determining the start of print, you may need to adjust the mark sensor potentiometer.

*Note: You can adjust the sensors only on the 3400A and the 3400B.*

### To adjust the mark sensor potentiometer

1.  Enable the printer for mark sensing using the <SI>T{2} command.

2.  Connect the positive lead of a digital volt meter to TP18 and the negative end to TP14.

3.  Place the white portion of a label under the mark sensor.

4.  Adjust R191 to 1 volt ± 0.2 volt.

5.  Place the black mark portion of the label under the mark sensor.

6.  The voltage at TP18 should now be greater than 2.5 volts.

## *Adjusting the Printhead Adjustment Lever*

The printhead adjustment lever is located at the end of the printhead pivot bracket. It allows fine tuning of the printhead. The printhead adjustment lever provides three stops forward movement of the printhead and three steps backward from center position in 0.006 inch increments. To achieve the best print quality, use a straight slot screwdriver to turn the printhead adjustment lever:

- clockwise to move the printhead forward.
- counterclockwise to move the printhead backward.



Printhead
Adjustment
Lever

moves printhead backward

moves printhead foreward

3400-092
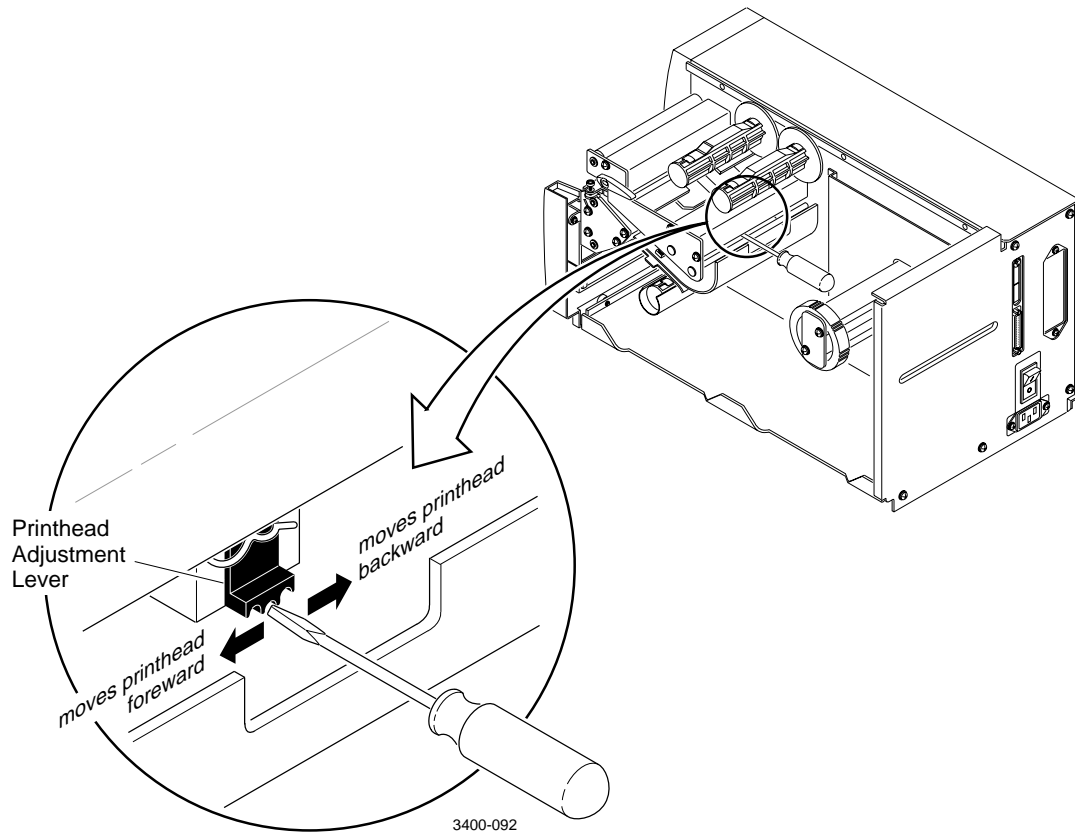
# *Printhead Alignment*

To properly align the printhead, follow the steps outlined below. You should perform this procedure only when necessary. To perform this procedure, you need the following tools:

- Printhead Alignment tool, Part No. T42374
- 9/64 inch Allen screwdriver

### To align the printhead

1. Switch off the printer power and remove the power cord.
2. Remove the media cover.
3. Raise the head lift lever and remove any media in the label path.

   *Note: The printhead must be installed in the printer.*

4. Loosen the two 9/64 inch Allen screws located on the printhead yoke in back of the printhead heat sink. Make sure the printhead adjustment lever is in the neutral position (perpendicular).
5. Install the printhead alignment tool, T42374, and press the printhead assembly down on the platen roller. Align the tool with the notches in the heatsink and the printhead.
6. Alternately tighten the two 9/64 inch printhead yoke screws until secure.
7. Remove the printhead alignment tool.
8. Reload media.
9. Reattach the media cover and install the power cord.
10. Switch the printer power on and test for proper printhead alignment by printing out the print quality and pitch labels.

**Printhead Alignment Procedure**



Guide Pins
(Align with the notches
on the heatsink and printhead.)

Heatsink

Notch

Place the cutouts
of the printhead
alignment tool onto
the shaft of the platen
roller.

Printhead
Alignment
Tool

Printhead
Alignment
Tool

Head Lift Lever
(Rotate counter-
clockwise to secure
the printhead.)
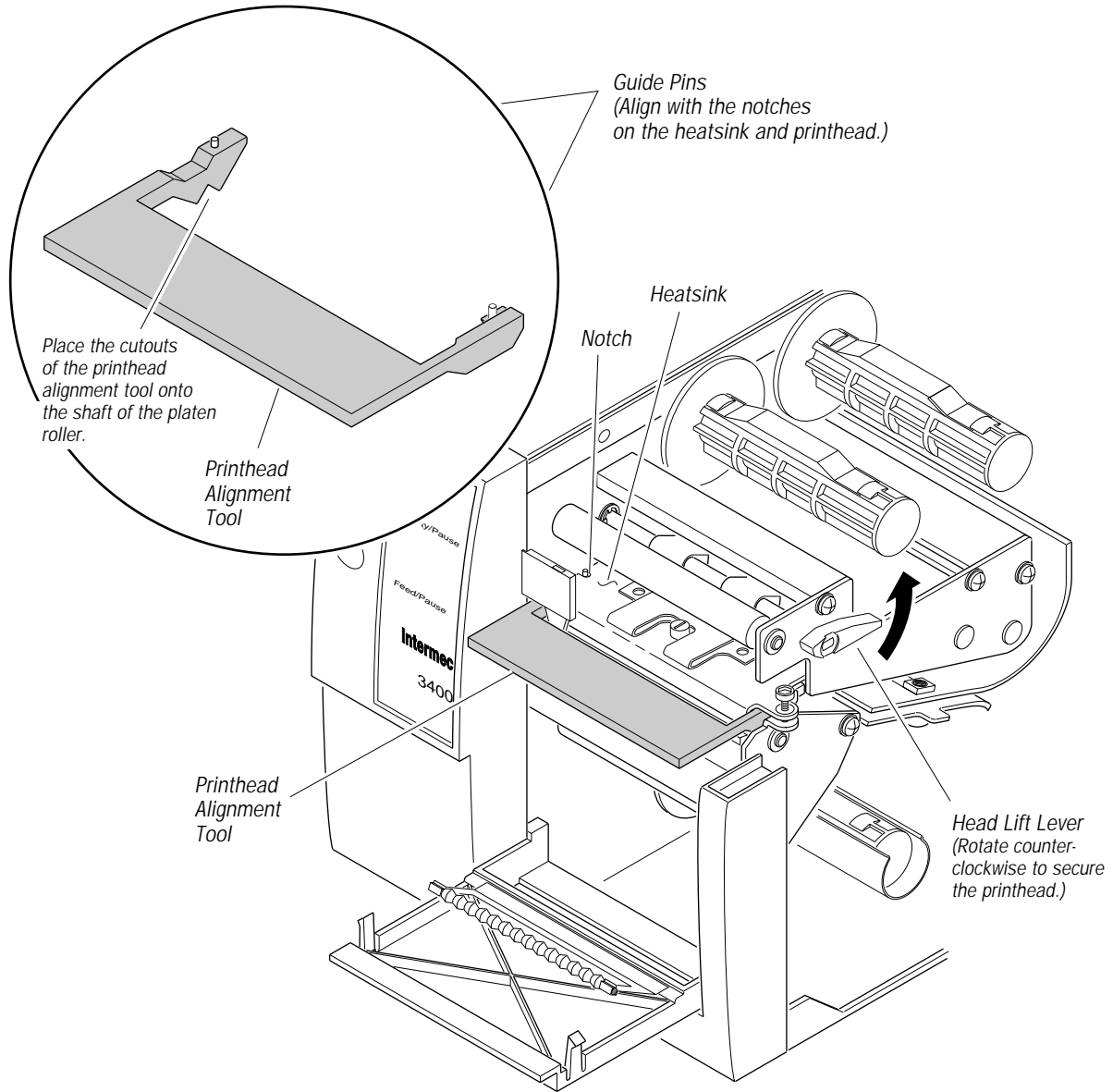
3400-093

# Roller Alignment Procedure

To properly align the rollers, follow the procedure outlined below. You should perform this procedure every time a roller is replaced. To perform this procedure, you need the following tools:

- Roller Alignment Tool, Part No. T42389

- #2 Phillips screwdriver

**To align the rollers**

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

2. Raise the printhead.

**Caution**
*Align only one guide plate at a time (either the upper or the lower) to put the rollers back into factory alignment. If both plates are loosened, it may not be possible to align the rollers outside of the factory.*

3. Loosen the Phillips screws on the guide plate that you are aligning.

4. Align the three holes in the roller alignment tool with the platen roller, the self-strip roller (if the self-strip option is installed), and the TTR assist roller. The fourth hole in the roller alignment tool fits over the black plastic cap closest to the front of the printer.

## *Aligning the Rollers*
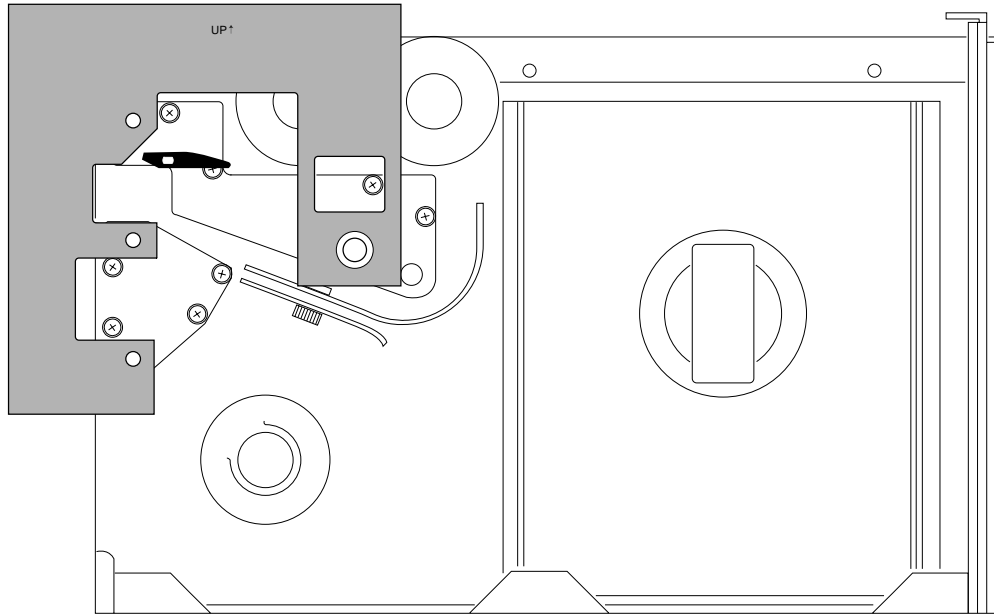


3400-094

5.  When the tool fits properly on all of the rollers and the bushing, tighten the screws on the guide plate that you are aligning. The rollers are now in factory alignment.

6.  Lower the printhead and replace all of the printer covers.

**4**

# *Theory of Operation*

*This chapter describes the operation of the electronics on the 3400 thermal printer. Parts referenced in this chapter appear on the schematic of the Main PCB assembly, 3400A Part No. 059050-003, 3400B Part No. 060538-010, and 3400C Part No. 066070-007.*

# Power Supply

The power supply for the 3400 is primarily a linear supply with a switching buck converter for the 24V printhead supply. The switching buck converter takes the unregulated +40V and uses a switching transistor to reduce the output voltage to +24V. The base mechanism is equipped with an AC input filter and a transformer that 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 the DC voltage to +5V. Capacitors C53-C56 are used for filtering and storing energy for hold time at power down or blackout. VR1 is rated at 1.5A and is sufficiently heatsinked to handle this amount of current. The typical +5V load is approximately 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 that 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. This prevents excessive motor currents on power up. Another zener diode is used to supply 15V that is used by the +24V buck converter.

## +24V

The +24V supply is generated by a switching buck converter.

# Power Fail Detection

The power fail detection circuitry consists of IC U31, diodes D7, D8, D9, and D11 and various 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 used 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 brownouts. C44 and C49 are also for filtering. C46 and R107 set up a time constant of 1.5 60 Hz cycles to filter out brownouts. The hold time of the +5V varies with line voltage and the state of the printer. The printer exceeds 20ms at low line and when not printing.

# Battery

The battery is used to back up 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 used to isolate the battery voltage from VCC of the circuit card when the power is off, but it has minimal voltage drop to RAMVCC when power is on. Transistor Q2 and IC U5 cause the RAM chip select to be held in a high (inactive) state when /RESET is low to prevent inadvertent writes to RM during power up or power down.

The 3400C includes an extra power resistor and switch that enables you to short RAMVCC to ground to clear the RAM.

Battery Life Calculations:

Battery capacity = 1.75 Ah

RAM Data Retention current = 20 μA maximum, 1 μA typical

With printer off all the time and worse case:

Battery life = 1.75 Ah / 20 μA = 87,500 hours = 10 years

With printer off all the time and typical case:

Battery life = 1.75 Ah / 1 μA = 1,750,000 hours = 200 years

# Reset

/RESET is generated by MKC34064 under voltage sensing circuit, U29. The output of U29 is 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 L298N dual full-bridge motor driver. The L298N 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 is disabled. If M1 or M4 is HIGH, the winding is enabled. With this amount of control, the printer can either use full or half stepping.

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. Varying the reference voltage allows the printer to switch 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 at power-up initialization, the motor windings are off.

# Processor

The processor used in the 3400 is a MMC68332 32-bit integrated microcontroller. 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, a system integration module. The MC68332 was chosen for its 32-bit processing power along with its 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 eight of these chip selects. /CSBOOT is used to access the EPROM of the system. It can handle up to 1M of EPROM organized as 512K x 16. /CS0 and /CS1 are used for accessing DRAM. The 3400C routes the microprocessor chip-select to logic g /C n11g to provide a second 1MB of EPROM. One ROM DSACK is internally generated by the processor. The CPLD U23 handles DSACK generation for the extra ROM. /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 and to read the DIP switches. /CS6 is used as A19. For the 3400C, /CS7, /CS8, /CS9, and /CS10 are used as A20, A21, A22, and A23.

## *TPU*

The TPU is the Time Processor Unit of the MC68332. It has 16 programmable channels that 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 contains built-in functions, but it is also possible to 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:** This input captures the /STPINT signal. When /STPINT goes active, channel 0 interrupts the CPU to indicate a step, links to channels 1 through 6 and 10, and sets up a match for the half-step time.

**Channels 1 to 4:** These outputs control motor signals M1 to M4, respectively. After initialization to set up motor direction, each channel outputs the next bit of a programmable bit pattern whenever a link is received from channel 0. A fixed delay is set for each channel to ensure that all four channels switch simultaneously.

**Channel 5:** This output generates the duration portion of the strobe waveform. A pulse is generated after a link from channel 0. You can program the pulse delay and width.

**Channel 6:** This output generates the chopped portion of the strobe waveform. A continuous square wave is generated and synchronized with each link from channel 0. The square wave frequency and duty cycle are programmable.

**Channels 7 and 8:** These outputs control the front panel LEDs. They can be set to high, low, or square wave outputs. The square wave output frequency is programmable.

**Channel 9:** This output is reserved. It has RXD as an input for autodetection of the serial communication parameters.

**Channel 10:** This input is for the ribbon sensor. The channel detects transitions on the input. If it does not receive a transition before it receives a programmable number of links from channel 0, it interrupts the CPU to indicate a ribbon failure.

**Channel 11:** This output generates the refresh requests for the DRAM. It generates a low pulse at a programmable frequency and duration.

**Channel 12:** This input is for the front panel switch. It detects transitions on the input, debounces the switch, and interrupts the CPU.

**Channel 13:** This output generates a square wave of a programmable frequency. It is used to set the current level for the motor driver circuit.

**Channels 14 and 15:** These channels go to J11, and the printer uses them for the cutter signals on the 3400C. TP14 is an output that initiates a cut. TP15 is an input that indicates the cutter's home position. J11 may be reconfigured with jumpers J8 and J9 in the future for other options.

## QSM

The QSM consists of two modules, a Serial Peripheral Interface (SPI) and 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 seven IRQ pins to help facilitate external interrupts in the 3400:

- /I/ORCV, /I/OXMT, /PFAIL, and HF are available as interrupts.

- The IRQ pins are used for general purpose I/O. /I/ORCV and /I/OXMT are used for communications with the I/O option interface.

- For the 3400B, HF is used to indicate that the FIFO needs service.

- /PFAIL indicates a loss of power.

- The 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 32.768KHz crystal provides a reference, allowing the processor to run at frequencies from 131KHz to 16.777MHz. The clock synthesizer is programmed to run at 16MHz in the 3400.

# Memory

The MC68332 has separate address and data busses. 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 128K of battery backed static RAM. The RAM is configured as 128K x 8. The chip select for accessing SRAM should be configured to at least one wait state. The RAM can also be upgraded to 512K x 8 by swapping the component at location U6. For future expansion, the socket for the RAM has been laid out to accept a four Mbit part. In order to implement this feature on the 3400B, the trace on jumper J3 between pins 1 and 2 must be cut and pins 2 and 3 shorted. The 3400C has jumper J3.

### RAM access time:
Processor access time $\geq$ RAM access time
$3 \times CLK \geq Tcslow + Tramaccess + Tsetup + Thc32$
$3 \times 1/16\ MHz \geq 30ns + 120ns + 5ns + 18ns$
$187.5ns \geq 173ns$

## EPROM

The EPROM for the 3400B consists of two 256K x 8 EPROMs configured as 256K x 16. The EPROM for the 3400C consists of two 512K x 8 EPROMs. The EPROMs have an access time of 100ns.

### 3400B EPROM Access Time:
Processor access time $\geq$ EPROM access time
$2 \times CLK \geq Tcslow + Tepromaccess + Tsetup$
$2 \times 1/16\ MHz \geq 30ns + 70ns + 5ns$
$125ns \geq 105ns$

### 3400C EPROM Access Time:
Processor access time (2 waits) $\geq$ EPROM access time
$250ns \geq Tcslow + Tepromaccess + Tsetup$
EPROM access time $\geq 45ns + 150ns + 5ns$
$250ns \geq 200ns$

### DRAM

The 3400B main memory consists of 256K of dynamic RAM. The DRAM is configured as 256K x 8, ICs U25. To support the DRAM interface, GAL U13 and U20 are used to handle refresh and control lines between the DRAM and the processor.

The 3400C is configured to use a 512K x 16 DRAM with the option to use a bigger device. Refresh and control lines are implemented in the CPLD, U23. Four-bit multiplexors are used to generate the row and then the column addresses for the DRAM.

## Communication Interface

The communications interface for the 3400 follows the Intermec Standard Data Connector standard. J1 is a 25 pin D-sub connector that supports both RS-232 and RS-485 interfaces. U1 (U3 on 3400C) is the RS-485 driver/receiver and U2 and U4 (U4 and U5 on the 3400C) 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 PIN 11 signal on the 3400B. This is a slight deviation from previous implementations, but it allows the use of standard cables for hardware flow control. This enables the user to use commands such as the DOS COPY command from any PC. This is consistent with all newer Intermec printers, including the 4100 and the 4400B. Jumper J2 selects the pin 11 function on the 3400C.

## A/D Converter

The TLC5421 converter is an eleven channel, 8-bit, serial A/D converter. The reference is set to +5V. Seven of the eleven 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 TLC5421 converter is continuously communicating with the MC68332 through the SPI. It receives conversion commands and channel addresses while sending back results from the previous command. The clock rate for the TLC5421 is 1 MHz.

# DIP Switches

The 3400 has 16 DIP switches to provide configuration and test and service operation. See Chapter 3 for a complete list of DIP switch settings.

# ASIC and I/O Option Interface

The 3400B uses the Intermec Thermal Compensation ASIC originally designed for the 4400 printer. The 3400C uses enhanced functions, wider buses, and the internal FIFO. 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 the I/O option interfaces were designed to interface with a processor that has multiplexed address and data, it was necessary to multiplex the address and data from the MC68332. The 3400B uses ICs U14 and U15 to route address or data signals. The 3400C uses ICs U12, U13, U16, and U17.

## Chip Select Generation

For the 3400B, GALs U23 and U25 are designed to take the MC68332 bus control signals and convert them into ASIC and I/O option control signals. The 3400C uses the CPLB U23. A state machine governs the timing of the signals and also dictates that the /ASSICCS 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, /OPTIONS and /BOKI/O, are used to select either the board identification number or the data port. XMT and RCV are outputs from the I/O option cards that are inverted and go to the processor to generate communications interrupts.

# FIFO

For the 3400B, the FIFO U11 is the same FIFO used in the 4400 printer. The enhanced ASIC used by the 3400C has an internal FIFO. 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 three lines of data into the FIFO. This causes the HF flag to go HIGH. The ASIC then begins clocking data out of the FIFO. The processor checks each line of the HF flag and loads the next line of data if there is still more image to load. If the image has been completely loaded, the FIFO empties and the /EF flag goes LOW. This tells the ASIC to stop clocking data from the FIFO.

# Front Panel Interface

Connector J15 on the 3400B and the J10 on the 3400C connect to the front panel board. Inputs consist of one button (**[FEED/PAUSE]**) and three LEDs (Power, Alert, and Empty/Pause). The Power LED flashes while the 3400C printer communicates with the host. The Alert LED indicates system errors or printhead over-temperature. The Empty/Pause LED indicates a paused state or a media fault.

The 3400C power LED control comes from the CPLD U23. The LED blinks when the printer is communicating with the host.

# Debug Interface

J5 on the 3400B or J6 on the 3400C 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.

*Original 3400 DRAM Design Parameters*

| Row | Name | Formula | Min | Max | Margin | Comment |
|-----|------|---------|-----|-----|--------|---------|
| 1D | Tclsa | [3,30] | 3 | 30 | | 332 Clk low to sel asserted |
| 2V | Tco | [2,10] | 2 | 10 | | GAL Clk to output delay |
| 3D | Tchav | [2,39] | 2 | 39 | | 332 Clk hi to add valid |
| 4D | Tsy | Tsy | 4 | 12 | | |
| 5C | Trah | [15, ] | 15 | | <13.25> | DRAM row add hold time |
| 6C | Taist | [5, ] | 5 | | <38.50> | 332 DSACK setup time |

*Original 3400 DRAM Design Parameters (continued)*

| Row | Name | Formula | Min | Max | Margin | Comment |
|-----|------|---------|-----|-----|--------|---------|
| 7D | Tclsn | [3,30] | 3 | 30 | | 332 Clk low to sel negated |
| 8D | Tsy | Tsy | 4 | 12 | | |
| 9V | Tpd | [3,15] | 3 | 15 | | Gal Tpd |
| 10C | Tasc | [0, ] | 0 | | <6.25> | DRAM col add setup |
| 11C | Tasr | [0, ] | 0 | | <65.75> | DRAM row add setup |
| 12C | Tras | [80, ] | 80 | | <38> | DRAM ras low time |
| 13C | Tds | [25, ] | 25 | | <18.50> | DRAM |
| 14V | Tsy | [4,12] | 4 | 12 | | Sel to output HC257 |
| 15D | Tpd | Tpd | 3 | 15 | | |
| 16D | Tpd | Tpd | 3 | 15 | | |
| 17D | Tco | Tco | 2 | 10 | | |
| 18D | Tpd | Tpd | 3 | 15 | | |
| 19D | Tco | Tco | 2 | 10 | | |
| 20D | Tpd | Tpd | 3 | 15 | | |
| 21C | Tcas | [20, ] | 20 | | <35.50> | |
| 22D | Tclsa | [3,30] | 3 | 30 | | Same as 1 |
| 23C | Trp | [60, ] | 60 | | <52> | |
| 24C | Tcah | [20, ] | 20 | | <70.75> | |
| 25D | Tco | Tco | 2 | 10 | | |
| 26D | Tpd | Tpd | 3 | 15 | | |
| 27D | Tco | Tco | 2 | 10 | | |
| 28D | Tchav | [2,39] | 2 | 39 | | |
| 29C | Tasr | [0, ] | 0 | | <65.75> | |
| 30D | Tco | Tco | 2 | 10 | | |
| 31C | Trpc | [10, ] | 10 | | <39.50> | |
| 32D | Tco | Tco | 2 | 10 | | |
| 33D | Tco | Tco | 2 | 10 | | |
| 34D | Tclsn | [3,30] | 3 | 30 | | |
| 35D | Tclsa | [3,30] | 3 | 30 | | |
| 36D | Tco | Tco | 2 | 10 | | |
| 37C | Trp | [60, ] | 60 | | <57> | |

3 4 0 0 - 1 0 0



*Timing Diagram*

*DRAM Refresh (3400C)*

## DRAM Access (3400C)

| Analyzer | Waveform MACHINE 1 | Acq. Control | Cancel | Run |

| Accumulate Off | LCS | X -> 1 |  | Center |
| | Binary | 0 -> 0 | | Screen |

| sec/Div 50 ns | Delay 2.272 us | Markers Time | X to 0 4.00 ns | Trig to X -12.00 ns | Trig to 0 -8.00 ns |

```
LCS
HCS
REF
RAS
CASL
CASH
DSACK
ADDSEL
16MCLK
```

*ASIC Access (3400C)*

**5**

# *Troubleshooting*

*This chapter provides some hints for troubleshooting error codes and functional problems you may experience with the printer.*

# About Troubleshooting

Even though the 3400 printer is designed to operate under harsh conditions, you may still encounter error codes at some time. Most of the errors you encounter can be easily fixed and will not delay operation of the printer for very long.

# Troubleshooting Checklist

If you receive an error code or encounter a functional problem with the printer, try the following:

- Check whether the printer sends an error code to the host in response to a <BEL> command.

- If there is an error message, find it in the table under "Error Codes" in this chapter. Follow the instructions after the error message to correct the problem.

- If the printer does not send an error message to the host, try to locate the symptom in the tables under "Printer Operation Problems" in this chapter. Follow the instructions listed after the symptom to correct the problem.

- Clean the printer components and check all connections. See Chapter 2, "Preventive Maintenance," for details.

# Error Handling

This section describes how the 3400 printer handles certain error conditions it may encounter in printer or programming commands.

## Syntax Errors

The 3400 printer responds to syntax errors in the messages it receives from the host by attempting to execute the commands. It does not ignore a command with a syntax error. Instead, the printer produces output, even if it is wrong. This gives you an indication of what went wrong and what should be done to correct the problem.

## *Parameter Errors*

Certain commands require optional parameters. If these parameters are not supplied, default values are substituted. If a parameter is above its maximum range limit, the maximum value is used. If it falls below the minimum range, the minimum value is used. The range and the default value for each command is listed in the *IPL Programming Reference Manual.*

## *Image Overrun Errors*

Image overrun occurs when a label is too complex to image for a given print speed. An overrun will cause the printer to abort the label being printed. This error is most common on labels over 5 inches long.

The printer automatically attempts to correct for this error condition by resetting to the lowest print speed and to the highest number of image bands, and then repeats printing the label. The printer remains at this setting until you reset it. If an image overrun still occurs, printing for that batch of labels stops and any following commands are executed.

## *Invalid Numeric Character Errors*

If nonnumeric characters are included within a numeric data string in a command, the printer disregards them and continues to process the rest of the valid numeric characters. However, if a nonnumeric character begins the numeric data string, the printer uses a default value for the affected command.

Here are two examples of valid numeric character strings and one example of an invalid string:

12a     valid
1a2     valid
a12     invalid

## *Insufficient Storage RAM Errors*

Before storing new formats, graphics, or user-defined fonts in the static RAM, the printer checks to see if it has sufficient memory to store them. If there is insufficient memory, the last editing session is disregarded. The printer is designed to preserve the integrity of the existing data in the static RAM.

## *Error Codes*

Most of the problems you encounter cause the 3400 printer to send an error code to the host. When this happens, find the error code in the following table and follow the instructions to correct the problem.

*Error Codes*

| Error Code | Problem | Solution |
|---|---|---|
| 00 | No error. | |
| 01 | Invalid bar code check character. | Verify the bar code check character modifier used in the bar code program command. |
| 02 | Invalid number of bar code characters (Code UPC/EAN). | Verify the number of bar code characters used in the bar code program command. |
| 04 | Bar code check character within numeric field marks. | Check the bar code program command for accuracy. |
| 05 | Supplemental delimiter within numeric field marks (Code UPC/EAN). | Check the bar code program command for accuracy. |
| 06 | Invalid supplemental character count (Code UPC/EAN). | Check the bar code program command for accuracy. |
| 07 | More than one supplemental delimiter (Code UPC/EAN). | Check the bar code program command for accuracy. |
| 08 | Invalid start/stop characters (Codabar). | Verify start and stop characters in the label format. |
| 11 | Invalid bar code data. | Verify data in the label format. |
| 12 | Data count exceeded. | Data count should not exceed what is specified for the field. |
| 13 | Entering data in nondata entry field. | Check the field for accuracy. |
| 21 | Quantity or batch count out of range. | Quantity of labels or number of batches should be between 1 and 9999. |
| 22 | Field increment/decrement out of range. | Quantity should be between 1 and 9999. |
| 23 | Intercharacter/message delay out of range. | Delay should be between 0 and 9999. |
| 24 | Missing preamble/postamble data. | Delete the setup for preamble or postamble data, or include the data. |
| 25 | Invalid format transmission syntax. | Check the format transmission syntax. The correct syntax is <ESC>x [*n*] with *n* ranging from 0 to 19. |

*Error Codes (continued)*

| Error Code | Problem | Solution |
|---|---|---|
| 26 | Invalid page transmission syntax. | Check the page transmission syntax. The correct syntax is <ESC>y [*n*] with *n* ranging from 0 to 24. |
| 27 | Invalid font transmission syntax. | Check the font transmission syntax. The correct syntax is <ESC>v [*n*] with *n* ranging from 0 to 24. |
| 28 | Invalid UDC transmission syntax. | Check the UDC transmission syntax. The correct syntax is <ESC>u [*n*] with *n* ranging from 0 to 99. |
| 32 | Non-immediate command or data received after buffer full. | Allow the printer to empty the buffer contents before sending commands or data. |
| 33 | Invalid field delimiters. | Check for all pairs of field delimiters and make sure both are numeric or both are alphanumeric. |
| 34 | Invalid escape command. | Correct the escape command syntax. |
| 35 | Invalid data shift command. | Correct the shift command syntax. |
| 36 | Invalid or undefined format number. | Verify that the format numbers are between 0 and 19. |
| 37 | Insufficient room in RAM to print format. | Reduce the number of data fields in the format. |
| 38 | Invalid or undefined field number. | Verify the field number in the label format. |
| 41 | Syntax error for program commands. | Check the program command for proper syntax. |
| 42 | Insufficient room in RAM to store format. | Empty the buffer contents. If the format still does not fit, delete some fields or other data from the format. You may have to remove or reduce the UDCs, format, or fonts if necessary.<br><br>*Note: Entering <ESC>m tells the host how much memory is installed and how much is available.* |

| Error Code | Problem | Solution |
|---|---|---|
| 43 | Too many fields in label format. | You can use up to 200 fields in a format and each field can use up to 250 characters. Reduce field size or delete some fields. |
| 46 | Undefined statement. | Check the statement syntax. |
| 52 | Invalid UDC/UDF bitmap cell height/width or intercharacter space. | Verify that cell heights and widths are between 1 and 599 and that the intercharacter space is between 0 and 199. |
| 53 | Insufficient room in RAM to store UDC or UDF. | Remove or reduce formats, fonts, or UDCs. |
| 54 | Invalid UDC command syntax. | Correct the UDC command syntax. |

# *Printer Operation Problems*

If your printer is not operating correctly, try locating the problem in the table below.

| Symptom | Possible Causes | Solution |
|---|---|---|
| No power or loss of power. | AC power cable is damaged or disconnected. | Make sure the power cable is plugged into both the printer and an outlet or power strip. Replace the printhead cable if it is damaged. See Chapter 6, "Repairing and Replacing," for instructions on replacing the printhead cable. |
| | Printer circuit breaker tripped. | Turn the printer off and then back on again. |
| | Power supply assembly is defective. | Replace it. See Chapter 6 of this manual for instructions on replacing the power supply. |
| Labels stop feeding through the printer. | Printer is out of media. | Load new media. Refer to the *3400, 3440, and 3600 Bar Code Label Printer User's Manual.* |
| | Media is sticking to the paper path. | Clear any extraneous material from the paper path and clean it thoroughly. See Chapter 2 of this manual for cleaning instructions. |
| | Label gap or label mark sensors are dirty. | Clean the label sensors. See Chapter 2 of this manual for cleaning instructions. |

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*Printer Operation Problems (continued)*

| Symptom | Possible Causes | Solution |
|---|---|---|
| The ribbon is wrinkling. | Printhead is out of alignment. | Realign the printhead using the "Printhead Alignment" procedure in Chapter 3 |
| | The outboard plate is out of alignment. | Realign the outboard plate using the "Roller Alignment Procedure" in Chapter 3. |
| Labels stop feeding through the printer. | Printer is set for continuous label stock. | Use the Transmit Configuration Parameters command (<ESC>p) to check the configuration setting. Select the correct setting with the Select Label Stock Type command (<SI>T). Refer to the *IPL Programming Reference Manual.* |
| Printer slows down. | Print speed or image bands are incorrectly set. | Change the image bands or print speed setting. Refer to the *IPL Programming Reference Manual* and the *3400, 3440, and 3600 Bar Code Label Printer User's Manual.* |
| | Printer has aborted and print speed and image bands were reset. | Change the image bands or print speed settings. Refer to the *IPL Programming Reference Manual* and the *3400, 3440, and 3600 Bar Code Label Printer User's Manual.* |
| Labels stick to door or fail to strip. | The self-strip roller is dirty. | Clean the self-strip roller. See Chapter 2, "Preventive Maintenance," for instructions. |
| Configuration label does not print. | The media is loaded incorrectly. | Try reloading the media. See Chapter 2, "Operating the Printer," of the *3400, 3440, and 3600 Bar Code Label Printer User's Manual.* |
| Blotches on labels. | Dirty printhead. | Clean the printhead. Refer to Chapter 2, "Preventive Maintenance," for instructions. |
| | Dirty media path or rollers. | Clean the media path. Refer to Chapter 2, "Preventive Maintenance," for instructions. |
| | Poor quality label or ribbon stock. | Replace stock with Intermec Media Products label or ribbon stock. |

*Printer Operation Problems (continued)*

| Symptom | Possible Causes | Solution |
|---|---|---|
| Printing is too light or too dark. | Dark adjust knob is set incorrectly. | Adjust the knob to achieve the best print quality. See Chapter 3, "Testing and Adjusting," for more information. |
| | Poor quality label or ribbon stock. | Replace stock with Intermec Media Products label or ribbon stock. |
| | The printhead adjustment lever is not positioned correctly. | Reposition the printhead adjustment lever to the default position (vertical). |
| | Sensitivity command is incorrectly set. | Change sensitivity setting to match the type of media you are using. If sensitivity is set correctly, try changing the dark adjust command (<SI>d). |
| Printing is not aligned on label. | Printer is misfeeding media. | Make sure that media is installed properly along the entire media path. See the *3400, 3440, and 3600 Bar Code Label Printer User's Manual.* |
| Labels are not stopping at the right point to be removed. | Label rest point command is incorrectly set. | Adjust the label rest point with the <SI>f command. See the *IPL Programming Reference Manual* for more information. |
| | Printer is set for continuous label stock. | Set the printer to thermal transfer or direct thermal label stock. See the *3400, 3440, and 3600 Bar Code Label Printer User's Manual.* |
| Print quality is poor. | Incorrect media sensitivity. | Change the sensitivity setting to match the type of media you are using. If the sensitivity setting is set correctly, try changing the dark adjust command. See the *IPL Programming Reference Manual* or the *3400, 3440, and 3600 Bar Code Label Printer User's Manual.* |
| | The darkness of label print is too light or too dark. | Properly set the darkness adjust control. See Chapter 3, "Testing and Adjusting," of this manual. |
| | Printhead, platen roller, or label path are dirty. | Clean the printhead, platen roller, and label path as described in Chapter 2, "Preventive Maintenance." |
| | Uneven print contrast (density). | Adjust the bias adjust screw. See Chapter 3, "Testing and Adjusting," of this manual. |
| | Incorrect label or ribbon stock is used to print labels. | Use only Intermec label and ribbon stock to ensure superior print quality and product performance. |
| | Ribbon wrinkling. | Make sure that the ribbon is installed correctly or set the bias adjust screw. |

*Printer Operation Problems (continued)*

| Symptom | Possible Causes | Solution |
|---|---|---|
| Print quality is poor. (continued) | Ribbon installed upside down. | Install the ribbon with the shiny side facing the printhead. See Chapter 2, "Operating the Printer," of the *3400, 3440, and 3600 Bar Code Label Printer User's Manual.* |
| | Direct thermal/thermal transfer switch set in the wrong position. | Set the switch for the type of media you are using. Refer to the back of the printer for the correct DIP switch settings. |
| | Media may be slipping against the platen roller causing the printing to compress. | Switch to approved media or clean the printhead and platen roller as described in Chapter 2, "Preventive Maintenance." |
| | The printhead is installed incorrectly. | Perform the "Printhead Alignment" procedure in Chapter 3. |
| Printer does not print. | Printhead ribbon cables are not properly installed. | Make sure the cables are installed correctly. |
| | Cable not connected between printer and computer. | Make sure the cable is connected at the printer and host computer. |
| | Printer serial port receiver circuitry malfunctioning. | Perform communication self-test as described in Chapter 3, "Testing and Adjusting," of this manual. |
| | Not receiving data. | Make sure the cable is connected to the correct port on the host computer and that the host serial port is configured correctly. Make sure that the baud rate, parity, and stop bits settings are the same on the printer and the host computer. Run the communication test between the host computer and the printer as described in Chapter 3, "Testing and Adjusting," of this manual. |
| | Hardware problem. | Make sure the printer prints the configuration test labels. |
| | | Make sure the cabling on the main PCB, the power supply, and the printhead are connected correctly. |
| | | Make sure the proper media is being used. |

*Printer Operation Problems (continued)*

| Symptom | Possible Causes | Solution |
|---------|-----------------|----------|
| Printer does not print. (continued) | Hardware problem. (continued) | Verify that the printhead is clean and making contact with the media. You may need to change the bias adjust. |
| | | If you cannot locate the problem with the above solutions, replace the components in the following order: |
| | | 1. Printhead. |
| | | 2. Main PCB. |
| Printer does not print from host. | Communication problem. | Verify that the printer configuration and transmission parameters are set correctly. |
| | | Make sure that the printer to host cabling is correct. |
| | | Make sure that the printer communicates by performing the Data Line Print test. See Chapter 3, "Testing and Adjusting," of this manual. |
| | | If all of the above are correct, replace the main PCB. |
| Printed bar code labels cannot be decoded. | Printhead is dirty. | Clean the printhead as described in Chapter 2, "Preventive Maintenance." |
| | Media may be slipping against the platen roller causing the printing to compress. | Try one of the following: |
| | | 1. Switch to approved media. |
| | | 2. Clean the printhead and platen roller as described in Chapter 2 of this manual. |
| | | 3. Tighten/replace the motor shaft gear. |
| | Printhead is defective. | Order and install replacement printhead. |
| | Label stock is defective. | Switch to media that is known to be approved for use in the 3400 printer. |

# Environmental Problems

Symptoms associated with environmental problems are that the printer prints garbage, resets, or locks up. One way to discover if the problem is environmental is to see if the problem goes away when the printer is moved to a new location. If it shows up in a printer recently moved from another area, the problem is probably environmental. Below is a list of different types of environmental problems.

### Electrostatic Discharge (ESD)

ESD can cause failure or weakening of affected components. Typically, ESD occurs when a person with a large electrical potential unintentionally discharges that potential by touching the conductive surfaces of the equipment. Static charge is created through friction from people walking, conveyor belts, paper moving through a printer, and wheelchairs. The solution is to reduce the charge by grounding and by employing prevention measures such as antistatic bags for ICs and PCBs, grounded antistatic mats, antistatic spray for carpeting, antistatic clothing (no wool), antistatic wax for tile floors, conductive floor materials, air ionizers, and antistatic cleaners for plastics. To further protect against ESD, use shielded cable for interface cables, and tie the shield to metal backshells at both ends of the cable. Do not connect the shield of the cable to chassis ground or signal ground of the interface (metal backshells will be tied to the chassis).

### Electromagnetic and Radio Frequency Interference (EMI and RFI)

Noise induced in interface cables can result in the printer receiving false data. This may cause the printer to skip printing a label or lockup. Sources of EMI and RFI are radio transmitters, ignition systems, and relays. To eliminate the effects of EMI and RFI, use low capacitance, twisted pair, shielded cables. Route cables away from sources of EMI and RFI such as large inductive motors or fluorescent lighting ballasts. Do not run cables near AC power lines. If communication cables must run near AC power lines, cross them at 90° angles. Eliminate ground loops; they act as receiving antennas for RFI. Limit the number of breaks (connectors) in the cable. It is possible to use a power line monitor, such as the BMI 4800, to test for noise on the interface cable.

## Ground Loops Between Equipment

Ground loops pick up RFI as well as generate their own noise in interface cables. The recommended wiring of the interface cable calls for connecting chassis ground (pin 1) between the host computer and the printer to ensure that the chassis of both devices remains at the same electrical potential in the event of a faulty ground in either device. This safety precaution will save people from electric shock in the situation where they touch both the host computer and the printer at the same time while there is a faulty ground in either device. With this wiring you would normally expect problems with ground loops, but the printer, chassis ground, and signal ground are connected to each other through a 10kΩ resistor, thus providing some ground loop immunity.

If connections in the interface cable described above are discovered to cause ground loop problems, disconnect the shield from the backshell at only the printer, and sever the chassis ground (pin 1) connection between the host computer and the printer. To ensure safety, double your efforts to guarantee that both the host computer and the printer make a solid electrical and physical connection to earth ground.

## Inadequate Earth Ground

Poor grounds can cause fuses on equipment to blow and damage components. The ground in the AC power receptacle must be a good, solid earth ground. Do not rely on conduit for ground. The ground rod should penetrate the earth at least 8 feet below the frost line. The soil should contain clay minerals; dry, sandy soil does not provide a good ground. Ensure that all ground connections from the service panel to the AC receptacle are solid and secure.

## AC Power Problems (Surges, Sags, Spikes, Noise, and Outages)

Most environmental problems involve the AC power line. In the 3400 printer, 115V supply voltages can range from 90 VAC to 132 VAC. Outside the U.S., 230V supply voltages can range from 180 VAC to 264 VAC. Voltage overages or underages can result from poor utility regulation to in-plant loading of the power service. Use a power line monitor, such as the BMI 4800, to look for power service problems. To eliminate the effects of voltage overages and underages, install an uninterruptible power supply (UPS) or install a dedicated circuit for the printer and the host computer.

Intermittent power outages can be caused by a combination of vibration and loose connections between the service panel and the AC receptacle. Check the wiring to ensure that all connections are solid and secure. Use a power line monitor to test for outages. To eliminate the effects of power outages, install a UPS.

Impulse noise on the power line can also cause the printer to lockup or reset. All Intermec products, including the 3400 printer, can withstand impulses on the power line of 280V maximum. Impulses can range from 200V to 5000V and are caused by lightning, switching operations, firing of SCRs, triacs, static discharge, and arc welders. Use a power line monitor to verify the presence of impulse noise, and use a spike suppressor to eliminate its effect.

Irregular sine waveforms on the AC power line can also affect printer performance. It is caused by switching power supplies. Use a power line monitor to verify the presence of irregular sine waveforms and use a power line conditioner to eliminate their effects.

High frequency noise and hash riding on the AC waveform can affect printer performance. It is caused by transmitters and ignition systems. Use an oscilloscope to verify the presence of noise and hash. Install EMI/RFI filters to eliminate their effects.

**To troubleshoot environmental problems**

1. Correlate an environmental event with the failure.
2. Check for static discharges.
3. Check for adequate grounding.
4. Check the AC power for proper level and purity.
5. Check for inductive motors, relays, or other spike inducing equipment on the power line.
6. Exercise good judgment and common sense.

# 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 aerial communication I/O port. Hardware handshaking involves the use of a hardware wire. Software handshaking involves a two way datalink between the devices. The two devices communicate with each other without losing data through the use of handshaking. The printer sends both forms of handshaking simultaneously when the printer's input buffer is full. Any loss of data can cause printing errors or missing data.

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. The pins are held 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 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 character.

### 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.

# 6

# Repairing and Replacing

*The procedures in this chapter contain detailed instructions on how to replace many parts of the 3400 printer. The replacement procedures start with the easiest to access and move on to the more difficult. The parts or instructions may be different depending on whether you are working on a 3400A, 3400B, or 3400C.*

# 3400 Mechanical Architectural Description

The following is a list of 3400 mechanical features:

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

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

  *Note: The 3400C may not have the self-strip assist roller depending on whether the self-strip option is installed or not.*

- The platen roller, TTR assist roller, and self-strip assist roller are gear driven using 96 tooth gears attached to each roller.

- The self-strip assist roller (sticky roller) and the TTR assist roller use one-way clutches to facilitate label retract. The one-way clutches are part of the rollers' drive gear. The self-strip assist roller has a black gear and the TTR assist roller gear is white. The color difference is to distinguish between the two gears because the clutches lock in opposite directions.

- The ribbon rewind hub and rewinder hub are belt driven. They use a 12 in/oz slip clutch and a one-way clutch that manages take-up force and prevents slackening during retract. The ribbon rewind belt is driven from the TTR assist roller. The ribbon rewind belt is driven from the self-strip assist roller. The self-strip belt is attached in a crossover arrangement so label liner take-up rotation is reversed. This reversed rotation provides a better wrap angle and less slippage on the TTR assist roller as the liner roll increases in size.

- The ribbon 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 and fault indication. The sensor itself is mounted on the main PCB.

- 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. The printhead can be adjusted with a 9/64 inch Allen wrench.

- 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 three steps forward movement of the printhead and three steps backward from center position in 0.006 inch increments (similar to the 4400B). See Chapter 3 for more information on the printhead adjustment lever and aligning the printhead.

# Tools Required for Removal and Replacement

- #1 Phillips screwdriver
- #2 Phillips screwdriver
- Small straight slot screwdriver (like an Intermec screwdriver)
- Medium straight slot screwdriver
- External snap ring pliers
- 9/64 inch Allen wrench
- Spring hook tool (optional)
- #2 Phillips long blade (12-inch) screwdriver (optional)
- Printhead Alignment tool, Part No. T42374
- Roller Alignment tool, Part No. T42389

# Warnings and Cautions

- 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 reassembled.
- When removing the lower belt, make note of the way it is twisted between the two pulleys.

# *Lithium Battery Replacement*

It is necessary to replace the lithium battery when information downloaded to the printer memory is lost after the printer is powered off. This lost data includes changes made to the configuration settings. Configuration settings go back to their factory defaults when power is cycled if the lithium battery is dead. Once the new battery is installed, you must download all of your fonts, formats, pages, and graphics again and make any appropriate changes to the configuration settings. To replace the lithium battery, you need:

- 1.75AH 3.6V AA lithium battery, Part No. 586229S

- Phillips screwdriver

**⚠ WARNING**

**Warning**
*Always disconnect the power cord before opening the PCB cover. Failure to disconnect the power cord may result in injury or death due to electric shock.*

**⚠ CAUTION**

**Caution**
*There is danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type battery recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.*

To replace the lithium battery

1. Switch off the printer power and remove the power cord.

2. Remove the media cover.

3. Remove the six screws that secure the electronics cover to the printer. There are three screws on top and three on the bottom. Lift the electronics cover away from the printer.

4. Remove the lithium battery by pulling it away from the main PCB.

*Replacing the Lithium Battery*

Lithium
Battery

Main PCB

3400-104
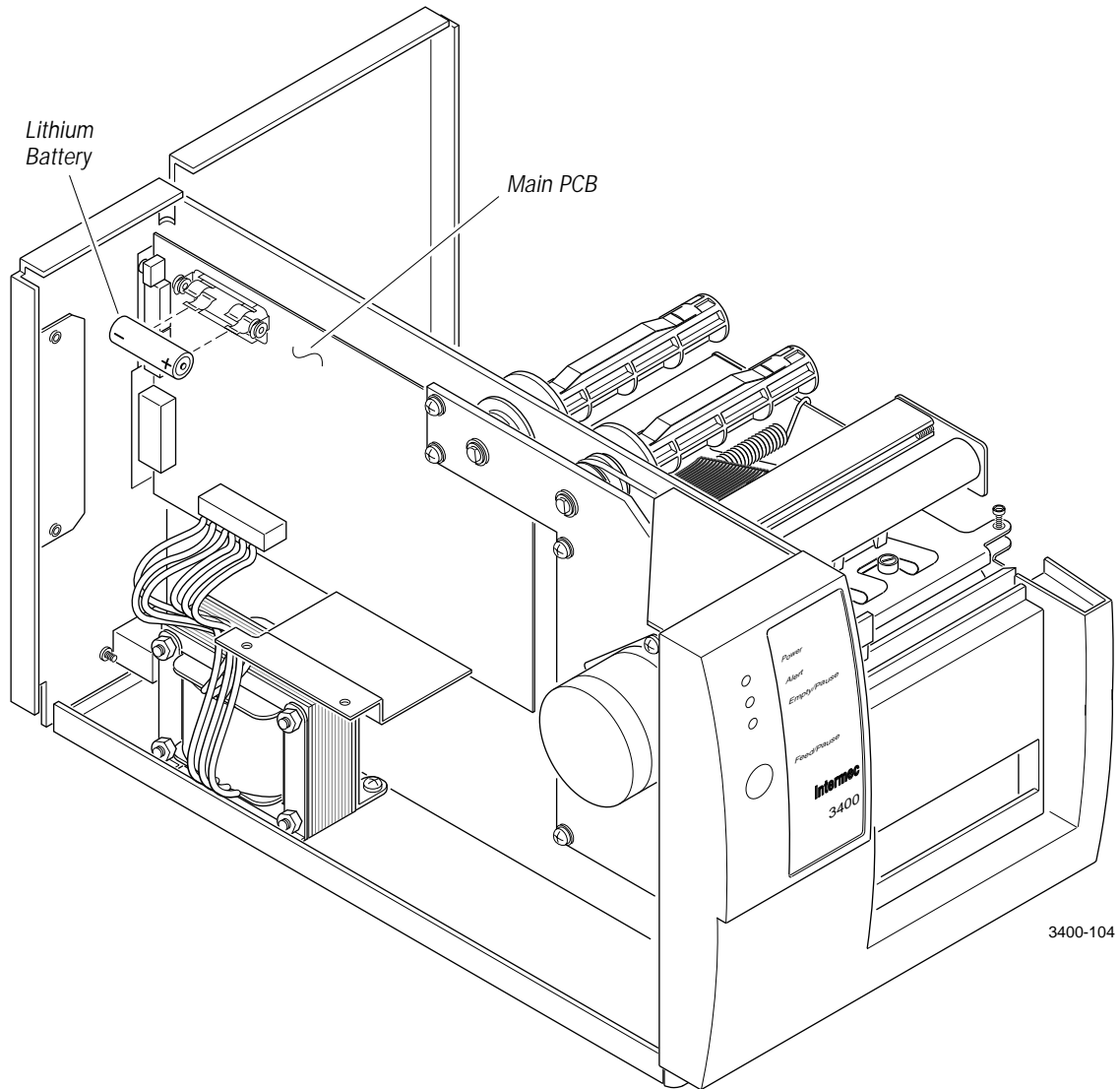
5. To install the new battery, insert the positive end first and then push in on the negative end to secure firmly. Make sure that the plus end of the battery is on the same side as the plus sign on the main board.

6. Replace the electronics cover and secure with the six screws removed in Step 3.

7. Replace the media cover.

8. Install the power cord.

9. Turn on the printer and test for proper operation.

# *Printhead Replacement*

Printhead failure is characterized by the appearance of long white streaks in printed labels. The white streaks are caused by the loss of print bead "dots" on the printhead. To replace the printhead you need:

• 4.09 inch 5 mil printhead, Part No. 059003S-001

• Medium straight slot screwdriver

• #2 Phillips screwdriver

### To replace the printhead

1. Switch off the printer power and remove the power cord.

2. Remove the media cover, raise the head lift lever, and remove any media in the label path.

3. 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.

4. Release the locks on the printhead cable by pressing in on each side of the cable connector. Remove the printhead cable and pull the printhead away from the printer.

   *Note: If you have any problems separating the printhead from the cable, unplug the printhead cable from the Main PCB and pull some of it through the cutout in the printer frame.*

5. Replace the printhead and tighten the printhead retaining screw.

6. Reattach the media cover and install the power cord.

7. Switch the printer power on and check for proper operation.

*Replacing the Printhead*



3400-105
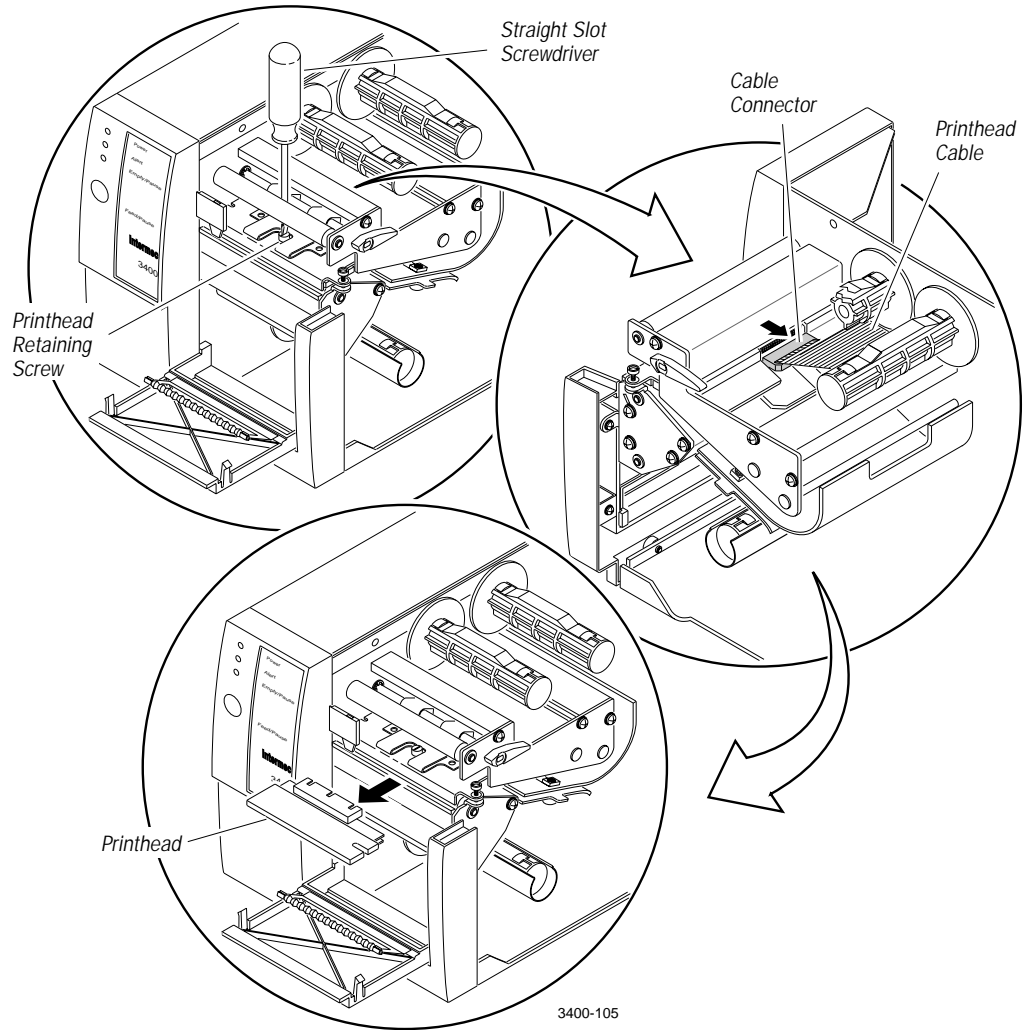
# Bezel PCB Assembly Replacement

If you have problems with the bezel LEDs or the **[FEED/PAUSE]** button working, you may need to replace the bezel PCB assembly. To replace the bezel PCB assembly, you need the following parts:

• Bezel PCB Assembly, Part No. 059052S-002

• #1 Phillips screwdriver

**Caution**
*Integrated circuits on printed circuit boards (PCBs) in this equipment are sensitive to damage by electrostatic discharge (ESD). Prevent ESD by always wearing skin contact ground straps firmly attached to the equipment metal base assembly when working inside of the equipment housing. Failure to comply may result in damage to PCB components.*

**Warning**
*Always disconnect the power cord before replacing the bezel PCB assembly. Failure to disconnect the power cord may result in injury or death due to electric shock.*

To replace the bezel PCB assembly

1. Switch off the printer power and remove the power cord.
2. Remove the media cover and the electronics cover.
3. Unplug the bezel PCB assembly from the main PCB and remove the three screws that hold the front bezel cover to the printer.
4. Lift the front bezel cover away from the printer and lay it on a flat surface.
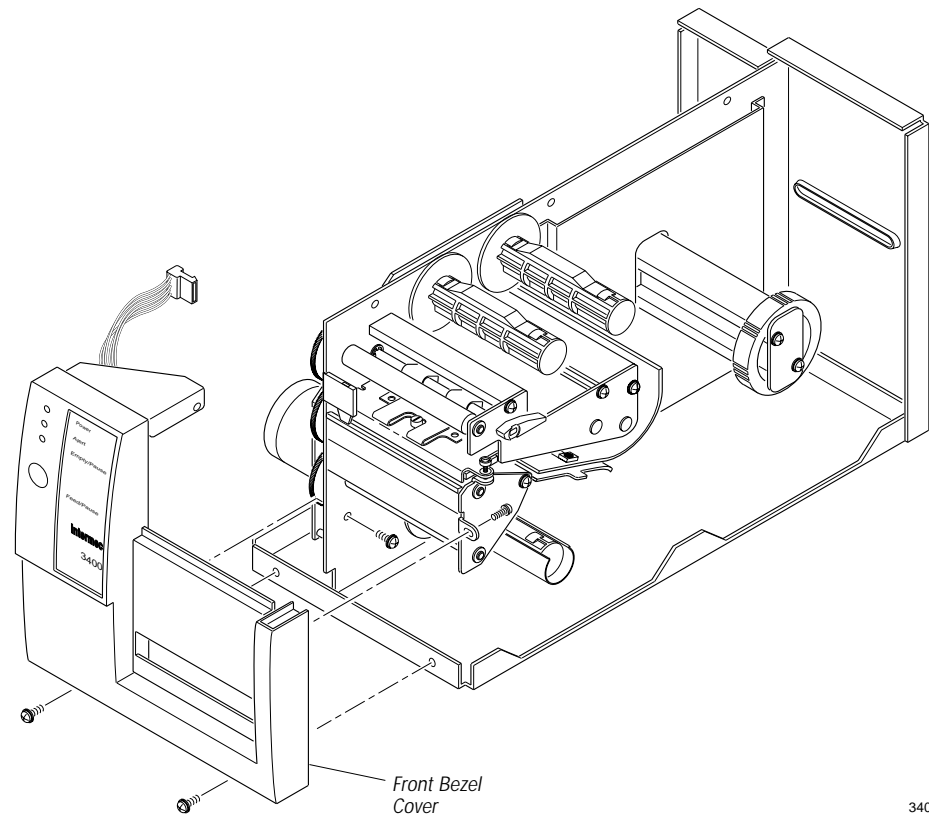
Front Bezel
Cover

3400-1

5.  Using the #1 Phillips screwdriver, remove the two screws that hold the bezel PCB assembly to the front bezel cover.

6.  Pull the bezel PCB assembly away from the front cover plate. You have to pull fairly firmly because the cap button is pressed onto the **[FEED/PAUSE]** switch from the other side of the front bezel cover.



3400-108
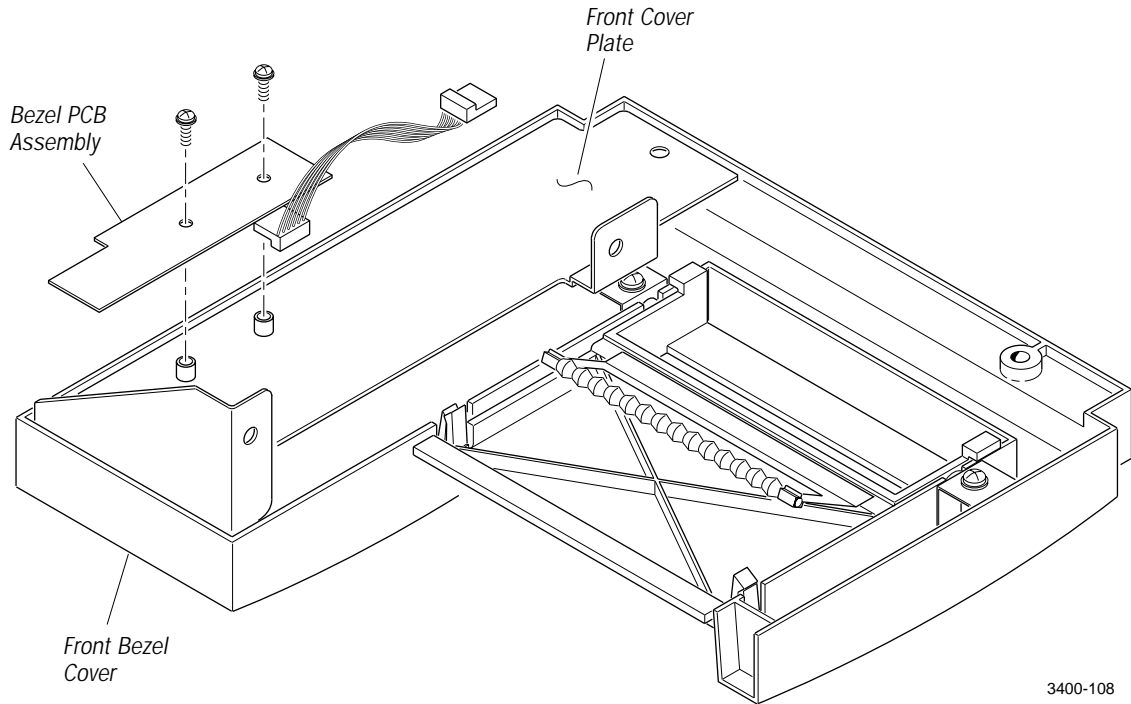
*Note: Be careful not to lose or misplace the cap button.*

7.  Attach the new bezel PCB assembly by repeating the previous steps in reverse order.

8.  To reattach the cap button, simply press it into the **[FEED/PAUSE]** slot in the front side of the front bezel cover.

9.  Reattach all of the printer covers.

10. Install the power cord and switch the printer power on to test for proper operation.

# 3400C Cutter Replacements

If you have problems with the cutter on the 3400C printer, you may need to replace the cutter cover, the cutter cable, the cutter PCB, or the cutter assembly. The following sections explain how to replace the cutter cover, cable, PCB, and assembly.

## Cutter Cover Replacement

To replace the cutter cover, you need the following parts:

- Cutter Cover, Part No. 065591-001
- Straight-slot and Phillips screwdrivers

**To replace the cutter cover**

1. Turn off the printer power and remove the power cord.
2. Using a straight-slot screwdriver, loosen the screw on the top of the cutter.
3. Using a Phillips screwdriver, remove the screws on the base of the cutter.

**illustration of the top screw being loosened and the bottom two screws coming off**

4. Replace the cutter cover with the new cover using the screws from Step 3.
5. Tighten the screw on the top of the cutter to secure the cutter cover.
6. Plug in the power cord and turn on the printer.

## Cutter Cable Replacement

To replace the cutter cable, you need the following parts:

- Cutter Cable, Part No. 066195-001
- Straight-slot and Phillips screwdrivers
- Scissors or wire cutter
- Tie wrap

**⚠ CAUTION**

**Caution**
*Integrated circuits on printed circuit boards (PCBs) in this equipment are sensitive to damage by electrostatic discharge (ESD). Prevent ESD by always wearing skin contact ground straps firmly attached to the equipment metal base assembly when working inside of the equipment housing. Failure to comply may result in damage to PCB components.*

**To replace the cutter cable**

1. Turn off the printer power and remove the power cord.
2. Remove the media cover.
3. Unplug the cutter cable from the printer.
4. Using a straight-slot screwdriver, loosen the screw on the top of the cutter.



44XXU.005
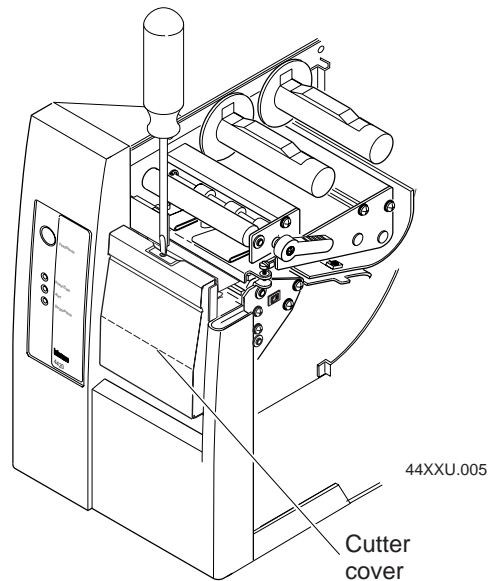
Cutter
cover

5. Using a Phillips screwdriver, remove the screws on the base of the cutter and take off the cutter cover. Retain the screws to replace the cutter cover.

**illustration removing cutter cover**

6. Cut the tie wrap holding the cutter cable to the motor.
7. Unplug the cutter cable from the cutter PCB.

**illustration showing tie wrap coming off and cutter cable coming out of PCB**

8. Plug the new cutter cable in to the cutter PCB.
9. Secure the cutter cable to the motor with a tie wrap, cutting off any excess.
10. Making sure that the cutter cable is flat against the motor, replace and close the cutter cover.
11. Plug the cutter cable in to the printer.

12. Replace the media cover.

13. Plug in the power cord and turn on the printer to test for proper operation.

## Cutter PCB Replacement

To replace the cutter PCB, you need the following parts:

- Cutter PCB, Part No. 066181S-004
- Straight-slot and Phillips screwdrivers

**CAUTION**

**Caution**
*Integrated circuits on printed circuit boards (PCBs) in this equipment are sensitive to damage by electrostatic discharge (ESD). Prevent ESD by always wearing skin contact ground straps firmly attached to the equipment metal base assembly when working inside of the equipment housing. Failure to comply may result in damage to PCB components.*

To replace the cutter PCB

1. Turn off the printer power and remove the power cord.
2. Remove the media cover.
3. Using a straight-slot screwdriver, loosen the screw on the top of the cutter and swing the cutter cover down.
4. Unplug the cutter cable and the motor cable from the cutter PCB.

**illustration of the cutter and motor cables disconnected**

5. Using a Phillips screwdriver, remove the screw on the PCB lock down bracket and take out the PCB lock down bracket. Retain the screw and bracket.
6. Using a Phillips screwdriver, remove the two screws from the cutter PCB and remove the PCB.

**illustration of the PCB lock down bracket and PCB being removed**

7. Attach the new cutter PCB with the screws from Step 7.
8. Replace the PCB lock down bracket.
9. Plug in the cutter cable and the motor cable.
10. With the cutter cover upright, tighten the screw on top of the cutter.
11. Replace the media cover.
12. Plug in the power cord and turn on the printer to test for proper operation.

## *Cutter Assembly Replacement*

To replace the cutter assembly, you need the following parts:

- Cutter Assembly, Part No. 066833S-001
- Phillips screwdriver

**Caution**
***Integrated circuits on printed circuit boards (PCBs) in this equipment are sensitive to damage by electrostatic discharge (ESD). Prevent ESD by always wearing skin contact ground straps firmly attached to the equipment metal base assembly when working inside of the equipment housing. Failure to comply may result in damage to PCB components.***

**To replace the cutter assembly**

1. Turn off the printer power and remove the power cord.
2. Remove the media cover and the electronics cover.
3. Unplug the cutter cable from the printer.
4. Loosen the thumbscrews attaching the cutter to the mounting plate until the cutter comes off the mounting plate.
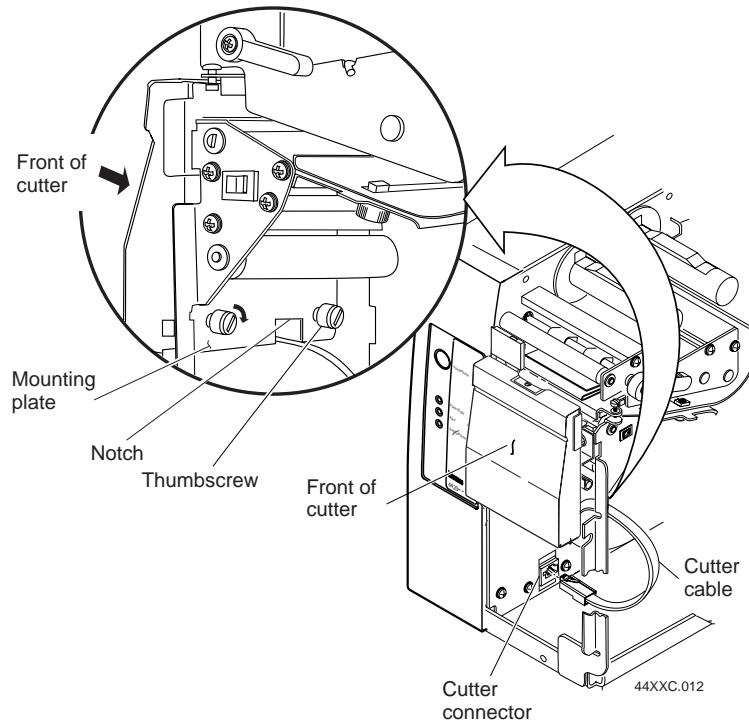


5. Unplug the adapter cable from the PCB.
6. Using a Phillips screwdriver, remove the adapter cable from the printer.

7. Remove the plug in pin 1 of the new adapter cable and attach to the printer and PCB by reversing Steps 3 and 4.



Adapter cable

Connector plate

Main deck

44XXC.006
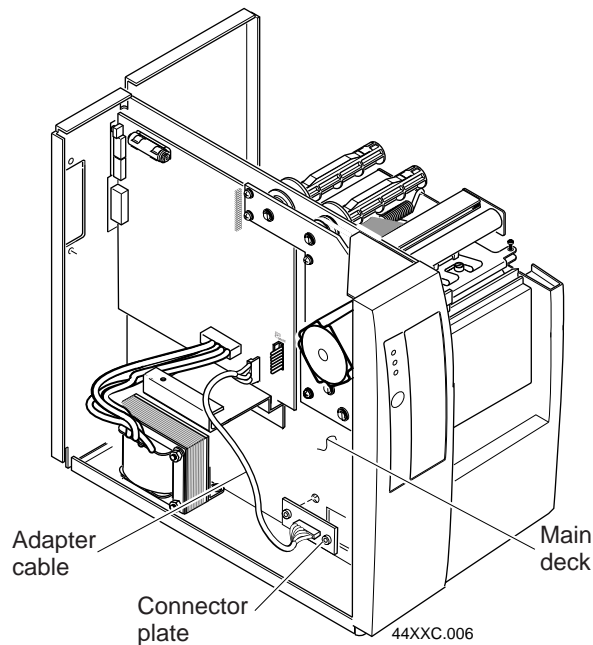
8. Attach the new cutter by reversing Steps 3 and 4.
9. Replace the media cover.
10. Install the power cord and turn on the printer to test for proper operation.

## Main PCB Assembly Replacement

Problems with printer-to-computer communications, motor control, or media advance may be caused by a faulty main PCB assembly. To replace the main PCB assembly, you need the following items:

- 3400A main PCB assembly, Part No. 059050S-013
- 3400B main PCB assembly, Part No. 060538S-010
- 3400C main PCB assembly, Part No. 066070S-003
- #2 Phillips screwdriver

**Caution**
*Integrated circuits on printed circuit boards (PCBs) in this equipment are sensitive to damage by electrostatic discharge (ESD). Prevent ESD by always wearing skin contact ground straps firmly attached to the equipment metal base assembly when working inside of the equipment housing. Failure to comply may result in damage to PCB components.*

**Warning**
*Always disconnect the power cord before replacing the main PCB assembly. Failure to disconnect the power cord may result in injury or death due to electric shock.*

To replace the main PCB assembly

1.  Switch off the printer power and remove the power cord.

2.  Remove the media cover and the electronics cover. Place the printer on its side with the electronics side facing up.

3.  Unplug all of the cables from the main PCB and remove the seven screws securing the main PCB to the printer.

    *Note: Both the cable connectors and the main PCB are labeled with the cable name. This makes it easy for you to reattach cables to the new main board.*

*Replacing the Main PCB Assembly*
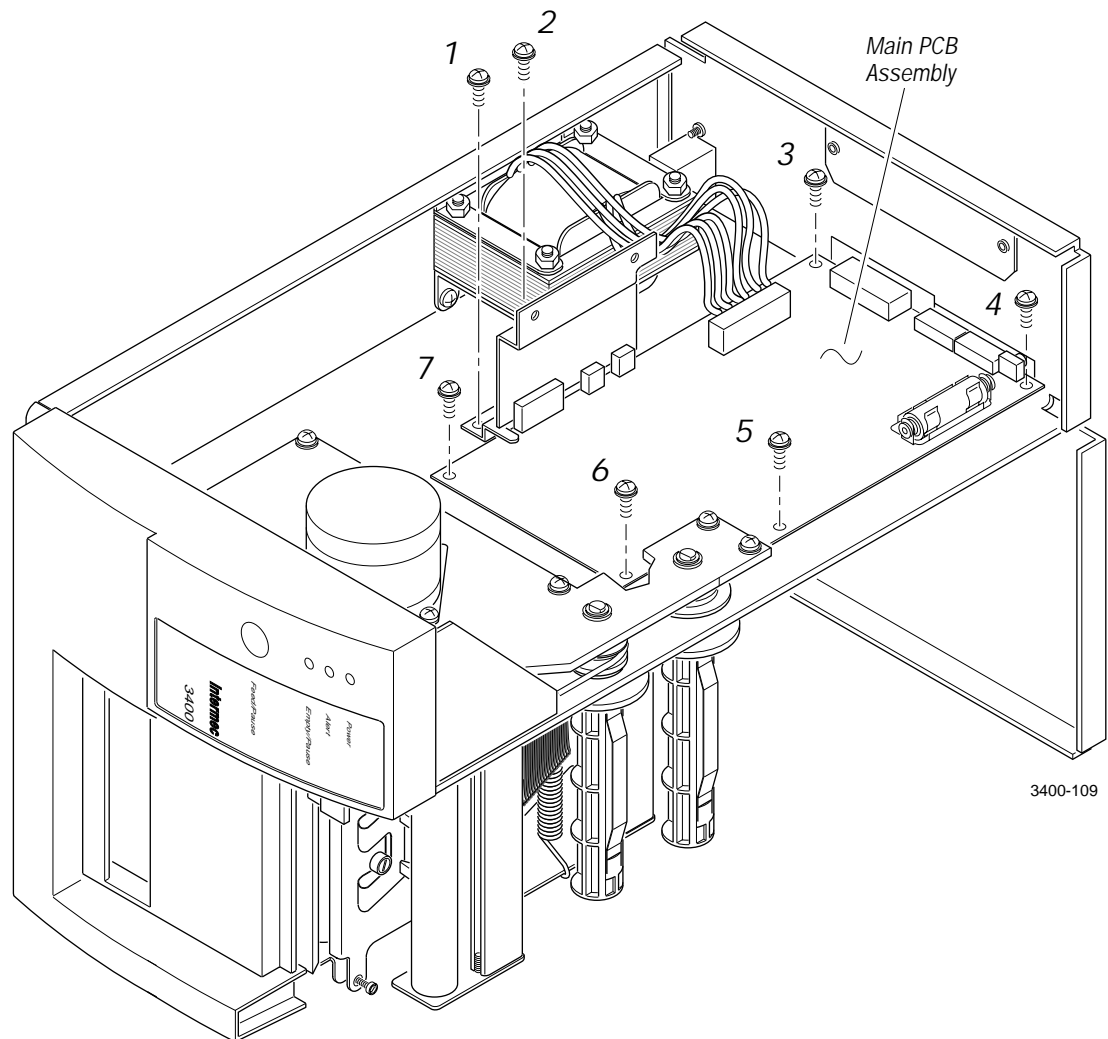


*Main PCB Assembly*

3400-109

4. Remove the main PCB and replace it with the new PCB assembly.

5. Replace the seven screws removed in Step 2 and reattach all of the cables. Set the printer back in its upright position.

6. Replace the electronics cover and the media cover.

7. Install the power cord and switch the power on to test for proper operation.

# Memory Expansion Card Replacement

If your Kanji fonts do not print, you may need to replace the memory expansion card.

To replace the memory expansion card, you need the following parts:

- 3400 memory expansion card assembly, Part No. 067396S-001 for the 8M memory card, 061485S-001 for the 6M memory card, or 061486S-001 for the 2M memory card

- #2 Phillips screwdriver

**Caution**
*Integrated circuits on printed circuit boards (PCBs) in this equipment are sensitive to damage by electrostatic discharge (ESD). Prevent ESD by always wearing skin contact ground straps firmly attached to the equipment metal base assembly when working inside of the equipment housing. Failure to comply may result in damage to PCB components.*

**Warning**
*Always disconnect the power cord before replacing the memory expansion card. Failure to disconnect the power cord may result in injury or death due to electric shock.*

To replace the memory expansion card assembly

1. Switch off the printer power and remove the power cord.

2. Remove the media cover.

3. Remove the six screws that secure the electronics cover to the printer, three on the top and three on the bottom. Lift the electronics cover away from the printer.

4. Remove the three screws that hold the memory expansion card to the main PCB.

   *Note: You may need to use your fingers to hold the stacking spacer on the bottom of the memory expansion card while you remove the screw.*

5. Carefully rock the memory expansion card while pulling it away from the main PCB to disconnect connectors J1 and J2.

6. Replace the memory expansion card with the new one. Make sure the new memory expansion card is fully seated before replacing the screws. Refer to the illustration on the next page.

7. Replace the electronics cover and the media cover.

8. Install the power cord and switch the power on to test for proper operation.

PCB Corner
Edge Spacer

Main PCB
Assembly

Hex Standoff

PCB Stacking
Spacer

Plug the J1 connector
on the memory
expansion card into
J2 of the main PCB
assembly.

6-20 x .312
Phillips Screw

8-32 x .38
Phillips Screw

J2

Memory Expansion
Card

6-32 x .375
Phillips Screw

3400-072
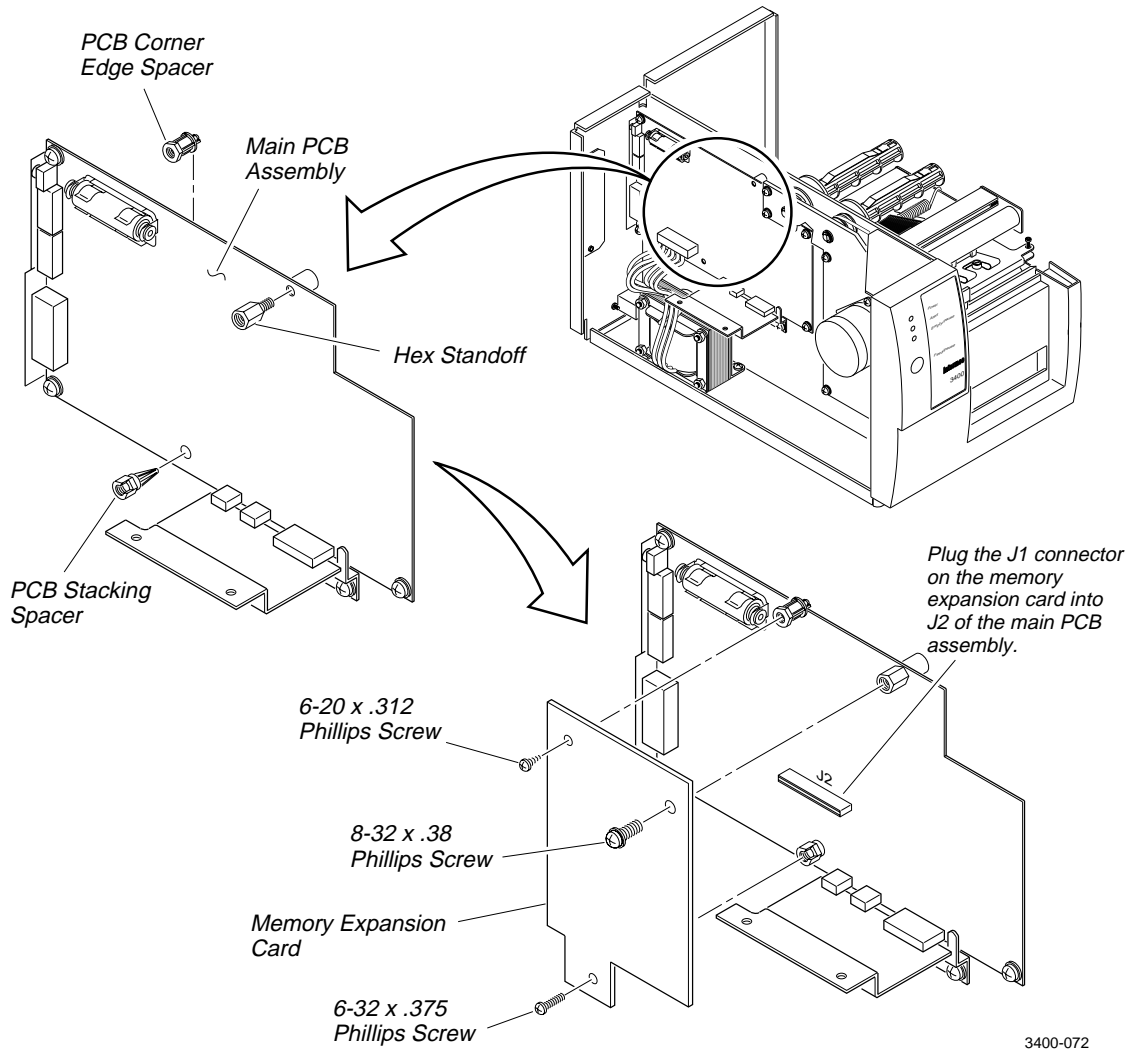
# *Label Mark Sensor Replacement*

If the printer is no longer registering the use of marked label stock, you may need to replace the label mark sensor. The required parts and tools are listed below:

- Label mark sensor assembly, Part No. 059729-003

- #2 Phillips screwdriver

**To replace the label mark sensor**

1. Switch off printer power and remove the power cord.

2. Remove the media cover, the electronics cover, and the front bezel cover. Disconnect the mark sensor connector from the main PCB.

3. Remove the four Phillips screws that secure the lower outboard plate to the printer and pull it away from the printer. Retain the tear bar and the tear bar support that are secured by this plate.



*Lower Outboard Plate*

*Tear Bar*

*Tear Bar Support*

3400-118

*Replacing the Label Mark Sensor*



Label Mark
Sensor

3400-111
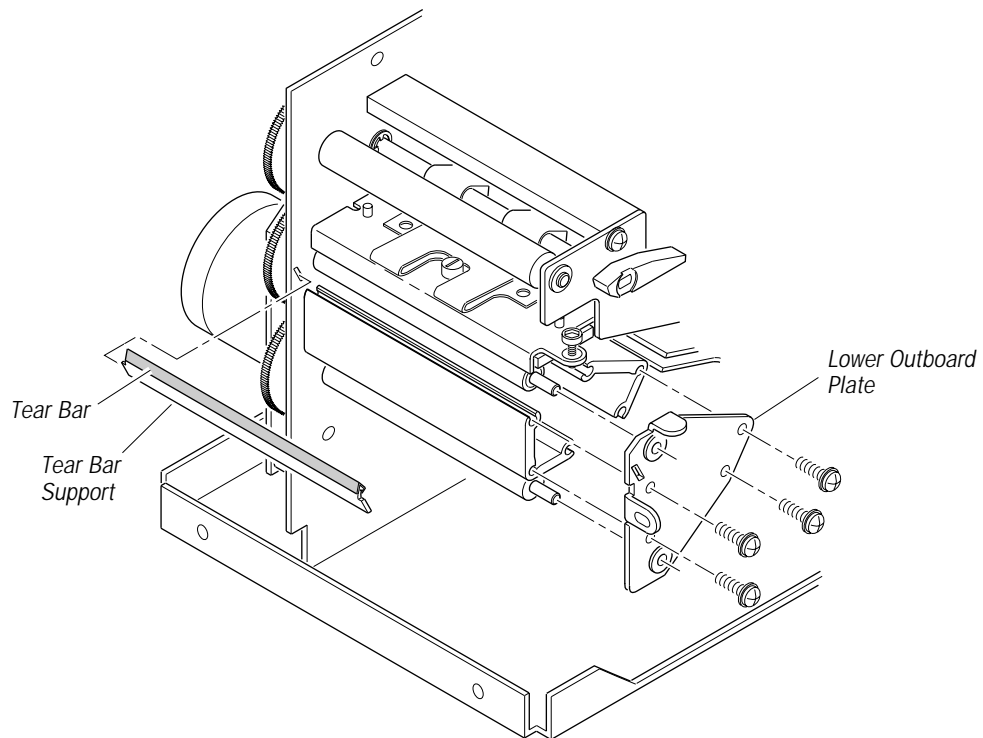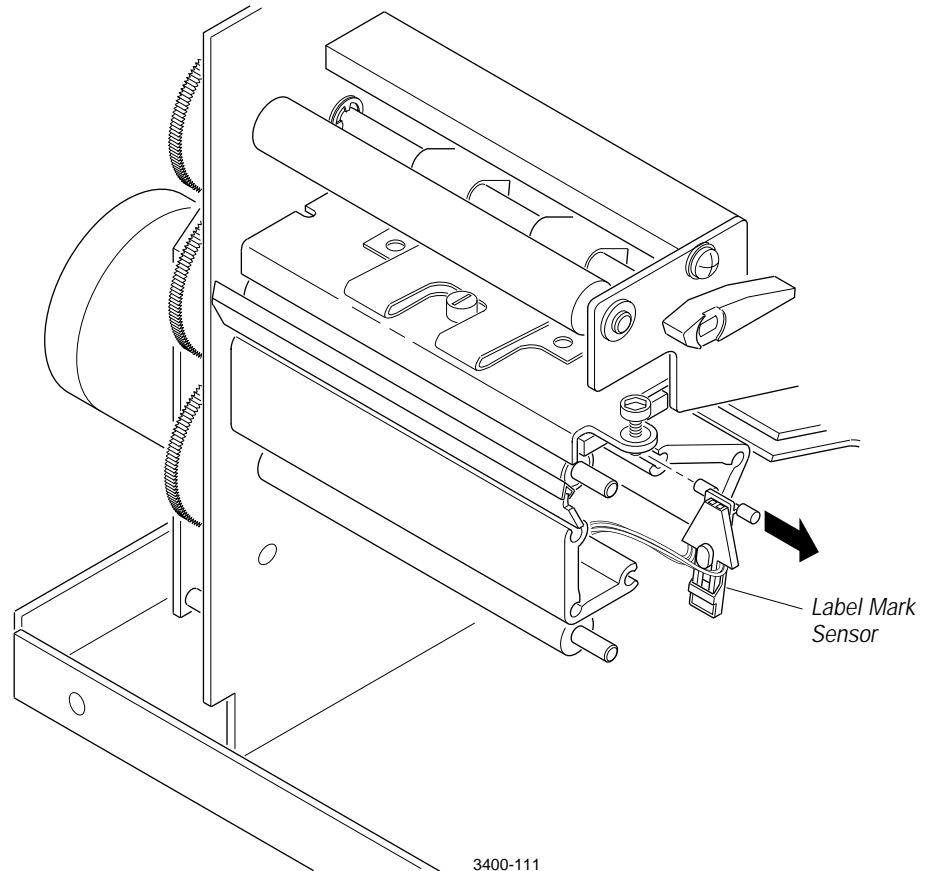
4. Disconnect the label mark sensor cable from the main PCB and push it through the cutout in the printer frame. Slide the sensor out from the extrusion.

5. Insert the new label mark sensor into the extrusion. Route the cable through the cutout in the printer frame and plug it into the main PCB. Secure the cable in place by inserting it into the two cable clips.

   **Note:** *Ensure that the cable is secured and not making contact with gears, belts, etc.*

   **Note:** *Remember to replace the tear bar and support when reinstalling the outboard plate.*

6.  Replace the lower outboard plate and replace the four Phillips screws removed in Step 4.

    *Note: Use the roller alignment tool, Part No. T42389, during reassembly for proper alignment of the outboard plate. See the "Roller Alignment Procedure" in Chapter 3.*

7.  Replace all of the printer covers.

8.  Install the power cord and switch the power on to test for proper operation.

# Label Taken Sensor Replacement

If your printer is no longer sensing when labels have been removed, it may be time to replace the label taken sensor. To replace the label taken sensor, you need the following items:

*   Label taken sensor, Part No. 059496-004

*   #2 Phillips screwdriver

**To replace the label taken sensor**

1.  Switch off printer power and remove the power cord.

2.  Remove the media cover, the electronics cover, and the front bezel cover.

3.  Disconnect the label taken sensor cable from the main PCB and push it through the cutout in the printer frame.

4.  Slide the label taken sensor housing from the printer frame.

5.  Insert the new sensor into the printer frame.

6.  Route the cable through the cutout in the printer frame and plug it into the main PCB. Clip the cable into the cable clamps.

    *Note: Ensure that the cable is secured and not making contact with any gears, belts, etc.*

7.  Replace all of the printer covers.

8.  Install the power cord and switch the power on to test for proper operation.

*Replacing the Label Taken Sensor*

Printer
Frame

Label Taken
Sensor

3400-112
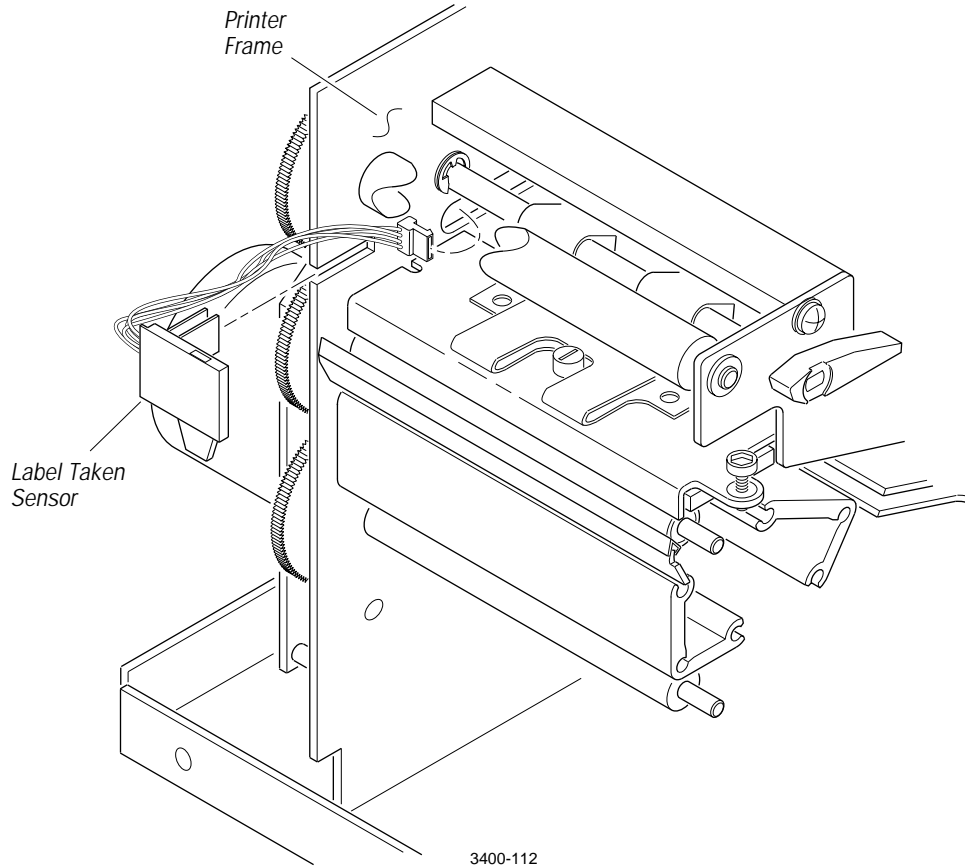
# Label Gap Sensor Replacement

If labels are not stopping at the right point to be removed, or they stop indexing, you may need to replace the label gap sensor. Before you replace the label gap sensor, try adjusting the darkness adjust control. If you still have problems, you need to replace the label gap sensor. To replace the label gap sensor, you need:

- Label gap cable assembly, Part No. 059495-002
- Small straight slot screwdriver
- 12-inch #2 Phillips long blade screwdriver

**To replace the label gap sensor**

1. Switch off printer power and remove the power cord.
2. Remove the label supply cover and the electronics cover.
3. Disconnect the label gap sensor cable from the main PCB.
4. Remove the three screws that hold the media guide assembly and remove the media guide assembly from the printer. Be careful when pulling the label gap sensor cable through the cutout in the printer frame.

*Removing the Media Guide*



Gap Sensor
Cable

Label Gap
Sensor

Upper Media
Guide

3400-113
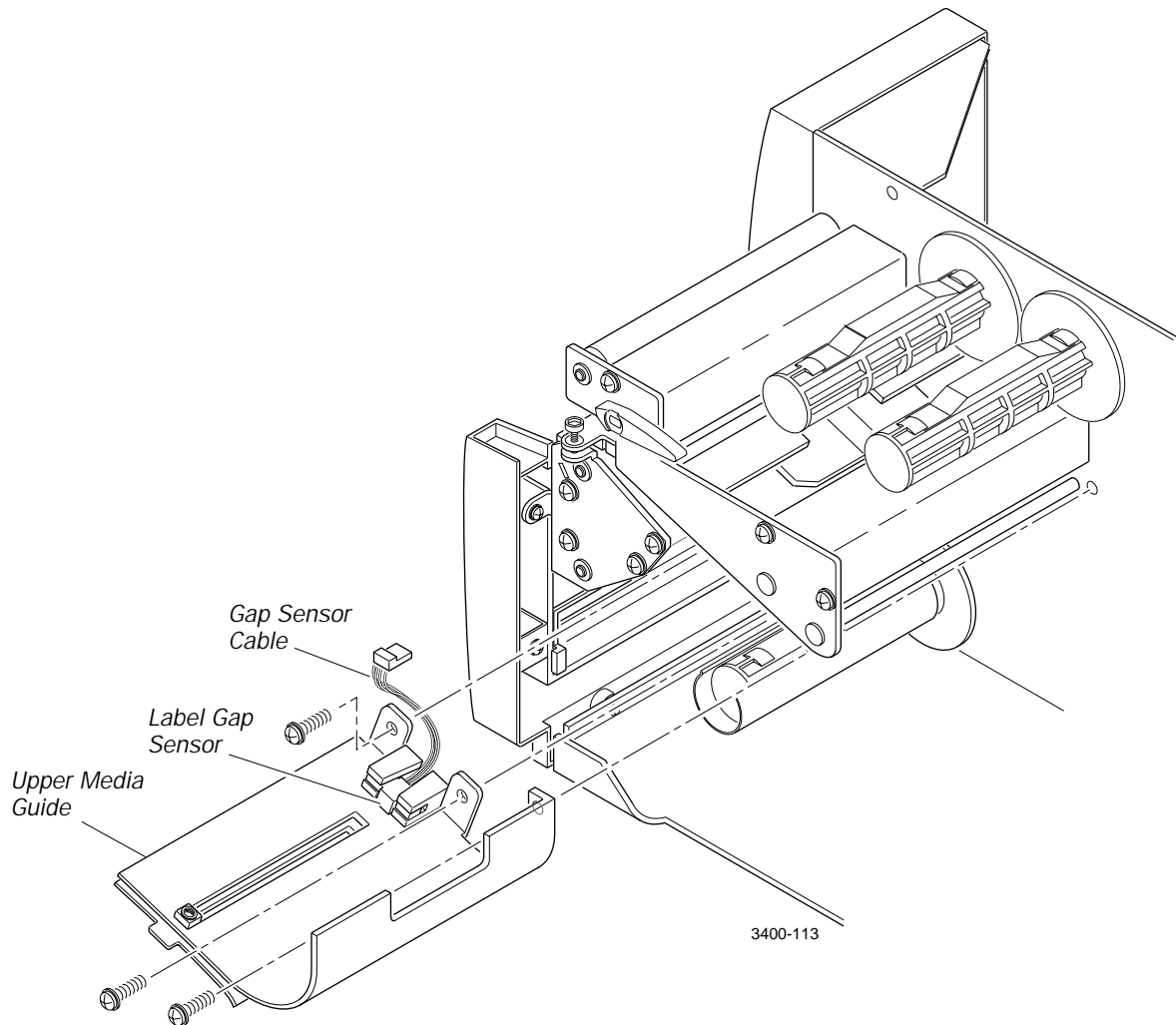
5.  Slide the upper media guide outward to separate it from the rest of the assembly.

6.  Use a small straight slot screwdriver to lift up on each of the two molded tabs that secure the label gap sensor. Slide the label gap sensor from its housing and replace it with the new label gap sensor. The label gap sensor should "snap" into place.

*Replacing the Label Gap Sensor*

*Label Gap Sensor*
*(Use a small straight slot screwdriver to slide the sensor from the housing.)*

*Lower Media Guide*

*Label Gap Sensor Housing*

*Locking Tabs*

*Upper Media Guide*

*Lift Spring*
*(Must be under the lower media guide.)*

3400-114
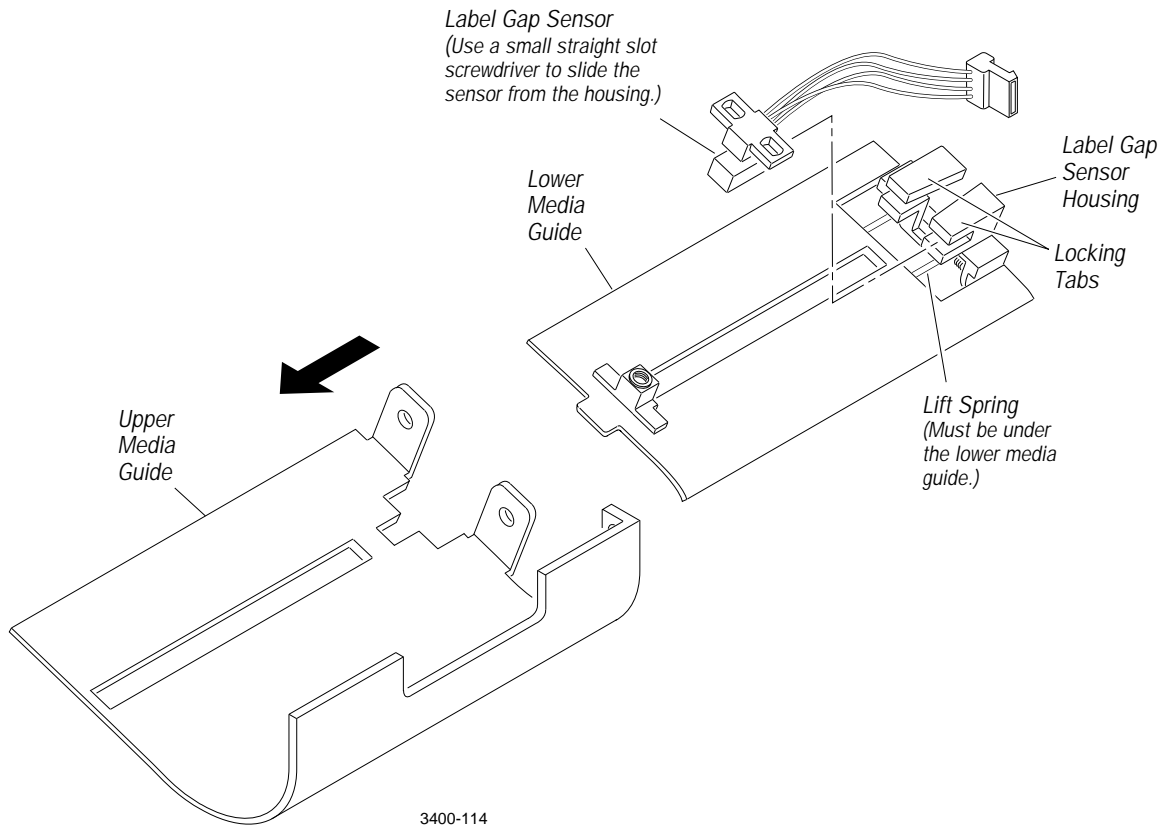
7. Slide the upper media guide back together with the lower media guide. Be sure that the lift spring is positioned under the lower media guide.

8. Route the label gap sensor cable through the cutout in the printer frame and reattach the media guide assembly to the frame with the three Phillips screws removed in Step 4.

9. Attach the label gap sensor cable to the main PCB.

10. Reattach all of the printer covers and install the power cord. Switch the printer power on and test for proper operation.

# *TTR Assist Gear Replacement*

If the TTR assist gear assembly is damaged, replace it by using the following parts:

- TTR assist gear/pulley assembly, Part No. 059044-007
- E-ring pliers
- #2 Phillips screwdriver

### To replace the TTR assist gear

1. Switch off printer power and remove the power cord.

2. Remove the media cover, the electronics cover, and the front bezel cover.

3. Remove the TTR assist gear e-ring located on the electronics side of the printer. Retain the washer located between the e-ring and the TTR assist gear/pulley.

4. Remove the belt from the gear/pulley assembly. Slide the gear/pulley assembly away from the printer and off of the TTR roller shaft. Ensure that you retain the washer located between the gear/pulley and the printer frame.

   *Note: Do not remove the motor plate. Changing the position of the motor plate destroys factory alignment and may cause ribbon wrinkling.*

5. Insert the new TTR assist gear/pulley assembly by first sliding the gear/pulley assembly onto the TTR assist roller shaft and then reinstalling the belt.

   *Note: Remember to replace the washer removed in Step 4.*

6. Replace the e-ring and washer removed in Step 3.

7. Replace the printer covers.

8. Install the power cord and switch the power on to test for proper operation.

*Replacing the TTR Assist Gear*



Upper Drive Belt

Upper Drive Belt

TTR Roller Shaft

Washer

E-ring

TTR Assist Gear/Pulley

Washer

Motor Plate

TTR Assist Gear/Pulley
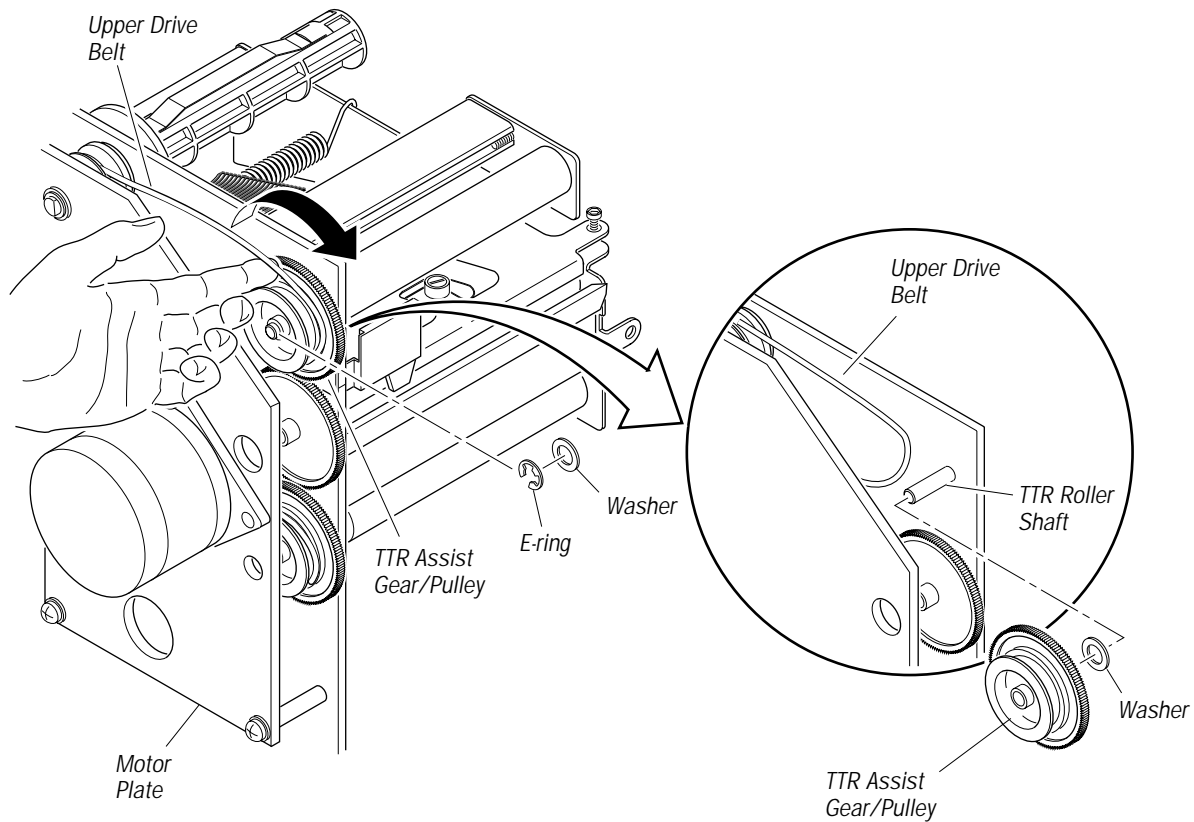
3400-115

# Upper Drive Belt and Ribbon Rewind Clutch Pulley Replacement

If the upper drive belt wears out or you need to replace the clutch pulley on the ribbon rewind hub, replace them by using the following parts:

- Take-up clutch pulley, Part No. 059689S-008

- 2.734ID x .139 drive belt, Part No. 501462-002

- Snap ring pliers

- #2 Phillips screwdriver

**To replace the upper drive belt and ribbon rewind clutch pulley**

1. Switch off printer power and remove the power cord.

2. Remove the media supply cover, the electronics cover, and the front bezel cover.

3. Remove the ribbon rewind clutch pulley snap ring and the thick washer from the end of the ribbon rewind hub shaft.



*Thin Washer*

*Ribbon Rewind Hub Assembly*

*Thick Washer*

*Snap Ring*

*Upper Drive Belt*

*Clutch Pulley*

*TTR Assist Gear/Pulley*

3400-116
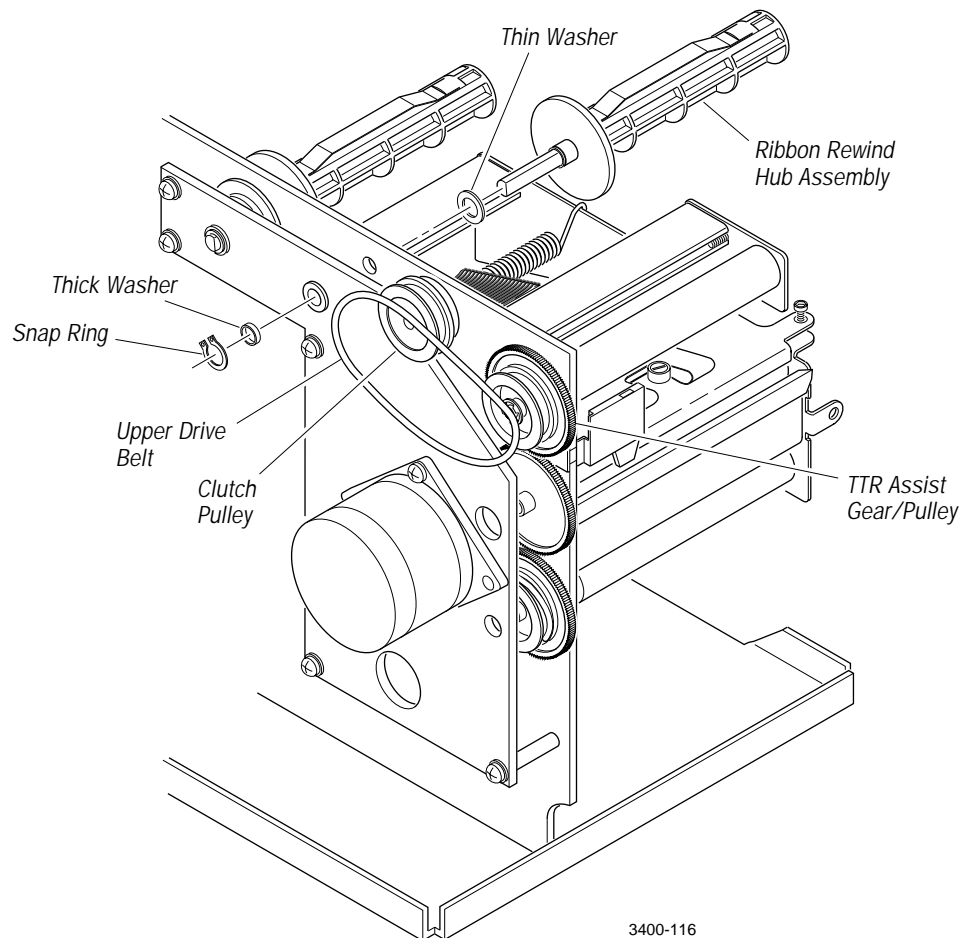
4. Pull out on the ribbon rewind hub assembly to release the clutch pulley.

5. Lift the ribbon rewind clutch pulley and upper drive belt away from the printer.

   *Note: Do not remove the motor plate. Changing the position of the motor plate destroys factory alignment and may cause ribbon wrinkling.*

6. Replace the upper drive belt or the ribbon rewind clutch pulley.

   *Note: Now is a good time to replace the ribbon rewind hub if necessary.*

7. Wrap the upper drive belt around the ribbon rewind clutch pulley assembly and position it so that the ribbon rewind shaft can be inserted through it. Replace the ribbon rewind hub.

8. Replace the thick washer and snap ring removed in Step 3. Reinstall the drive belt over the TTR assist gear/pulley.

9. Replace all of the printer covers.

10. Install the power cord and switch the power on to test for proper operation.

# TTR Clutch Encoder Replacement

If you need to replace the TTR clutch encoder or ribbon supply hub, use the following parts:

- TTR clutch encoder, Part No. 059114S-007

- Ribbon supply hub assembly, Part No. 059043-006

- Snap ring pliers

**To replace the TTR clutch encoder**

1. Switch off printer power and remove the power cord.

2. Remove the media supply cover, the electronics cover, and the front bezel cover.

3. Remove the snap ring and thin washer from the electronics side of the ribbon supply hub shaft.

4. Pull the ribbon supply hub away from the printer on the media side to release the TTR clutch encoder.

5. Replace either the clutch encoder or the ribbon supply hub.

6. Align the TTR clutch encoder with the opening in the printer frame and slide the ribbon supply hub back through the clutch encoder and the motor plate. Ensure that the flat side of the supply hub shaft is aligned with the TTR clutch encoder.

   *Note: Do not remove the motor plate. Changing the position of the motor plate destroys factory alignment and may cause ribbon wrinkling.*

*Replacing the TTR Clutch Encoder*



Thick Washer

TTR Clutch Encoder

Ribbon Supply Hub

Thin Washer

Snap Ring

TTR Assist Gear/Pulley

3400-117
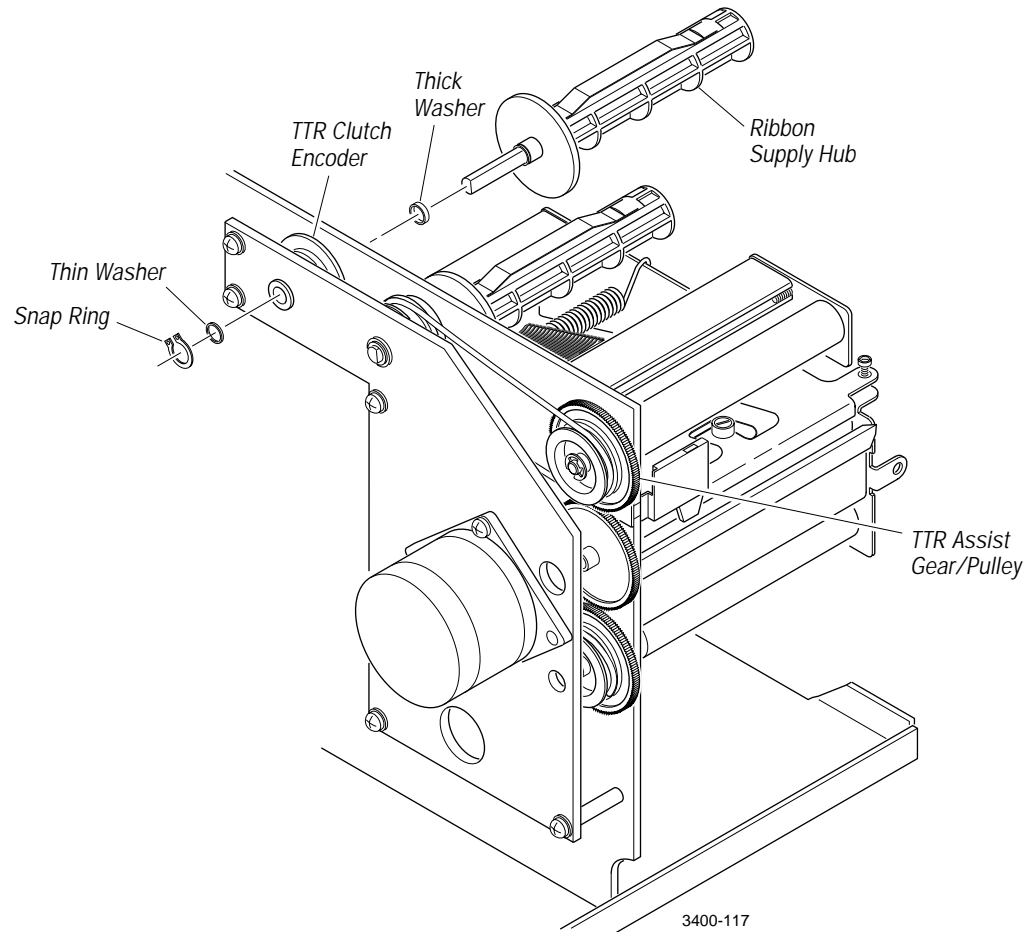
7. Replace the thin washer and snap ring removed in Step 3.

8. Replace all of the printer covers.

9. Install the power cord and switch the power on to test for proper operation.

# Lower Drive Belt Replacement

If the lower drive belt wears out or any of the lower gears or rollers need to be replaced, you need some or all of the following parts:

- 2.734ID x .139 drive belt, Part No. 501462-002
- #2 Phillips screwdriver
- Snap ring pliers
- Self-strip assist gear/pulley assembly, Part No. 059511-005

   *Note: Self-strip is an option on the 3400C.*

- Rewinder hub clutch pulley, Part No. 059689S-008
- Rewinder hub, Part No. 059043-006
- Platen roller, Part No. 058996-009
- Platen roller gear, Part No. 059028-007

**To replace the lower drive belt**

1. Switch off printer power and remove the power cord.
2. Remove the media cover, the electronics cover, and the front bezel cover.
3. Remove the snap ring and the thin washer from the rewinder hub shaft on the electronics side of the printer.
4. Remove the rewinder hub to free the rewinder hub pulley that the lower drive belt wraps around.
5. Slide the rewinder hub pulley forward and remove it from behind the motor plate. Unloop the drive belt from the rewinder hub pulley and the self-strip assist roller gear/pulley.

   *Note: At this point, you can replace the rewinder hub clutch pulley or the rewinder hub.*

   *Note: Do not remove the motor plate. Changing the position of the motor plate destroys factory alignment and may cause ribbon wrinkling.*

*Replacing the Lower Drive Belt*



Thin Washer

Snap Ring

Rewinder Hub

Thick Washer

Self-strip
Assist Roller
Gear/Pulley

Lower
Drive
Belt

Lower Drive
Belt

Spring Drive
Guard

Rewinder
Hub Pulley
(Slide the pulley
forward. Remove
the pulley from
behind the motor
mount plate and
unloop the belt from
the two gear/pulleys.)

Metal Tab

The lower drive
belt must be reinstalled
with the front loop of the
belt in front of the the metal
tab on the spring drive guard.

Motor
Plate

3400-119

*Note: When reassembling the belt, remember that the belt has a twist between pulleys. The belt must be reinstalled with the front loop of the belt in front of the metal tab on the spring drive guard. The twist in the lower belt provides for rewinder hub rotation opposite that of the upper drive belt pulley.*

6.  Loop one end of the drive belt around the self-strip assist roller gear/pulley and place the other end around the rewinder hub pulley.

7. Reinsert the rewinder hub pulley into the space behind the motor plate, making sure that the drive belt is placed correctly around the spring drive guard.

8. Replace the rewinder hub. Inserting the rewinder hub through the rewinder hub pulley may take some patience because you need to maintain tension on the self-strip assist gear/pulley and lower drive belt while positioning the rewinder hub pulley in place. Use the cutout in the motor plate to help position the clutch pulley.

9. Replace the washer and snap ring removed in Step 3.

10. Reattach all of the printer covers.

11. Install the power cord and switch the printer power on to test for proper operation.

# Platen Roller and Platen Roller Gear Replacement

If the platen roller needs to be replaced, you need some or all of the following parts:

• Platen roller, Part No. 058996-009

• Platen roller gear, Part No. 059028-007

• #2 Phillips screwdriver

• Snap ring pliers

**To replace the platen roller and the platen roller gear**

1. Switch off printer power and remove the power cord.

2. Remove the media cover, the electronics cover, and the front bezel cover.

3. Remove the snap ring that holds the platen roller gear in place.

4. Remove the four screws that secure the lower outboard plate to the printer frame. Lift the plate away from the printer. The tear bar and support become loose when the outboard plate is removed; be sure to place it in a safe place.

5. Loosen the motor mounting screws.

6. Replace either the platen roller or the platen roller gear, washer, and e-ring, and secure with the snap ring removed in Step 3.

*Replacing the Platen Roller and the Platen Roller Gear*



3400-110
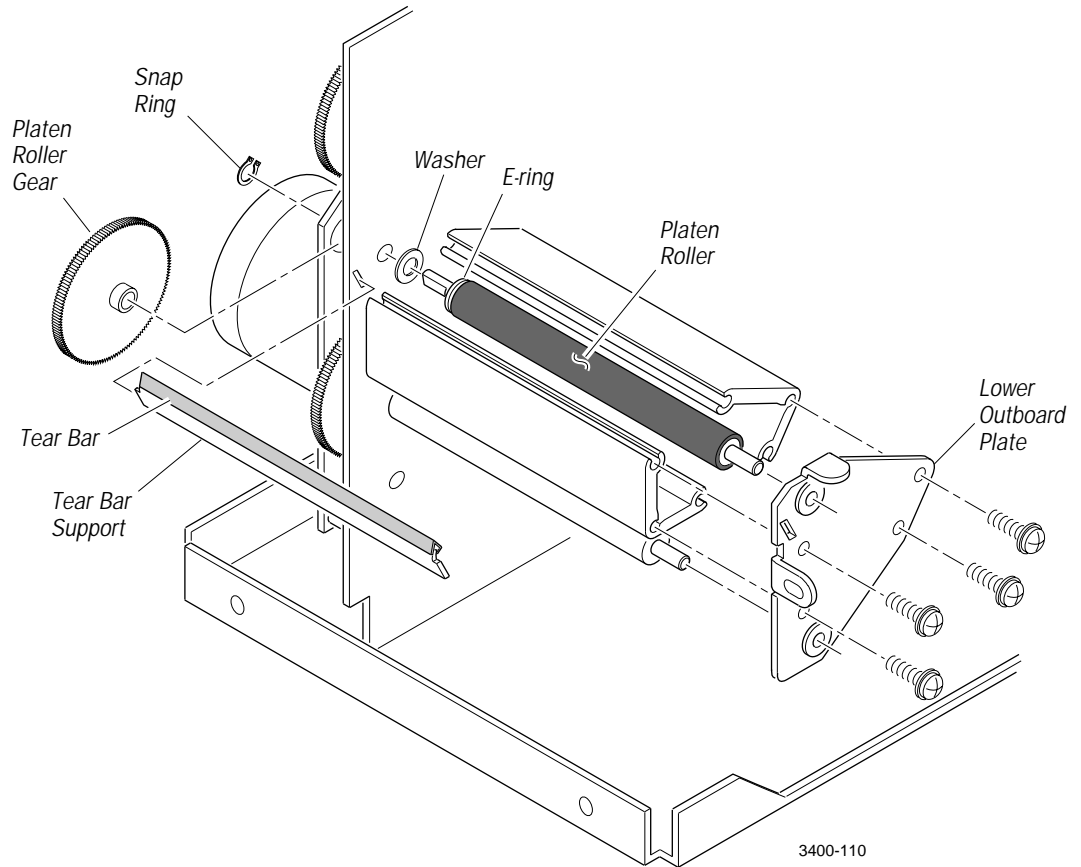
7. Slide the motor forward and press into the self-strip assist gear/pulley and the TTR assist roller gear. Spin the platen roller to check for gear engagement and tighten the motor mounting screws.

8. Replace the lower outboard plate and secure with the four screws removed in Step 4.

   *Note: When reinstalling the lower outboard plate, remember to replace the tear bar and support.*

   *Note: Use the roller alignment tool, Part No. T42389, during reassembly for proper alignment of the outboard plate. See Chapter 3, "Testing and Adjusting," for a detailed description of the roller alignment procedure.*

9. Reattach all of the printer covers.

10. Install the power cord and switch the printer power on to test for proper operation.

# *TTR Assist Roller Replacement*

If you damage the ribbon assist roller, replace it by using the following parts:

- TTR assist roller, Part No. 058997-005
- Snap ring pliers
- Needlenose pliers
- #2 Phillips screwdriver

**To replace the TTR assist roller**

1. Switch off printer power and remove the power cord.

2. Remove the media cover, the electronics cover, and the front bezel cover.

3. Use the needlenose pliers to remove the TTR assist roller gear e-ring located on the electronics side of the printer. Remove the drive belt from the gear.

4. Remove the snap ring that secures the head lift lever to the cam assembly shaft. Pull the head lift lever off of the head lift shaft.

5. Use the spring hook tool to remove the printhead spring from the upper outboard plate.

6. Remove the four screws that secure the upper outboard plate. Remove the upper outboard plate.

7. Making a note of washer and gear positions, remove the TTR assist roller.

*Replacing the TTR Assist Roller*



TTR Assist
Roller

E-ring

Cam Assembly
Shaft

Washer

Printhead
Spring

E-ring   Washer

Upper Outboard
Plate

Head Lift
Lever

Snap Ring

3400-122
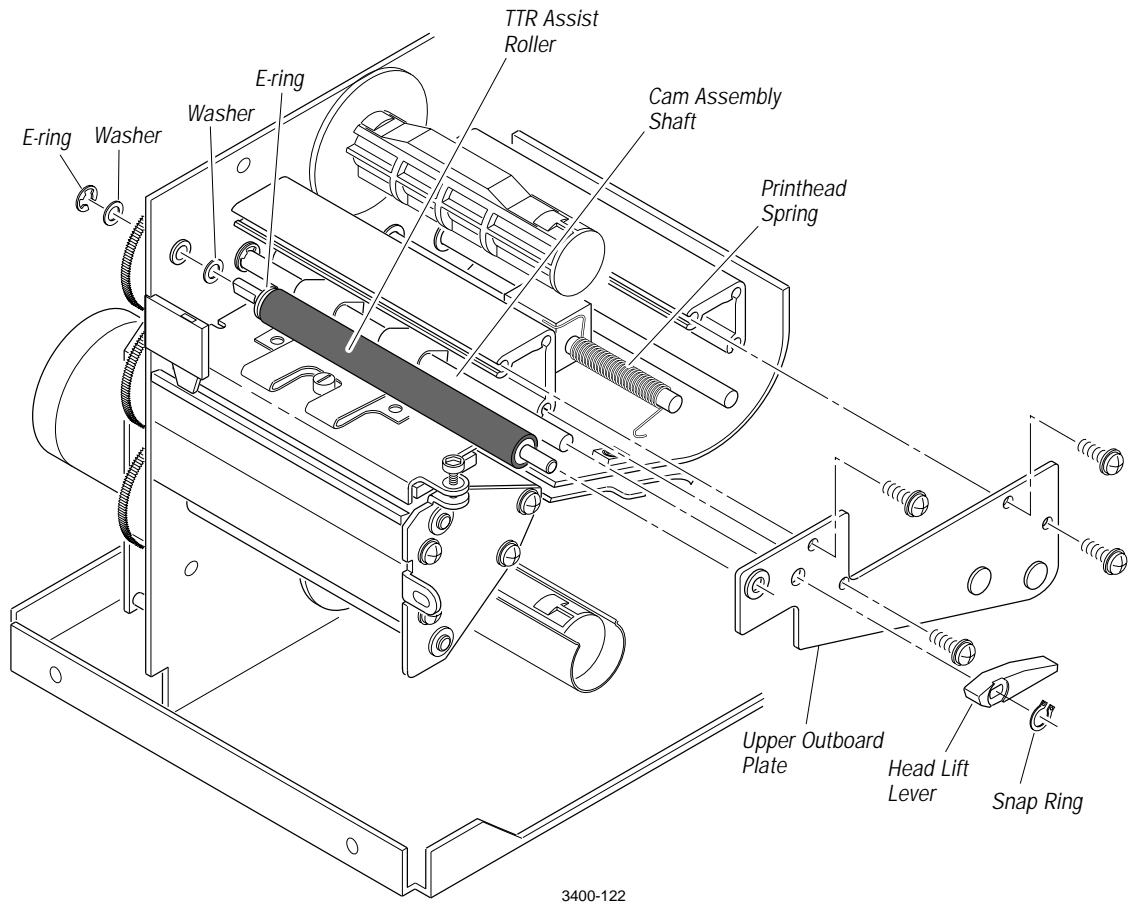
8. Insert the new TTR assist roller. Ensure that the gear, washers, and e-rings are in the proper order. Reattach the TTR assist roller gear e-ring. Reinstall the drive belt.

*Note: The printhead spring is the most difficult part to reinstall. Put the complete assembly together and then hook the spring around the upper plate.*

9. Replace the upper outboard plate. When reinserting the upper outboard plate, make sure that all four shafts are firmly inserted into their corresponding cutouts in the upper outboard plate.

10. Secure the upper outboard plate to the printer with the four Phillips screws removed in Step 3.

    *Note: Use the roller alignment tool, Part No. T42389, during reassembly for proper alignment of the outboard plate. See Chapter 3, "Testing and Adjusting," for a detailed description of the roller alignment procedure.*

11. Replace the head lift lever and secure it with the snap ring removed in Step 4.

12. Reattach all of the printer covers.

13. Install the power cord and switch the printer power on to test for proper operation.

# Stepper Motor Replacement

To replace the stepper motor, you need the following items:

• Main stepper motor cable assembly, Part No. 059021-002

• #2 Phillips screwdriver

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

*Note: When reinstalling the motor, make sure the motor cable is pointing toward the back of the printer (eight o'clock).*

*Note: When reinstalling the motor, adjust the motor gear so that it engages with the two opposing gears without binding or slipping.*

### To replace the stepper motor

1. Switch off printer power and remove the power cord.

2. Remove the media cover and the electronics side cover.

3. Unplug the motor cable from the main PCB.

4. Remove the three screws holding the motor to the motor plate and motor mount bracket. Remove the motor.

5. Replace the stepper motor and attach it to the motor plate with the three screws removed in Step 4. Partially tighten the screws. Slide the stepper motor forward into alignment with the platen roller gear and the self-strip roller gear. Completely tighten the three screws. Make sure that the stepper gear is securely meshed with the other two gears. There should be no stripping or "backlash" between the gears.

*Replacing the Stepper Motor*



Main
Board

Screw
(3 places)

Stepper
Motor

Motor
Plate

J9

Stepper
Motor

Do not install
a screw in this
mounting hole.

3400-123
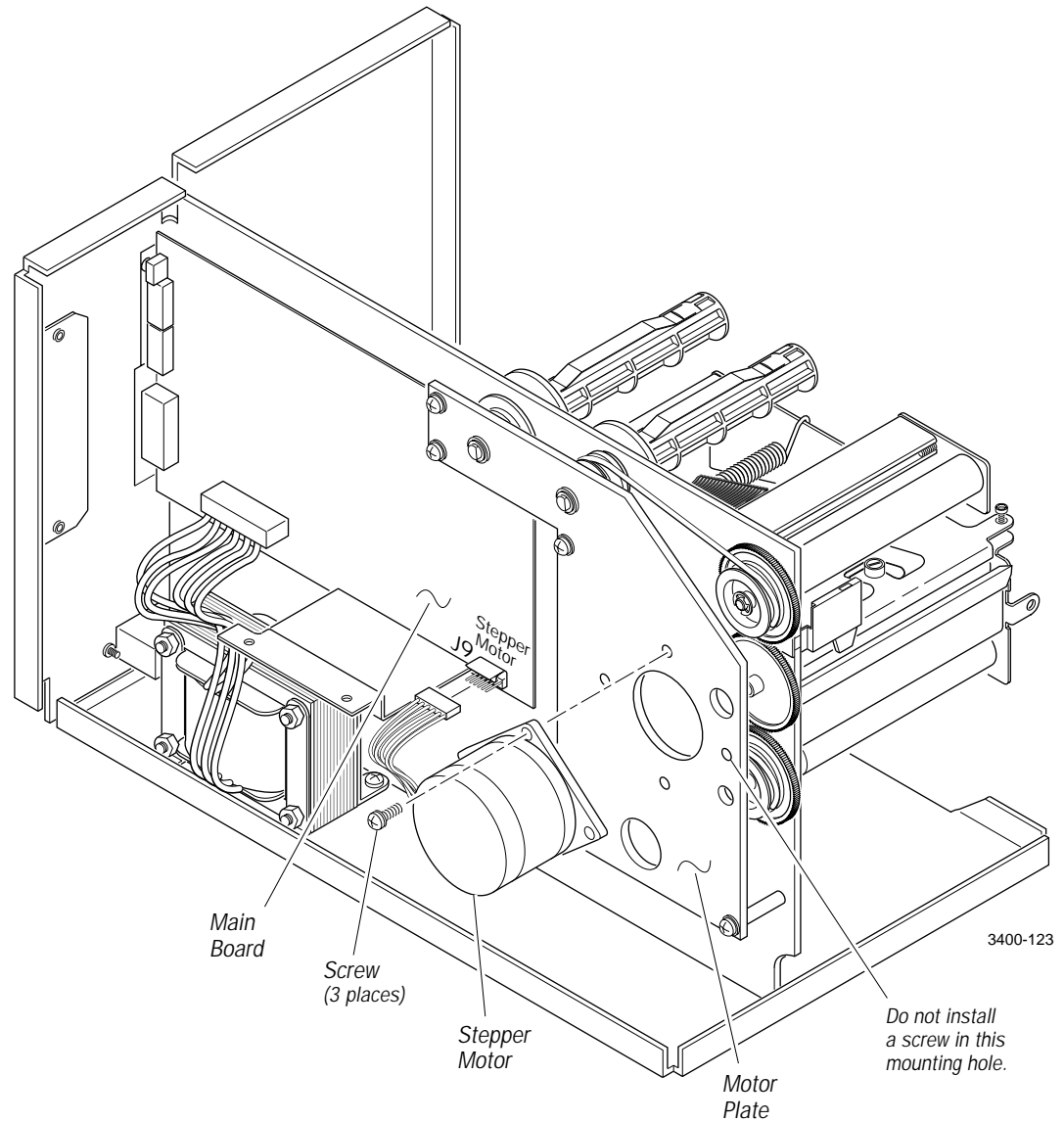
6. Reattach the motor cable to the main PCB and reattach all printer covers.

7. Install the power cord and switch the printer power on to test for proper
operation.

# AC Plug and Input Filter Replacement

To replace the AC plug and input filter, you need the following items:

- 3400 line AC filter assembly, Part No. 060246-002
- #2 Phillips screwdriver
- Needlenose pliers

### To replace the AC plug and the input filter

1. Remove the media cover and the electronics cover.
2. Remove the three push-on connectors (white, black, and green leads) that are attached to the back of the plug with the needlenose pliers.
3. Remove the two screws located on the back plate of the printer.
4. Slide the AC plug and input filter from the printer frame.

White Lead

Black Lead

Green Lead

AC Power
Plug & Filter

*(2 places)*
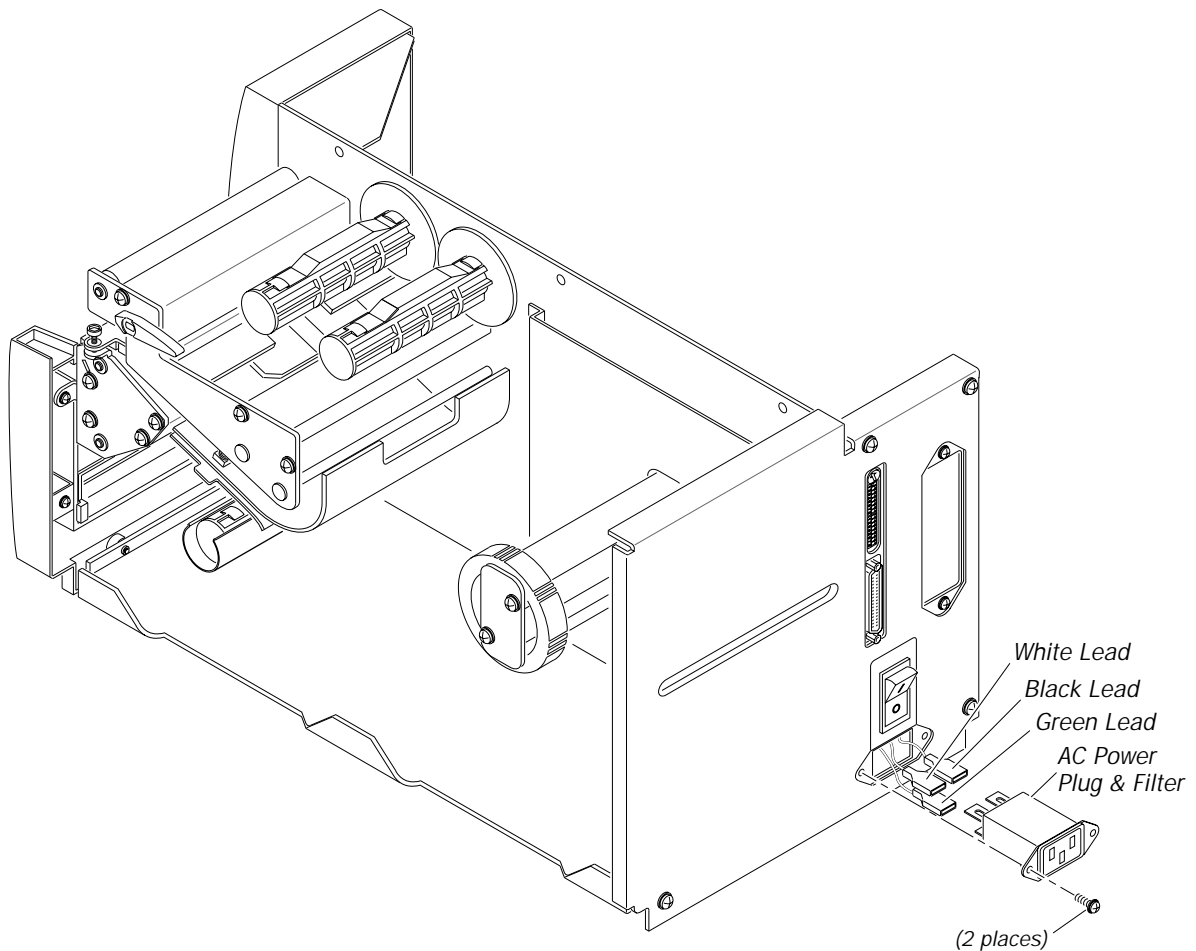
3400-124

5. Replace the AC power plug and input filter.

6. Replace the two screws removed in Step 3.

7. Reconnect the three push-on connectors removed in Step 2.

8. Replace the printer covers.

9. Install the power cord and switch the printer power on to test for proper operation.

# *Power Switch and Circuit Breaker Replacement*

To replace the power switch and circuit breaker, you need the following items:

- AC power connector receptacle, Part No. 580096

- Needlenose pliers

- #2 Phillips screwdriver

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

### To replace the power switch and circuit breaker

1. Remove the media cover and the electronics cover.

2. Use the needlenose pliers to remove the two push-on connectors attached to the power switch.

3. Compress the tabs that hold the power switch secured to the back plate and push it out of the printer frame.

4. Replace the power switch by pushing the new receptacle into the cutout in the printer frame.

5. Reattach the two push-on connectors removed in Step 2.

6. Replace the printer covers.

7. Install the power cord and switch the printer on to test for proper operation.

*Replacing the Power Switch and Circuit Breaker*

Rear
Panel

I/O Switch

Black Lead

White Lead

Tabs
*(Press the tabs
and push the
I/O switch out from
the rear panel.)*

3400-125
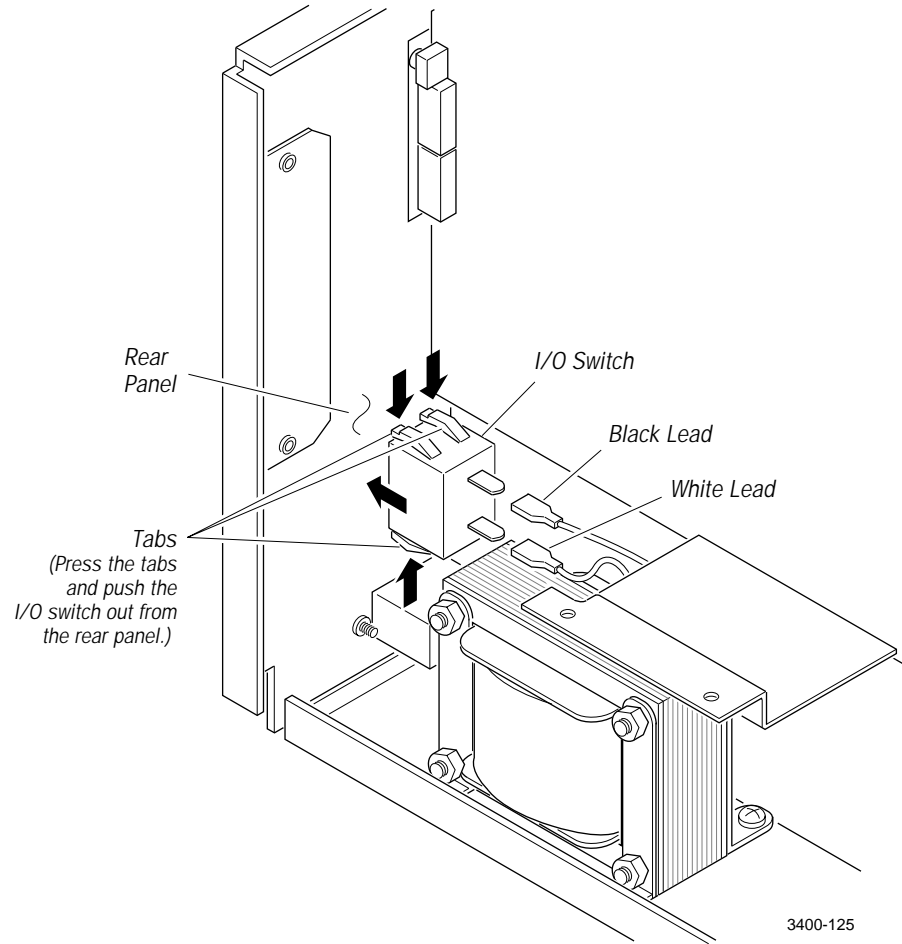
# *Transformer Replacement*

To replace the transformer, you need a #2 Philips screwdriver and one of the following items:

- 100V transformer assembly, Part No. 060028-001

- 115V transformer assembly, Part No. 059016-001

- 200V transformer assembly, Part No. 060029-001

- 230V transformer assembly, Part No. 059816-001

**To replace the transformer**

1. Switch off printer power and remove the power cord.

2. Remove the electronics side cover.

3. Disconnect the transformer cable from the main PCB, the AC power receptacle, and the ON/OFF switch.

4. Remove the two screws holding the transformer to the printer base and slide the transformer toward the front of the printer to free it from the metal tabs in the base of the printer. Lift the transformer away from the printer.

5. Replace the transformer and push it toward the back of the printer securing it under the tabs in the printer base.

6. Secure the transformer to the printer base with the two screws removed in Step 4.

7. Reattach the transformer cables to the main PCB, the AC power receptacle, and the power switch.

8. Reattach the printer covers.

9. Install the power cord and switch the printer on to test for proper operation.

## Replacing the Transformer

I/O Switch

Main PCB

J10

Power Supply

AC Power Plug

Transformer

Screw
(2 places)
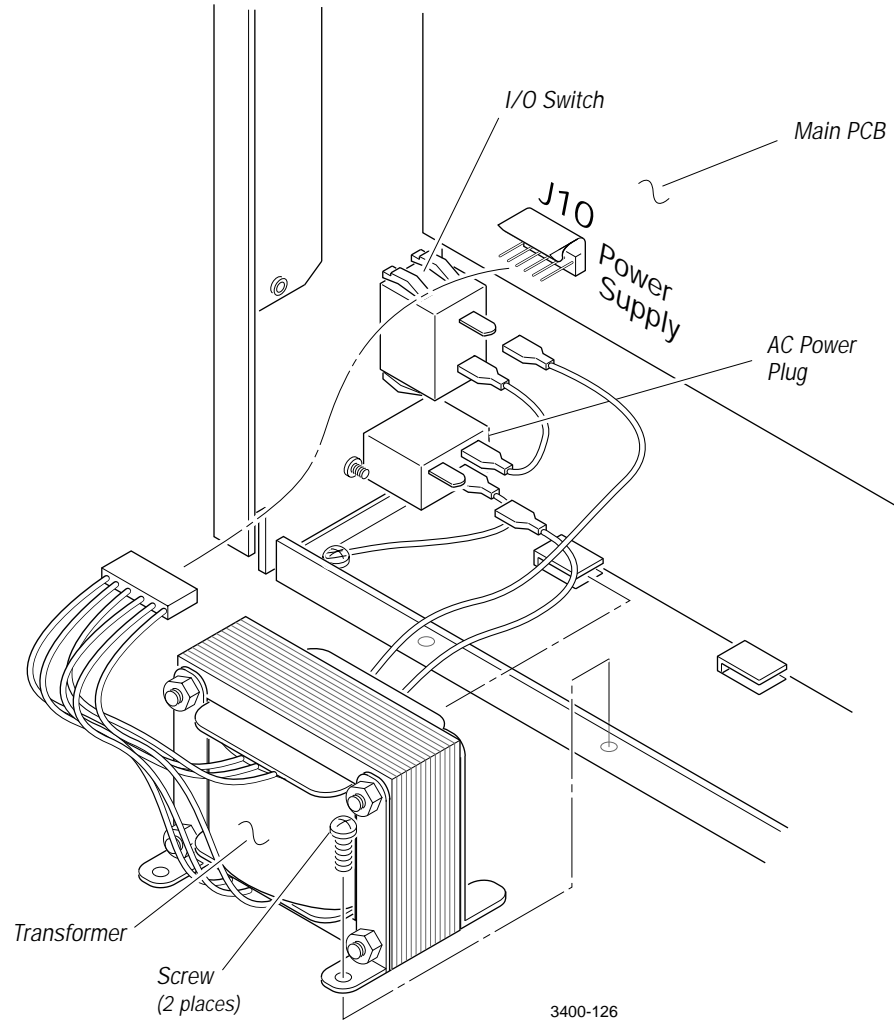
3400-126

# 7

# Assembly Drawings

This chapter contains the assembly drawings for the main PCB assembly for the 3400A, 3400B, and 3400C and for the memory expansion card assemblies (2M, 6M, and 8M) for the 3400B and 3400C printers.

# 3400A Main PCB Assembly

```
PL# 059050-003        TITLE: PCB ASSY,MAIN,3400                  PAGE 1/8
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--------------------------------------------------------------------------------
ITEM  QTY   PART NO.   REFDES      DESCRIPTION                  X     Y   F/B
--------------------------------------------------------------------------------
  1    1   059049-003              PCB,MAIN,3400
  2   .001 046766                  LBL.STK..23HX1.50L,4-HI.4MIL.
  3    1   580213                  CONN.2-POSN.SHORTING,.10 CTRS.
  4    4   586250                  SPACER,COMP.,.187X.063X.20
                "
                "
                "
  5   .001 060053-001              PROC,FCTN TEST,PCB
  6    1   056914       U12        IC,ASIC,THERMAL COMPENSATION  6.5   2.9   F
  7    1   059133-001   U23        CONFIG GAL,16V8,CHIP SELECT   6.3   4.7   F
  8    1   059134-001   U25        CONFIG GAL,16V8,RD/WR CYCLE   6.9   4.7   F
  9    1   059135-001   U13        CONFIG GAL,16V8,DRAM I/F      5.7   4.0   F
 10    1   550617       R98        RES.CARB 1.00W  5%    .51  OHM 6.7   1.4   F
 11    2   550694       R130       RES.CARB 1.00W  5% 820.0   OHM 3.5   1.1   F
                "        R192                                    7.9   2.1   F
 12    1   550700       R129       RES.CARB 1.00W  5%    1.5  KOHM 3.5   1.4   F
 13    2   550816       R102       RES,CARB,2W,5%,.47 OHM        8.8   0.8   F
                "        R117                                    7.5   0.8   F
 14    1   555450       R125       RES.POT.SIDE ADJ.W/KNOB 10KOHM 0.3   4.8   F
 15    1   555901       R124       RES.S/M.POT TOP ADJ.100 KOHM  8.4   3.1   F
 16   18   556603        R1        RES.S/M,FILM,.12W,5% 4.7 KOHM 5.2   3.0   F
                "        R11                                     5.2   3.3   F
                "        R35                                     5.5   5.2   F
                "        R36                                     5.3   5.2   F
                "        R74                                     5.7   3.5   F
                "        R75                                     5.9   3.5   F
                "        R76                                     6.9   3.5   F
                "        R96                                     9.1   1.3   F
                "        R97                                     9.1   1.7   F
                "        R107                                    4.7   0.8   F
                "        R108                                    7.7   1.5   F
                "        R109                                    8.2   1.5   F
                "        R110                                    8.2   1.4   F
                "        R114                                    7.3   1.5   F
                "        R128                                    3.2   0.8   F
                "        R142                                    9.7   1.2   F
                "        R157                                    6.7   4.4   F
```

```
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------------------------------------------------------------------------
ITEM  QTY   PART NO.   REFDES    DESCRIPTION            X     Y   F/B
------------------------------------------------------------------------
            "          R185                            7.5   4.1   F
 17   85    556604       R2      RES,S/M,FILM,.12W,5%,10 KOHM  5.4  4.8  F
            "            R3                             4.4   4.9   F
            "            R5                             1.3   1.2   F
            "            R9                             4.4   5.0   F
            "            R10                            1.3   1.3   F
            "            R12                            6.1   4.2   F
            "            R13                            4.0   3.6   F
            "            R14                            3.3   5.1   F
            "            R15                            6.2   5.0   F
            "            R16                            4.5   3.3   F
            "            R17                            1.1   3.6   F
            "            R18                            6.2   5.1   F
            "            R19                            5.2   3.1   F
            "            R20                            4.4   4.7   F
            "            R23                            5.2   2.7   F
            "            R24                            5.2   2.8   F
            "            R25                            4.4   5.1   F
            "            R26                            5.8   2.0   F
            "            R27                            3.9   4.5   F
            "            R28                            3.9   4.6   F
            "            R29                            4.4   4.8   F
            "            R32                            1.3   1.6   F
            "            R33                            1.3   1.5   F
            "            R37                            3.3   5.0   F
            "            R38                            4.6   5.1   F
            "            R39                            0.6   2.9   F
            "            R40                            0.6   3.0   F
            "            R41                            0.6   3.1   F
            "            R42                            0.6   3.2   F
            "            R43                            0.6   3.3   F
            "            R44                            0.6   3.4   F
            "            R45                            0.6   3.5   F
            "            R46                            0.6   3.6   F
            "            R47                            0.6   3.8   F
            "            R48                            0.6   3.9   F
            "            R49                            0.6   4.0   F
            "            R50                            0.6   4.1   F
            "            R51                            0.6   4.2   F
            "            R52                            0.6   4.3   F
            "            R53                            0.6   4.4   F
            "            R54                            0.6   4.5   F
            "            R55                            4.1   3.0   F
            "            R56                            2.3   4.5   F
```

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```
--------------------------------------------------------------------------------
ITEM  QTY   PART NO.   REFDES    DESCRIPTION                    X     Y    F/B
--------------------------------------------------------------------------------
            "          R57                                     1.4   2.9   F
            "          R58                                     1.4   3.1   F
            "          R59                                     1.4   3.0   F
            "          R60                                     1.4   3.2   F
            "          R61                                     1.4   3.3   F
            "          R62                                     1.4   3.4   F
            "          R63                                     1.4   3.5   F
            "          R64                                     1.4   3.6   F
            "          R65                                     1.4   3.7   F
            "          R66                                     1.4   3.8   F
            "          R67                                     1.4   3.9   F
            "          R68                                     1.4   4.0   F
            "          R69                                     1.4   4.1   F
            "          R70                                     1.4   4.2   F
            "          R71                                     1.4   4.3   F
            "          R72                                     1.4   4.4   F
            "          R95                                     6.9   4.2   F
            "          R99                                     9.1   1.1   F
            "          R100                                    9.1   1.6   F
            "          R103                                    9.1   1.5   F
            "          R105                                    7.3   1.6   F
            "          R111                                    8.6   1.1   F
            "          R118                                    8.2   1.3   F
            "          R120                                    8.2   1.2   F
            "          R131                                    9.3   2.7   F
            "          R133                                    9.3   3.7   F
            "          R134                                    8.5   3.6   F
            "          R139                                    6.0   0.5   F
            "          R144                                    9.3   3.0   F
            "          R146                                    6.4   1.0   F
            "          R151                                    3.3   4.9   F
            "          R152                                    3.3   4.8   F
            "          R153                                    3.9   4.8   F
            "          R154                                    3.9   4.9   F
            "          R155                                    3.9   5.0   F
            "          R156                                    5.9   5.0   F
            "          R158                                    1.3   1.8   F
            "          R183                                    4.8   1.1   F
            "          R187                                    9.1   1.8   F
            "          R193                                    4.8   3.3   F
            "          R194                                    7.5   3.2   F
            "          R195                                    9.7   1.7   F
 18    1   556607     R116      RES,S/M,FILM,.12W,5%,100 KOHM  9.3   3.9   F
 19   45   556629     R77       RES,S/M,FILM,.12W,5%,47 OHM    7.5   4.9   F
```

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--------------------------------------------------------------------------------
ITEM  QTY   PART NO.   REFDES    DESCRIPTION               X     Y   F/B
--------------------------------------------------------------------------------
            "          R78                                7.5   5.0   F
            "          R79                                7.5   4.7   F
            "          R80                                7.5   4.8   F
            "          R81                                5.8   1.7   F
            "          R82                                7.5   4.6   F
            "          R83                                7.5   4.5   F
            "          R84                                5.8   1.6   F
            "          R85                                7.5   4.4   F
            "          R86                                5.8   1.5   F
            "          R87                                7.5   4.3   F
            "          R88                                5.8   1.4   F
            "          R89                                5.3   1.3   F
            "          R90                                5.5   1.4   F
            "          R91                                5.5   1.5   F
            "          R92                                5.5   1.6   F
            "          R93                                5.5   1.7   F
            "          R94                                5.5   1.8   F
            "          R112                               7.7   1.6   F
            "          R159                               4.1   4.9   F
            "          R160                               9.7   1.8   F
            "          R161                               7.5   5.2   F
            "          R162                               5.8   4.8   F
            "          R163                               6.4   5.0   F
            "          R164                               7.5   5.1   F
            "          R165                               7.5   3.8   F
            "          R166                               7.5   3.7   F
            "          R167                               7.5   4.0   F
            "          R168                               7.5   3.9   F
            "          R169                               5.5   1.9   F
            "          R170                               5.8   1.9   F
            "          R171                               6.1   4.1   F
            "          R172                               7.5   3.1   F
            "          R173                               7.5   3.0   F
            "          R174                               7.5   2.9   F
            "          R175                               7.5   2.8   F
            "          R176                               7.5   2.7   F
            "          R177                               7.5   2.6   F
            "          R178                               7.5   2.5   F
            "          R179                               7.5   3.6   F
            "          R180                               7.5   3.5   F
            "          R181                               7.5   3.3   F
            "          R182                               7.5   3.4   F
            "          R184                               6.1   4.3   F
            "          R197                               5.2   3.2   F
```

```
-------------------------------------------------------------------------------
ITEM  QTY   PART NO.    REFDES     DESCRIPTION                    X     Y    F/B
-------------------------------------------------------------------------------
 20    1   556640       R198    RES,S/M,FILM,.12W,5%,150 OHM     6.2   3.5   F
 21    5   556648        R34    RES,S/M,FILM,.12W,5%,390 OHM     3.0   4.6   F
           "            R115                                     9.0   4.0   F
           "            R123                                     9.3   3.5   F
           "            R132                                     9.3   3.8   F
           "            R143                                     9.3   3.1   F
 22    8   556658         R4    RES,S/M,FILM,.12W,5%,1.0 KOHM    4.3   3.0   F
           "            R113                                     7.7   1.4   F
           "            R119                                     8.0   1.5   F
           "            R121                                     8.0   1.4   F
           "            R122                                     8.5   3.0   F
           "            R126                                     0.6   4.6   F
           "            R148                                     5.4   1.0   F
           "            R150                                     5.6   0.9   F
 23    3   556665       R135    RES,S/M,FILM,.12W,5%,2.0 KOHM    5.8   0.7   F
           "            R136                                     6.2   1.1   F
           "            R137                                     6.4   1.1   F
 24    1   556670       R186    RES,S/M,FILM,.12W,5%,3.3 KOHM    5.3   0.8   F
 25    1   556672       R149    RES,S/M,FILM,.12W,5%,3.9 KOHM    9.5   1.1   F
 26    1   556676       R106    RES,S/M,FILM,.12W,5%,6.2 KOHM    5.0   0.7   F
 27    1   556687       R101    RES,S/M,FILM,.12W,5%,22 KOHM     4.5   0.8   F
 28    1   556690       R138    RES,S/M,FILM,.12W,5%,30 KOHM     9.8   1.1   F
 29    2   556692       R127    RES,S/M,FILM,.12W,5%,36 KOHM     3.2   0.9   F
           "            R196                                     8.9   2.8   F
 30    2   556710        R30    RES,S/M,FILM,.12W,5%,330 KOHM    5.1   4.8   F
           "            R104                                     4.7   1.0   F
 31    1   556712       R140    RES,S/M,FILM,.12W,5%,390 KOHM    5.8   1.1   F
 32    2   556742        R31    RES,S/M,FILM,.12W,5%,9.1 MOHM    4.8   4.8   F
           "             R73                                     6.3   3.6   F
 33    1   556837-029   R147    RES,S/M,FILM,1/8W,1%,200 OHMS    6.2   0.5   F
 34    1   561008        C65    CAP,ALUM,RDL LEAD,50VMIN,100UF   9.6   2.1   F
 35    1   561016-001    C58    CAP,AL,50 V,10000 UF             2.1   1.9   F
 36    1   561302        C60    CAP.ALUM. 15V MIN      220. UF   1.4   1.1   F
 37    1   561908        C53    CAP.AL.R/L 16V        4700. UF   3.8   0.4   F
 38    2   563602        C46    CAP.S/M,TANT,10V MIN+-20%,10UF   4.6   0.6   F
           "             C54                                     6.7   0.4   F
 39    6   563605        C43    CAP.S/M,TANT.35V,20%,1UF         8.6   1.6   F
           "             C45                                     8.6   0.6   F
           "             C50                                     7.7   1.3   F
           "             C51                                     7.7   1.1   F
           "             C55                                     4.4   0.4   F
           "             C56                                     6.7   0.5   F
 40    3   563606        C35    CAP.S/M TANT. 6VMIN 10% 68UF     6.2   5.3   F
           "             C81                                     6.4   1.7   F
```

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------------------------------------------------------------------------------
ITEM  QTY   PART NO.   REFDES      DESCRIPTION                X     Y    F/B
------------------------------------------------------------------------------
            "          C82                                   1.2   2.6   F
 41   40    563700     C1       CAP,S/M,CER,50VMIN,20%,.1 UF  0.9   0.9   F
            "          C2                                     4.1   2.8   F
            "          C3                                     5.2   3.4   F
            "          C4                                     5.4   4.2   F
            "          C5                                     4.2   3.4   F
            "          C6                                     4.1   4.7   F
            "          C7                                     4.0   4.2   F
            "          C8                                     4.8   3.4   F
            "          C10                                    0.9   1.4   F
            "          C12                                    4.6   4.8   F
            "          C13                                    3.5   4.7   F
            "          C15                                    4.6   4.9   F
            "          C16                                    0.9   2.9   F
            "          C17                                    2.5   4.5   F
            "          C18                                    0.9   3.8   F
            "          C19                                    3.8   1.8   F
            "          C20                                    2.6   2.6   F
            "          C21                                    3.3   4.6   F
            "          C23                                    2.9   1.5   F
            "          C25                                    7.1   2.9   F
            "          C26                                    5.9   2.9   F
            "          C27                                    6.4   4.4   F
            "          C28                                    6.9   4.3   F
            "          C29                                    5.5   2.0   F
            "          C30                                    6.6   3.5   F
            "          C31                                    5.8   3.7   F
            "          C32                                    6.6   2.2   F
            "          C33                                    5.7   2.8   F
            "          C34                                    4.3   1.3   F
            "          C36                                    5.0   1.3   F
            "          C37                                    6.9   3.7   F
            "          C38                                    4.9   2.7   F
            "          C61                                    9.3   2.8   F
            "          C63                                    5.8   0.4   F
            "          C64                                    9.6   2.4   F
            "          C67                                    6.4   0.9   F
            "          C70                                    5.6   0.9   F
            "          C72                                    9.6   2.5   F
            "          C75                                    6.1   0.9   F
            "          C76                                    4.3   2.7   F
 42    4    563701     C9       CAP,S/M,CER,50WVDC,5%,10 PF   5.1   4.9   F
            "          C11                                    4.8   4.9   F
            "          C22                                    6.5   3.7   F
```

```
-----------------------------------------------------------------------------
ITEM  QTY   PART NO.   REFDES     DESCRIPTION                   X     Y    F/B
-----------------------------------------------------------------------------
            "          C24                                     6.2   3.7   F
 43   10   563702      C68     CAP,S/M,CER,50WVDC,5%,100 PF     5.3   0.9   F
            "          C96                                     5.6   0.8   F
            "          C99                                     5.7   3.4   F
            "          C100                                    7.8   2.8   F
            "          C101                                    7.8   2.9   F
            "          C102                                    7.8   3.0   F
            "          C103                                    7.8   3.1   F
            "          C104                                    7.8   2.7   F
            "          C105                                    7.8   2.6   F
            "          C106                                    7.8   2.5   F
 44    9   563705      C14     CAP,S/M,CER,50VMIN,10%,.01 UF    4.6   5.0   F
            "          C40                                     9.1   1.2   F
            "          C47                                     8.2   1.1   F
            "          C52                                     9.3   4.0   F
            "          C57                                     0.6   4.7   F
            "          C59                                     9.3   3.4   F
            "          C66                                     9.7   1.3   F
            "          C73                                     9.3   2.9   F
            "          C74                                     9.3   3.6   F
 45    2   563715      C44     CAP,S/M,CER,50VMIN,20%,.22 UF    4.2   0.8   F
            "          C49                                     5.0   0.8   F
 46    2   563716      C41     CAP,S/M,CER,50VMIN,5%,.001 UF    9.1   1.4   F
            "          C48                                     8.2   1.6   F
 47   16   563720      C77     CAP,S/M,CER,50VMIN,5%,150 PF     5.4   3.9   F
            "          C78                                     4.0   3.8   F
            "          C79                                     4.8   4.7   F
            "          C80                                     4.5   3.4   F
            "          C83                                     2.6   2.5   F
            "          C84                                     3.3   4.5   F
            "          C85                                     2.8   4.5   F
            "          C86                                     5.7   4.3   F
            "          C87                                     6.4   4.3   F
            "          C88                                     6.9   4.4   F
            "          C89                                     5.8   3.6   F
            "          C90                                     5.7   2.9   F
            "          C91                                     6.9   3.6   F
            "          C92                                     4.9   2.8   F
            "          C93                                     6.6   2.3   F
            "          C94                                     6.6   3.6   F
 48    5   563729      C39     CAP,S/M,CER,50VMIN,10%,1 UF      7.3   1.1   F
            "          C42                                     7.3   0.6   F
            "          C95                                     3.2   0.6   F
            "          C97                                     5.5   0.4   F
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PL# 059050-003      TITLE: PCB ASSY,MAIN,3400                    PAGE 8
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--------------------------------------------------------------------------
ITEM  QTY   PART NO.   REFDES     DESCRIPTION                X     Y    F/B
--------------------------------------------------------------------------
            "          C98                                  9.7   1.5   F
 49    2   564116      D19      DIODE,TYPE MR851            6.9   1.2   F
            "          D21                                  6.7   1.2   F
 50   12   564202      D3       DIODE,S/M,TYPE BAS16       3.2   4.7   F
            "          D5                                   4.2   5.2   F
            "          D6                                   8.9   1.4   F
            "          D7                                   3.5   0.9   F
            "          D8                                   3.7   0.9   F
            "          D10                                  8.2   1.7   F
            "          D18                                  5.6   0.6   F
            "          D22                                  5.9   0.9   F
            "          D23                                  6.2   0.7   F
            "          D26                                  2.8   1.2   F
            "          D27                                  2.6   1.2   F
            "          D29                                  6.1   0.4   F
 51    3   564206      D1       DIODE,S/M,TYPE MMBD301     4.8   3.0   F
            "          D2                                   4.7   3.0   F
            "          D4                                   3.4   4.7   F
 52    2   564217      D15      DIODE,S/M TYPE 5231 ZENER,5V   3.8   0.9   F
            "          D28                                  9.4   1.6   F
 53    2   564219      D16      DIODE,S/M TYPE 5245 ZENER,15V  4.0   0.9   F
            "          D20                                  5.9   0.4   F
 54    1   564235      D9       DIODE,S/M,TYPE 5226,ZENER,3.3V  4.7   0.9   F
 55    2   564239-001  D12      DIODE,S/M,DUAL,6A,100V     2.7   0.4   F
            "          D13                                  2.3   0.4   F
 56    1   565091-001  Q5       XSTR,FET,60V,30A           6.1   0.2   F
 57    3   565101      Q2       TRANS,S/M,NPN,TYPE 4401    3.9   5.2   F
            "          Q9                                   9.3   1.6   F
            "          Q10                                  9.4   1.8   F
 58    1   565110      Q7       XSTR,S/M,TYPE 6427 DARLINGTON  6.1   0.7   F
 59    2   565111      Q3       TRANSISTOR,S/M,TYPE 2222A,NPN  7.5   1.6   F
            "          Q6                                   5.9   0.7   F
 60    1   567024      VR1      VOLTAGE REGULATOR,5V,1A    6.8   0.2   F
 61    1   574079      U24      IC,TYPE UDN2998W,MOTOR DRIVER  8.4   0.2   F
 62    1   578020      U28      IC,S/M,TYPE 74HC04         5.7   4.6   F
 63    1   578023      U5       IC,S/M,TYPE 74HC32         3.6   5.0   F
 64    1   578025      U22      IC,S/M,TYPE LP339          8.6   1.3   F
 65    4   578081      U7       IC,S/M,TYPE 74HCT245       0.9   3.2   F
            "          U10                                  0.9   4.1   F
            "          U14                                  4.4   2.4   F
            "          U15                                  5.6   2.4   F
 66    1   578086      U2       IC,S/M,TYPE 14C88 CMOS DRIVER  1.0   2.0   F
 67    1   578087      U4       IC,S/M,TYPE 14C89,CMOS RCVR    1.0   1.6   F
 68    1   578131      U11      IC,S/M,TYPE IDT72105,FIFO  3.9   2.3   F
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--------------------------------------------------------------------------
ITEM  QTY   PART NO.    REFDES      DESCRIPTION                 X     Y   F/B
--------------------------------------------------------------------------
 69    1   578132        U30    IC,S/M,TYPE MC145041          8.5   3.9   F
 70    1   578134        U1     IC,S/M,TYPE 75ALS180          1.0   1.1   F
 71    1   578135        U29    IC,S/M,TYPE MC34064           4.4   2.9   F
 72    1   578136        U31    IC,S/M,TYPE LM393             5.0   0.9   F
 73    1   578137        D11    IC,S/M,TYPE LM385-1.2         4.4   0.9   F
 74    1   578145        Y2     CRYSTAL,S/M,24MHZ            6.5   3.8   F
 75    3   578209-001    U16    IC,S/M,TYPE 74ALS257         5.0   2.4   F
           "             U18                                 5.7   3.1   F
           "             U20                                 6.9   4.0   F
 76    2   578210-001    U17    IC,S/M,TYPE 256KX4,DRAM,80NS  4.4   1.7   F
           "             U19                                 5.1   1.7   F
 77    1   578211-001    U3     IC,S/M,TYPE MC68332,MICPRCS   4.7   4.1   F
 78    1   578245-001    U27    IC,S/M,LM293,DUAL VOLT COMPTR 6.0   1.1   F
 79   17   580231        J6     CONN,26-POSN.HDR.SNGL.ROW/.100 4.0  1.7   F
           "             J8                                  7.7   5.1   F
           "             TP1                                 8.1   3.7   F
           "             TP2                                 8.1   3.1   F
           "             TP3                                 5.0   0.3   F
           "             TP4                                 8.1   3.5   F
           "             TP5                                 7.9   1.6   F
           "             TP6                                 4.1   0.9   F
           "             TP8                                 8.4   1.7   F
           "             TP9                                 5.6   4.8   F
           "             TP13                                4.7   0.3   F
           "             TP14                                8.1   2.7   F
           "             TP15                                8.7   3.3   F
           "             TP16                                8.9   3.9   F
           "             TP17                                8.9   4.2   F
           "             TP18                                8.2   4.0   F
           "             TP19                                8.9   3.7   F
 80    1   580285        J10    CONN.HDR. 8-POSN.STRAIGHT THRU 2.9  0.9   F
 81    3   580359        J11    CONN.HDR.4-POSN.STRAIGHT THRO. 10.2 3.5   F
           "             J12                                 9.7   3.9   F
           "             J13                                 9.7   3.1   F
 82    1   580434        J1     CONN.25-POSN.D/SUB W/SNAP     0.7   0.8   F
 83    1   581976        J14    CONN,40-POSN,HDR,.1 DBL ROW  10.2   0.6   F
 84    2   581978        J9     CONN,6-POSN,HDR,.100,FRIC LOCK 8.9  0.2   F
           "             J15                                 8.9   3.0   F
 85    2   582065        SW1    SW,8-POSN.DIP,SIDE ACTUATED   0.1   3.6   F
           "             SW2                                 0.1   4.5   F
 86    3   584274        XU6    SOC.32-POSN. DIP,LOW PROFILE  1.6   4.3   F
           "             XU8                                 2.4   4.3   F
           "             XU9                                 3.2   4.3   F
 87    1   585635-001    L1     INDUCTOR,TOROID,22UH,5A       8.9   2.0   F
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-------------------------------------------------------------------------
ITEM  QTY   PART NO.   REFDES     DESCRIPTION                X     Y   F/B
-------------------------------------------------------------------------
 88    1   586298       BT1    HLDR.BATTERY,AA SIZE          1.9   4.9   F
 89    1   586548-001   Q8     SENSOR,S/M,REFLECTIVE         9.4   4.2   F
 90    1   588000       Y1     CRYSTAL,S/M 32.768 KHZ    4.9   5.1   F
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# 3400B Main PCB Assembly

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PL REV: E                                                         09281994
RUN DATE: Sep 28 07:21:43
--------------------------------------------------------------------------------
ITEM  QTY/UM   PART NO.   REFDES     DESCRIPTION                   X    Y  F/B
--------------------------------------------------------------------------------
  1    1       060537-001            PCB,MAIN,MEM EXP,3400
  2  0.001 RL  046766               LBL.STK..23HX1.50L,4-HI.4MIL.
  3    1       580213               CONN.2-POSN.SHORTING,.10 CTRS.
  4    4       586250               SPACER,COMP.,.187X.063X.20
               "
               "
               "
  5    0       060053-002           PROC,FCTN TEST,PCB
  6    3       584274      XU6      SOC.32-POSN. DIP,LOW PROFILE
               "           XU8
               "           XU9
  7    1       056914      U12      IC,ASIC,THERMAL COMPENSATION  6.2  2.6  F
  8    1       550617      R98      RES.CARB 1.00W   5%    .51  OHM 6.3 1.2  F
  9    2       550694      R130     RES.CARB 1.00W   5% 820.0  OHM 3.2  0.9  F
               "           R192                                  7.6  1.9  F
 10    1       550700      R129     RES.CARB 1.00W   5%    1.5  KOHM 3.2 1.2  F
 11    2       550816      R102     RES,CARB,2W,5%,.47 OHM       8.4  0.6  F
               "           R117                                  7.1  0.6  F
 12    1       555450      R125     RES.POT.SIDE ADJ.W/KNOB 10KOHM 0.1 4.5  F
 13    1       555901      R6       RES.S/M.POT TOP ADJ.100 KOHM 8.1  2.9  F
 14    1       555909-001  R191     RES,S/M,POT,TOP ADJ,20 KOHM  7.9  2.6  F
 15   17       556603      R1       RES.S/M,FILM,.12W,5% 4.7 KOHM 4.8  2.8  F
               "           R7                                    5.7  4.2  F
               "           R11                                   4.8  3.1  F
               "           R35                                   5.1  5.0  F
               "           R36                                   4.9  5.0  F
               "           R74                                   5.3  3.3  F
               "           R75                                   5.6  3.3  F
               "           R76                                   6.5  3.3  F
               "           R96                                   8.7  1.1  F
               "           R107                                  4.3  0.5  F
               "           R108                                  7.3  1.3  F
               "           R109                                  7.8  1.3  F
               "           R114                                  6.9  1.3  F
               "           R128                                  2.8  0.6  F
               "           R142                                  9.3  1.0  F
               "           R157                                  6.3  4.2  F
               "           R185                                  7.1  3.9  F
 16   80       556604      R2       RES,S/M,FILM,.12W,5%,10 KOHM 5.0  4.6  F
               "           R3                                    4.0  4.7  F
               "           R5                                    0.9  1.0  F
               "           R8                                    6.2  4.0  F
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PL# 060538-003      TITLE: PCB ASSY,MAIN,MEM EXP,3400        PAGE 2/9
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--------------------------------------------------------------------------
ITEM  QTY/UM    PART NO.   REFDES     DESCRIPTION              X    Y  F/B
--------------------------------------------------------------------------
              "                R9                             4.0  4.8   F
              "                R10                            0.9  1.1   F
              "                R12                            5.7  4.0   F
              "                R13                            3.6  3.4   F
              "                R14                            2.9  4.9   F
              "                R15                            5.8  4.8   F
              "                R16                            4.2  3.1   F
              "                R17                            0.7  3.4   F
              "                R19                            4.8  2.9   F
              "                R20                            4.0  4.5   F
              "                R23                            4.8  2.5   F
              "                R24                            4.8  2.6   F
              "                R25                            4.0  4.9   F
              "                R26                            4.0  1.8   F
              "                R27                            3.5  4.3   F
              "                R28                            3.5  4.4   F
              "                R29                            4.0  4.6   F
              "                R32                            0.9  1.4   F
              "                R33                            0.9  1.3   F
              "                R37                            2.9  4.8   F
              "                R38                            4.2  4.9   F
              "                R39                            0.2  2.6   F
              "                R40                            0.2  2.7   F
              "                R41                            0.2  2.8   F
              "                R42                            0.2  2.9   F
              "                R43                            0.2  3.0   F
              "                R44                            0.2  3.1   F
              "                R45                            0.2  3.2   F
              "                R46                            0.2  3.3   F
              "                R47                            0.2  3.5   F
              "                R48                            0.2  3.6   F
              "                R49                            0.2  3.7   F
              "                R50                            0.2  3.8   F
              "                R51                            0.2  3.9   F
              "                R52                            0.2  4.0   F
              "                R53                            0.2  4.1   F
              "                R54                            0.2  4.2   F
              "                R55                            3.8  2.8   F
              "                R56                            1.9  4.2   F
              "                R57                            1.0  2.6   F
              "                R58                            1.0  2.8   F
              "                R59                            1.0  2.7   F
              "                R60                            1.0  2.9   F
              "                R61                            1.0  3.0   F
              "                R62                            1.0  3.1   F
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PL# 060538-003      TITLE: PCB ASSY,MAIN,MEM EXP,3400        PAGE 3/9
PL REV: E                                                    09281994
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----------------------------------------------------------------------------
ITEM  QTY/UM   PART NO.   REFDES   DESCRIPTION                X    Y   F/B
----------------------------------------------------------------------------
                 "         R63                               1.0  3.2  F
                 "         R64                               1.0  3.3  F
                 "         R65                               1.0  3.5  F
                 "         R66                               1.0  3.6  F
                 "         R67                               1.0  3.7  F
                 "         R68                               1.0  3.8  F
                 "         R69                               1.0  3.9  F
                 "         R70                               1.0  4.0  F
                 "         R71                               1.0  4.1  F
                 "         R72                               1.0  4.2  F
                 "         R95                               5.7  1.8  F
                 "         R99                               8.7  0.9  F
                 "         R105                              6.9  1.4  F
                 "         R111                              8.2  0.8  F
                 "         R131                              8.9  2.5  F
                 "         R133                              8.9  3.5  F
                 "         R134                              8.1  3.4  F
                 "         R139                              5.6  0.3  F
                 "         R146                              6.0  0.8  F
                 "         R151                              2.9  4.7  F
                 "         R152                              2.9  4.6  F
                 "         R153                              3.5  4.6  F
                 "         R154                              3.5  4.7  F
                 "         R155                              3.5  4.8  F
                 "         R156                              5.6  4.8  F
                 "         R158                              0.9  1.5  F
                 "         R183                              4.5  0.9  F
                 "         R187                              8.7  1.6  F
                 "         R193                              4.5  3.1  F
                 "         R194                              7.1  3.0  F
                 "         R195                              9.4  1.5  F
 17    5      556607      R100     RES,S/M,FILM,.12W,5%,100 KOHM  8.7  1.4  F
                 "         R103                              8.7  1.3  F
                 "         R116                              8.9  3.7  F
                 "         R118                              7.8  1.1  F
                 "         R120                              7.8  1.0  F
 18    45     556629      R77      RES,S/M,FILM,.12W,5%,47 OHM    7.1  4.7  F
                 "         R78                               7.1  4.8  F
                 "         R79                               7.1  4.5  F
                 "         R80                               7.1  4.6  F
                 "         R81                               5.6  1.5  F
                 "         R82                               7.1  4.4  F
                 "         R83                               7.1  4.3  F
                 "         R84                               5.6  1.3  F
                 "         R85                               7.1  4.2  F
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PL# 060538-003      TITLE: PCB ASSY,MAIN,MEM EXP,3400        PAGE 4/9
PL REV: E                                                    09281994
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-------------------------------------------------------------------------
ITEM  QTY/UM   PART NO.   REFDES    DESCRIPTION                 X    Y   F/B
-------------------------------------------------------------------------
               "          R86                                  5.6  1.1  F
               "          R87                                  7.1  4.1  F
               "          R88                                  4.9  1.0  F
               "          R89                                  3.9  1.0  F
               "          R90                                  5.2  1.1  F
               "          R91                                  5.6  1.2  F
               "          R92                                  5.6  1.4  F
               "          R93                                  5.3  1.7  F
               "          R94                                  3.5  4.5  F
               "          R112                                 7.3  1.4  F
               "          R159                                 3.8  4.7  F
               "          R160                                 9.4  1.6  F
               "          R161                                 7.1  5.0  F
               "          R162                                 5.4  4.6  F
               "          R163                                 6.1  4.8  F
               "          R164                                 7.1  4.9  F
               "          R165                                 7.1  3.6  F
               "          R166                                 7.1  3.5  F
               "          R167                                 7.1  3.8  F
               "          R168                                 7.1  3.7  F
               "          R169                                 5.6  1.7  F
               "          R170                                 6.0  1.7  F
               "          R171                                 5.7  3.8  F
               "          R172                                 7.1  2.9  F
               "          R173                                 7.1  2.8  F
               "          R174                                 7.1  2.7  F
               "          R175                                 7.1  2.6  F
               "          R176                                 7.1  2.5  F
               "          R177                                 7.1  2.4  F
               "          R178                                 7.1  2.3  F
               "          R179                                 7.1  3.4  F
               "          R180                                 7.1  3.3  F
               "          R181                                 7.1  3.1  F
               "          R182                                 7.1  3.2  F
               "          R184                                 5.7  4.1  F
               "          R197                                 4.8  3.0  F
 19    1       556640     R198   RES,S/M,FILM,.12W,5%,150 OHM   5.8  3.3  F
 20    5       556648     R34    RES,S/M,FILM,.12W,5%,390 OHM   2.6  4.3  F
               "          R115                                 8.6  3.8  F
               "          R123                                 8.9  3.3  F
               "          R132                                 8.9  3.6  F
               "          R143                                 8.9  2.9  F
 21    1       556651     R189   RES,S/M,FILM,.12W,5%,510 OHM   8.1  2.4  F
 22    8       556658     R4     RES,S/M,FILM,.12W,5%,1.0 KOHM  4.0  2.8  F
               "          R113                                 7.3  1.2  F
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PL# 060538-003      TITLE: PCB ASSY,MAIN,MEM EXP,3400        PAGE 5/9
PL REV: E                                                    09281994
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--------------------------------------------------------------------------
ITEM   QTY/UM    PART NO.    REFDES    DESCRIPTION                X    Y   F/B
--------------------------------------------------------------------------
                    "         R119                              7.6  1.3   F
                    "         R121                              7.6  1.2   F
                    "         R122                              8.1  2.8   F
                    "         R126                              0.2  4.3   F
                    "         R148                              5.0  0.8   F
                    "         R150                              5.2  0.7   F
 23     3       556665        R135    RES,S/M,FILM,.12W,5%,2.0 KOHM  5.4  0.5   F
                    "         R136                              5.8  0.9   F
                    "         R137                              6.0  0.9   F
 24     1       556670        R186    RES,S/M,FILM,.12W,5%,3.3 KOHM  4.9  0.5   F
 25     1       556672        R149    RES,S/M,FILM,.12W,5%,3.9 KOHM  9.2  0.9   F
 26     1       556676        R106    RES,S/M,FILM,.12W,5%,6.2 KOHM  4.6  0.4   F
 27     1       556687        R101    RES,S/M,FILM,.12W,5%,22 KOHM   4.1  0.5   F
 28     1       556690        R138    RES,S/M,FILM,.12W,5%,30 KOHM   9.4  0.9   F
 29     2       556692        R127    RES,S/M,FILM,.12W,5%,36 KOHM   2.8  0.7   F
                    "         R196                              8.5  2.6   F
 30     2       556710        R30     RES,S/M,FILM,.12W,5%,330 KOHM  4.7  4.6   F
                    "         R104                              4.3  0.8   F
 31     1       556712        R140    RES,S/M,FILM,.12W,5%,390 KOHM  5.4  0.9   F
 32     2       556742        R31     RES,S/M,FILM,.12W,5%,9.1 MOHM  4.5  4.6   F
                    "         R73                               6.0  3.4   F
 33     1       556837-029    R147    RES,S/M,FILM,1/8W,1%,200 OHMS  5.8  0.3   F
 34     1       561008        C65     CAP,ALUM,RDL LEAD,50VMIN,100UF 9.2  1.9   F
 35     1       561016-001    C58     CAP,AL,50 V,10000 UF           1.7  1.7   F
 36     1       561302        C60     CAP.ALUM. 15V MIN      220. UF 1.0  0.9   F
 37     1       561908        C53     CAP.AL.R/L 16V         4700. UF 3.5  0.2   F
 38     2       563602        C46     CAP.S/M,TANT,10V MIN+-20%,10UF 4.2  0.4   F
                    "         C54                               6.3  0.1   F
 39     6       563605        C43     CAP.S/M,TANT.35V,20%,1UF       8.2  1.4   F
                    "         C45                               8.3  0.4   F
                    "         C50                               7.3  1.0   F
                    "         C51                               7.3  0.9   F
                    "         C55                               4.0  0.2   F
                    "         C56                               6.3  0.3   F
 40     3       563606        C35     CAP,S/M,TANT,6VMIN,10%,68UF    5.8  5.1   F
                    "         C81                               6.0  1.5   F
                    "         C82                               0.8  2.4   F
 41     38      563700        C1      CAP,S/M,CER,50VMIN,20%,.1 UF   0.6  0.7   F
                    "         C2                                3.8  2.6   F
                    "         C3                                4.8  3.2   F
                    "         C4                                5.0  3.9   F
                    "         C5                                3.8  3.2   F
                    "         C6                                3.8  4.5   F
                    "         C7                                3.6  4.0   F
                    "         C8                                4.5  3.2   F
```

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PL# 060538-003      TITLE: PCB ASSY,MAIN,MEM EXP,3400        PAGE 6/9
PL REV: E                                                    09281994
RUN DATE: Sep 28 07:21:43
--------------------------------------------------------------------------------
ITEM  QTY/UM   PART NO.   REFDES    DESCRIPTION                X    Y   F/B
--------------------------------------------------------------------------------
                 "          C10                               0.6  1.2   F
                 "          C12                               4.2  4.6   F
                 "          C13                               3.2  4.5   F
                 "          C15                               4.2  4.7   F
                 "          C16                               0.6  2.7   F
                 "          C17                               2.2  4.2   F
                 "          C18                               0.6  3.6   F
                 "          C19                               3.4  1.6   F
                 "          C20                               2.2  2.4   F
                 "          C21                               2.9  4.3   F
                 "          C23                               2.5  1.3   F
                 "          C25                               6.8  2.7   F
                 "          C26                               5.6  2.6   F
                 "          C27                               6.0  4.2   F
                 "          C28                               6.6  4.1   F
                 "          C29                               5.1  1.8   F
                 "          C30                               6.2  3.3   F
                 "          C31                               5.4  3.5   F
                 "          C32                               6.2  1.9   F
                 "          C33                               5.3  2.5   F
                 "          C37                               6.5  3.5   F
                 "          C38                               4.6  2.5   F
                 "          C61                               8.9  2.6   F
                 "          C63                               5.4  0.2   F
                 "          C64                               9.2  2.2   F
                 "          C67                               6.0  0.7   F
                 "          C70                               5.2  0.6   F
                 "          C72                               9.2  2.3   F
                 "          C75                               5.7  0.7   F
                 "          C76                               4.0  2.5   F
 42    4      563701        C9    CAP,S/M,CER,50WVDC,5%,10 PF  4.7  4.7   F
                 "          C11                               4.5  4.7   F
                 "          C22                               6.1  3.5   F
                 "          C24                               5.8  3.5   F
 43   10      563702        C68   CAP,S/M,CER,50WVDC,5%,100 PF 4.9  0.6   F
                 "          C96                               5.2  0.5   F
                 "          C99                               5.3  3.2   F
                 "          C100                              7.4  2.6   F
                 "          C101                              7.4  2.7   F
                 "          C102                              7.4  2.8   F
                 "          C103                              7.4  2.9   F
                 "          C104                              7.4  2.5   F
                 "          C105                              7.4  2.4   F
                 "          C106                              7.4  2.3   F
 44    9      563705        C14   CAP,S/M,CER,50VMIN,10%,.01 UF 4.2  4.8  F
```

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PL# 060538-003      TITLE: PCB ASSY,MAIN,MEM EXP,3400       PAGE 7/9
PL REV: E                                                   09281994
RUN DATE: Sep 28 07:21:43
------------------------------------------------------------------------

ITEM  QTY/UM   PART NO.   REFDES    DESCRIPTION                 X    Y  F/B
------------------------------------------------------------------------
              "           C40                                  8.7  1.0  F
              "           C47                                  7.8  0.9  F
              "           C52                                  8.9  3.8  F
              "           C57                                  0.2  4.4  F
              "           C59                                  8.9  3.2  F
              "           C66                                  9.3  1.1  F
              "           C73                                  8.9  2.7  F
              "           C74                                  8.9  3.4  F
 45    2      563715      C44     CAP,S/M,CER,50VMIN,20%,.22 UF 3.8  0.5  F
              "           C49                                  4.6  0.5  F
 46    2      563716      C41     CAP,S/M,CER,50VMIN,5%,.001 UF 8.7  1.2  F
              "           C48                                  7.8  1.4  F
 47    16     563720      C77     CAP,S/M,CER,50VMIN,5%,150 PF  5.0  3.7  F
              "           C78                                  3.6  3.6  F
              "           C79                                  4.5  4.5  F
              "           C80                                  4.2  3.2  F
              "           C83                                  2.2  2.3  F
              "           C84                                  2.9  4.2  F
              "           C85                                  2.4  4.2  F
              "           C86                                  5.3  4.1  F
              "           C87                                  6.0  4.1  F
              "           C88                                  6.6  4.2  F
              "           C89                                  5.4  3.4  F
              "           C90                                  5.3  2.6  F
              "           C91                                  6.5  3.4  F
              "           C92                                  4.6  2.6  F
              "           C93                                  6.2  2.0  F
              "           C94                                  6.2  3.4  F
 48    5      563729      C39     CAP,S/M,CER,50VMIN,10%,1 UF   6.9  0.9  F
              "           C42                                  6.9  0.3  F
              "           C95                                  2.8  0.3  F
              "           C97                                  5.2  0.1  F
              "           C98                                  9.4  1.3  F
 49    2      564133-001  D19     DIODE,SCHOTTKY,60V,3A         6.6  1.0  F
              "           D21                                  6.3  1.0  F
 50    10     564202      D3      DIODE,S/M,TYPE BAS16          2.8  4.5  F
              "           D5                                   3.8  5.0  F
              "           D6                                   8.5  1.1  F
              "           D7                                   3.1  0.7  F
              "           D8                                   3.3  0.7  F
              "           D10                                  7.8  1.5  F
              "           D18                                  5.2  0.4  F
              "           D22                                  5.5  0.6  F
              "           D23                                  5.9  0.5  F
              "           D29                                  5.8  0.2  F
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PL# 060538-003      TITLE: PCB ASSY,MAIN,MEM EXP,3400        PAGE 8/9
PL REV: E                                                    09281994
RUN DATE: Sep 28 07:21:43
------------------------------------------------------------------------
ITEM  QTY/UM   PART NO.   REFDES     DESCRIPTION              X    Y  F/B
------------------------------------------------------------------------
 51    4      564206        D1    DIODE,S/M,TYPE MMBD301     4.4  2.7  F
              "             D2                               4.3  2.7  F
              "             D4                               3.0  4.5  F
              "             D14                              2.5  2.0  F
 52    2      564217        D15   DIODE,S/M TYPE 5231 ZENER,5V  3.5  0.7  F
              "             D28                              9.1  1.3  F
 53    2      564219        D16   DIODE,S/M TYPE 5245 ZENER,15V 3.6  0.7  F
              "             D20                              5.6  0.2  F
 54    1      564235        D9    DIODE,S/M,TYPE 5226,ZENER,3.3V 4.3  0.7  F
 55    2      564238        D26   DIODE,S/M,TYPE BAS21,200VBR  2.4  1.0  F
              "             D27                              2.2  1.0  F
 56    2      564239-001    D12   DIODE,S/M,DUAL,6A,100V      2.3  0.2  F
              "             D13                              2.0  0.2  F
 57    1      565091-001    Q5    XSTR,FET,60V,30A            5.8  0.0  F
 58    3      565101        Q2    TRANS,S/M,NPN,TYPE 4401     3.5  5.0  F
              "             Q9                               8.9  1.3  F
              "             Q10                              9.1  1.5  F
 59    1      565110        Q7    XSTR,S/M,TYPE 6427 DARLINGTON 5.7  0.5  F
 60    2      565111        Q3    TRANSISTOR,S/M,TYPE 2222A,NPN 7.2  1.4  F
              "             Q6                               5.5  0.5  F
 61    1      567024        VR1   VOLTAGE REGULATOR,5V,1A     6.4  0.0  F
 63    1      574079        U24   IC,TYPE UDN2998W,MOTOR DRIVER 8.0  0.0  F
 64    1      578294-001    U26   IC,S/M,DRAM,256KX16,SOJ     2.8  1.9  F
 66    1      578020        U28   IC,S/M,TYPE 74HC04          5.3  4.3  F
 67    1      578023        U5    IC,S/M,TYPE 74HC32          3.2  4.8  F
 68    1      578025        U22   IC,S/M,TYPE LP339           8.2  1.1  F
 69    4      578081        U7    IC,S/M,TYPE 74HCT245        0.6  3.0  F
              "             U10                              0.6  3.9  F
              "             U14                              4.1  2.1  F
              "             U15                              5.2  2.1  F
 70    1      578086        U2    IC,S/M,TYPE 14C88 CMOS DRIVER 0.6  1.8  F
 71    1      578087        U4    IC,S/M,TYPE 14C89,CMOS RCVR  0.6  1.4  F
 72    1      578131        U11   IC,S/M,TYPE IDT72105,FIFO   3.5  2.0  F
 73    1      578132        U30   IC,S/M,TYPE MC145041        8.1  3.7  F
 74    1      578134        U1    IC,S/M,TYPE 75ALS180        0.6  0.9  F
 75    1      578135        U29   IC,S/M,TYPE MC34064         4.0  2.6  F
 76    1      578137        D11   IC,S/M,TYPE LM385-1.2       4.0  0.7  F
 77    1      578145        Y2    CRYSTAL,S/M,24MHZ           6.0  3.8  F
 78    1      060693-001    U13   CONFIG GAL,16V8,DRAM CONTROL 5.3  3.8  F
 79    1      060694-001    U20   CONFIG GAL,16V8,DSACK CONTROL 6.6  3.7  F
 80    1      060692-001    U23   CONFIG GAL,16V8,ASIC STATEMACH 5.9  4.5  F
 81    1      060691-001    U25   CONFIG GAL,16V8,ASIC INTFC  6.6  4.5  F
 82    2      578209-001    U16   IC,S/M,TYPE 74ALS257        4.6  2.2  F
              "             U18                              5.3  2.9  F
 83    1      578211-001    U3    IC,S/M,TYPE MC68332,MICPRCS  4.3  3.8  F
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PL# 060538-003       TITLE: PCB ASSY,MAIN,MEM EXP,3400        PAGE 9/9
PL REV: E                                                     09281994
RUN DATE: Sep 28 07:21:43
----------------------------------------------------------------------------
ITEM   QTY/UM   PART NO.    REFDES      DESCRIPTION               X    Y   F/B
----------------------------------------------------------------------------
 84     2      578245-001   U27      IC,S/M,LM293,DUAL VOLT COMPTR 5.6  0.9   F
               "            U31                                   4.6  0.7   F
 85     7      580231       J3       CONN,26-POSN.HDR.SNGL.ROW/.100 2.4 2.4  F
               "            J4                                    8.4  2.2   F
               "            J6                                    3.4  1.5   F
               "            J8                                    7.3  4.9   F
               "            TP14                                  7.7  2.5   F
               "            TP15                                  8.3  3.0   F
               "            TP18                                  7.8  3.8   F
 86     1      580285       J10      CONN,8-POSN,HDR,.156,FRICTION 2.5  0.7   F
 88     3      580359       J11      CONN.HDR.4-POSN.STRAIGHT THRO. 9.8 3.3  F
               "            J12                                   9.3  3.7   F
               "            J13                                   9.3  2.9   F
 89     1      580434       J1       CONN.25-POSN.D/SUB W/SNAP     0.3  0.6   F
 90     1      581976       J14      CONN,40-POSN,HDR,.1 DBL ROW   9.8  0.4   F
 91     2      581978       J9       CONN,6-POSN,HDR,.100,FRIC LOCK 8.6 0.0   F
               "            J15                                   8.5  2.8   F
 92     2      582065       SW1      SW,8-POSN.DIP,SIDE ACTUATED   0.3  3.3   F
               "            SW2                                   0.3  4.2   F
 93     1      582282-012   J2       CONN,S/M,PIN,.8MMX6MM,80-POSN 5.2  1.5   F
 94     1      585635-001   L1       INDUCTOR,TOROID,22UH,5A       8.5  1.8   F
 95     1      586298       BT1      HLDR.BATTERY,AA SIZE          1.5  4.7   F
 96     1      586548-001   Q8       SENSOR,S/M,REFLECTIVE         9.0  4.0   F
 97     1      588000       Y1       CRYSTAL,S/M 32.768 KHZ        4.6  4.9   F
 98     2      556605       R97      RES,S/M,FILM,.12W,5%,47 KOHM  9.0  1.7   F
               "            R110                                  8.2  1.2   F
 99     1      550240       R199     RES.CARB. .25W  5%   4.7   OHM
100     1      560712       C107     CAP.CER.100V MIN 10%   .01  UF
101   0.001    520143                ADH,CYANOACRYLATE,GAP FILLING
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# *3400C Main PCB Assembly*

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PL# 066070-007      TITLE: PCB ASSY,MAIN,3400              PAGE 1/2
PL REV: J                                                  07291998
RUN DATE: Jul 29 10:38:53
------------------------------------------------------------------------------
ITEM  QTY/UM   PART NO.   REFDES    DESCRIPTION               X    Y   F/B
------------------------------------------------------------------------------
  1     1      066071-003           PCB SUBASSY,MACH BLD,066070
  2  0.001 RL  046766               LBL.STK..23HX1.50L,4-HI.4MIL.
  3     3      505312               SCREW,PHM,PHIL 4-40X.25 LK STP
                          "
                          "
  4     2      586142               INS.SHIM
                          "
  5     2      507846               SPACER.235 RD.NY.SHOULDER TYPE
                          "
  6     1      065527-003           HEATSINK,PCB DRIVERS
  7     2      521011               RIVET,POP AL.,.094DIA X .375
                          "
  8     8      586250               SPACER,COMP.,.187X.063X.20
  9     4      580213               CONN.2-POSN.SHORTING,.10 CTRS.
100     1      550660      R21       RES.CARB 1.00W  5%   33.0   OHM  0.5  4.4  F
101     2      550694      R41       RES.CARB 1.00W  5% 820.0   OHM  3.5  1.1  F
                          R206                                       9.1  1.7  F
102     1      550700      R42       RES.CARB 1.00W  5%    1.5  KOHM  3.5  1.4  F
103     1      555450      R1        RES.POT.SIDE ADJ.W/KNOB 10KOHM  0.4  4.8  F
104     1      561016-001  C16       CAP,AL,50 V,10000 UF            2.0  1.9  F
105     1      561302      C15       CAP.ALUM. 15V MIN      220. UF  1.5  1.1  F
106     1      561807      C146      CAP.ALUMINUM,ELEC.R/L,25V 330   9.6  2.0  F
107     1      561908      C29       CAP,ACITOR,ALUM,16V,R/L,4700UF  3.8  0.4  F
108     1      565091-001  Q3        XSTR,FET,60V,30A                6.1  0.2  F
109     1      567024      VR1       VOLTAGE REGULATOR,5V,1A         6.8  0.2  F
110     1      574112-001  U27       IC,TYPE L298,SOL/MOTOR DRVR     8.0  0.5  F
111     1      580285      J4        CONN,8-POSN,HDR,.156,FRICTION   2.9  0.9  F
112     3      580359      J13       CONN.HDR.4-POSN.STRAIGHT THRO.  9.6  2.7  F
                          J14                                       9.6  4.0  F
                          J16                                      10.2  3.5  F
113     1      580434      J1        CONN.25-POSN.D/SUB W/SNAP       0.7  0.8  F
114     1      581976      J15       CONN,40-POSN,HDR,.1 DBL ROW    10.2  0.6  F
115     2      581978      J10       CONN,6-POSN,HDR,.100,FRIC LOCK  8.2  2.7  F
                          J12                                       9.1  0.2  F
116     2      582065      SW1       SW,8-POSN.DIP,SIDE ACTUATED     0.1  3.5  F
                          SW2                                       0.1  4.5  F
117     1      582098      SW3       SWITCH,PUSHBTN.,RT.ANG.MTG.     0.6  3.7  F
118     3      584274      XU6       SOC,32POSN,DIP LOW PROFILE      1.5  4.3  F
                          XU7                                       2.3  4.3  F
                          XU8                                       3.2  4.3  F
119     1      585636-001  L1        INDUCTOR,10 UH                 9.2  1.2  F
120     1      586298      BT1       HLDR.BATTERY,AA SIZE           1.9  4.9  F
121     3      580231                CONN,26-POSN,HDR,1-ROW,.1,.230
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PL# 066070-007        TITLE: PCB ASSY,MAIN,3400              PAGE 2/2
PL REV: J                                                    07291998
RUN DATE: Jul 29 10:38:53
-----------------------------------------------------------------------------
ITEM  QTY/UM   PART NO.    REFDES    DESCRIPTION              X    Y   F/B
-----------------------------------------------------------------------------
122    6       589024-001   C26      CAP,CER,Z5U,100V,80/20%,1UF  3.3  0.4   F
               "            C75                                   5.7  0.4   F
               "            C83                                   5.6  0.4   F
               "            C122                                  8.3  1.4   F
               "            C123                                  8.1  1.4   F
               "            C150                                  9.9  1.1   F
123    1       590427-001   D43      DIODE,TYPE IN4744,ZENER,1W,5%  4.5  0.9  F
124    1       590449-001   C152     CAP,AL,R/L,25V,10UF,20%       4.3  0.6   F
125    1       581977       J11      CONN,8-POSN,HDR,.100,FRIC LOCK 9.1  2.0  F
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# *3400C PCB Subassembly*

```
PL# 066071-003      TITLE: PCB SUBASSY,MACH BLD,066070        PAGE 1/9
PL REV: F                                                     07291998
RUN DATE: Jul 29 10:41:56
---------------------------------------------------------------------------
ITEM  QTY/UM  PART NO.   REFDES    DESCRIPTION                X    Y   F/B
---------------------------------------------------------------------------
  1    1      066069-004           PCB,MAIN,3400
 10    58     556629      R46      RES,S/M,FILM,.12W,5%,47 OHM  4.0  4.4   F
              "           R47                                   4.0  4.6   F
              "           R48                                   4.0  4.7   F
              "           R72                                   5.4  1.2   F
              "           R75                                   5.4  4.7   F
              "           R76                                   5.6  3.6   F
              "           R77                                   5.6  3.8   F
              "           R78                                   5.6  4.2   F
              "           R79                                   5.6  4.4   F
              "           R80                                   5.6  4.7   F
              "           R82                                   7.1  4.1   F
              "           R85                                   6.0  3.6   F
              "           R86                                   6.0  4.2   F
              "           R89                                   6.0  3.9   F
              "           R90                                   6.1  4.2   F
              "           R100                                  6.6  3.9   F
              "           R106                                  6.8  3.9   F
              "           R107                                  6.8  4.0   F
              "           R109                                  6.8  4.8   F
              "           R110                                  6.8  4.9   F
              "           R118                                  7.0  3.9   F
              "           R122                                  7.1  4.0   F
              "           R123                                  7.1  4.2   F
              "           R124                                  7.1  4.3   F
              "           R125                                  7.1  4.4   F
              "           R126                                  7.1  4.6   F
              "           R129                                  7.2  1.8   F
              "           R130                                  7.2  1.9   F
              "           R131                                  7.2  2.5   F
              "           R132                                  7.2  2.8   F
              "           R133                                  7.2  2.9   F
              "           R134                                  7.2  3.0   F
              "           R135                                  7.2  3.1   F
              "           R137                                  7.2  2.7   F
              "           R140                                  7.5  4.3   F
              "           R141                                  7.5  4.4   F
              "           R142                                  7.5  4.5   F
              "           R143                                  7.5  4.6   F
              "           R144                                  7.5  4.7   F
              "           R145                                  7.5  4.8   F
              "           R146                                  7.5  4.9   F
              "           R147                                  7.5  5.0   F
              "           R149                                  7.5  3.7   F
              "           R150                                  7.5  3.8   F
              "           R151                                  7.5  3.9   F
              "           R152                                  7.5  4.0   F
              "           R153                                  7.7  1.2   F
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PL# 066071-003      TITLE: PCB SUBASSY,MACH BLD,066070        PAGE 2/9
PL REV: F                                                     07291998
RUN DATE: Jul 29 10:41:56
-------------------------------------------------------------------------------
 ITEM  QTY/UM   PART NO.   REFDES    DESCRIPTION                     X    Y   F/B
-------------------------------------------------------------------------------
                    "        R155                                   7.8  1.2   F
                    "        R157                                   7.9  1.2   F
                    "        R159                                   8.0  1.2   F
                    "        R162                                   7.4  3.5   F
                    "        R163                                   7.9  3.5   F
                    "        R164                                   7.5  3.5   F
                    "        R165                                   8.1  3.5   F
                    "        R171                                   7.4  3.3   F
                    "        R172                                   6.9  3.6   F
                    "        R232                                   4.7  1.2   F
                    "        R240                                   4.5  5.2   F
  11    1     556640         R92    RES,S/M,FILM,.12W,5%,150 OHM     6.3  3.3   F
  12    7     556643         R11    RES,S/M,FILM,.12W,5%,240 OHM     0.9  0.9   F
                    "        R12                                    0.9  1.0   F
                    "        R14                                    0.9  1.4   F
                    "        R15                                    0.9  1.5   F
                    "        R16                                    0.9  1.8   F
                    "        R17                                    0.9  1.9   F
                    "        R18                                    0.9  2.0   F
  13    3     556648         R33    RES,S/M,FILM,.12W,5%,390 OHM     3.0  5.1   F
                    "        R154                                   7.5  1.2   F
                    "        R190                                   8.8  4.1   F
  14    3     556650         R52    RES,S/M,FILM,.12W,5%,470 OHM     6.2  1.8   F
                    "        R197                                   9.7  2.4   F
                    "        R202                                   9.1  3.6   F
  15    7     556658         R39    RES,S/M,FILM,.12W,5%,1.0 KOHM    3.2  4.5   F
                    "        R102                                   5.8  2.3   F
                    "        R103                                   6.6  1.1   F
                    "        R105                                   6.8  1.6   F
                    "        R138                                   7.2  0.8   F
                    "        R216                                   9.3  3.7   F
                    "        R208                                   9.3  2.6   F
  16    2     556665         R156   RES,S/M,FILM,.12W,5%,2.0 KOHM    7.4  1.2   F
                    "        R182
  17    1     556672         R119   RES,S/M,FILM,.12W,5%,3.9 KOHM    6.8  0.8   F
  18    2     556674         R97    RES,S/M,FILM,.12W,5%,5.1 KOHM    6.5  1.1   F
                    "        R120                                   7.1  1.6   F
  19    1     556676         R68    RES,S/M,FILM,.12W,5%,6.2 KOHM    5.3  0.8   F
  20    6     556686         R13    RES,S/M,FILM,.12W,5%,20 KOHM     0.9  1.2   F
                    "        R20                                    0.9  2.3   F
                    "        R245                                   1.6  1.4   F
                    "        R246                                   1.6  1.2   F
                    "        R247                                   1.6  1.3   F
                    "        R248                                   1.5  1.5   F
  21    1     556687         R58    RES,S/M,FILM,.12W,5%,22 KOHM     4.8  1.0   F
  22    1     556690         R222   RES,S/M,FILM,.12W,5%,30 KOHM     9.8  1.5   F
  23    2     556692         R37    RES,S/M,FILM,.12W,5%,36 KOHM     3.2  0.9   F
                    "        R167                                   8.3  2.5   F
  24    1     556695         R173   RES,S/M,FILM,.12W,5%,51 KOHM     5.5  1.2   F
  25    2     556710         R62    RES,S/M,FILM,.12W,5%,330 KOHM    4.9  1.2   F
                    "        R64                                    5.0  4.9   F
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------------------------------------------------------------------------
ITEM   QTY/UM   PART NO.    REFDES      DESCRIPTION              X     Y   F/B
------------------------------------------------------------------------
 26     1      556721        R69    RES,S/M,FILM,.12W,5%,1.0 MOHM  5.3  1.2   F
 27     2      556742        R60    RES,S/M,FILM,.12W,5%,9.1 MOHM  4.8  4.9   F
               "             R95                                  6.4  3.3   F
 28     3      556811        R209   RES,S/M,FILM,.12W,1%,10 KOHM   9.3  2.7   F
               "             R217                                 9.3  3.8   F
               "             R226                                 9.8  3.3   F
 29     8      556815        R121   RES,S/M,FILM,.12W,1%,100KOHM   6.9  1.2   F
               "             R136                                 7.0  0.8   F
               "             R186                                 8.8  3.6   F
               "             R198                                 9.1  2.5   F
               "             R203                                 9.1  3.7   F
               "             R212                                 9.3  3.2   F
               "             R219                                 9.6  3.2   F
               "             R192                                 8.8  2.5   F
 30     4      556837-001    R166   RES,S/M,FILM,1/8W,1%,100 OHMS  8.1  2.5   F
               "             R174                                 8.3  1.8   F
               "             R175                                 8.1  2.4   F
               "             R176                                 8.3  1.7   F
 31     3      556837-067    R180   RES,S/M,FILM,1/8W,1%,499 OHMS  8.5  3.9   F
               "             R183                                 8.6  2.7   F
               "             R201                                 9.1  3.3   F
 32     8      556837-095    R139   RES,S/M,FILM,1/8W,1%,1 KOHMS   7.2  1.0   F
               "             R148                                 7.2  0.8   F
               "             R168                                 6.2  0.8   F
               "             R169                                 6.2  0.6   F
               "             R188                                 8.8  3.9   F
               "             R193                                 8.8  2.7   F
               "             R210                                 9.3  3.0   F
               "             R213                                 9.3  3.3   F
 33     2      556837-124    R187   RES,S/M,FILM,1/8W,1%,2000 OHMS 8.8  3.7   F
               "             R200                                 9.1  3.2   F
 34     2      556837-161    R177   RES,S/M,FILM,1/8W,1%,4.99KOHMS 6.1  0.6   F
               "             R178                                 6.3  0.6   F
 35     3      556837-258    R189   RES,S/M,FILM,1/8W,1%,51.1KOHMS 8.8  4.0   F
               "             R194                                 8.8  2.8   F
               "             R214                                 9.3  3.5   F
 36     6      556837-311    R170   RES,S/M,FILM,1/8W,1%,10.0 OHM  6.4  0.6   F
               "             R181                                 6.1  0.4   F
               "             R195                                 8.9  1.0   F
               "             R199                                 9.1  2.7   F
               "             R204                                 9.1  3.9   F
               "             R220                                 9.6  3.3   F
 37     2      556840-001    R10    RES,S/M,FILM,DUAL NET,100 OHM  0.9  2.5   F
               "             R108                                 7.4  0.7   F
 38    27      556840-002    R2     RES,S/M,FILM,DUAL NET,10 KOHM  0.6  3.0   F
               "             R3                                   0.6  3.1   F
               "             R4                                   0.6  3.2   F
               "             R5                                   0.6  3.3   F
               "             R6                                   0.6  3.9   F
               "             R7                                   0.6  4.0   F
               "             R8                                   0.6  4.1   F
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PL# 066071-003      TITLE: PCB SUBASSY,MACH BLD,066070          PAGE 4/9
PL REV: F                                                       07291998
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--------------------------------------------------------------------------------
ITEM  QTY/UM   PART NO.   REFDES   DESCRIPTION                   X    Y   F/B
--------------------------------------------------------------------------------
                 "          R9                                  0.6  4.2  F
                 "          R22                                 1.3  2.9  F
                 "          R23                                 1.3  3.0  F
                 "          R24                                 1.3  3.1  F
                 "          R25                                 1.3  3.2  F
                 "          R26                                 1.3  3.8  F
                 "          R27                                 1.3  3.9  F
                 "          R28                                 1.3  4.0  F
                 "          R29                                 1.3  4.1  F
                 "          R49                                 4.2  4.8  F
                 "          R54                                 4.3  3.5  F
                 "          R57                                 4.5  4.8  F
                 "          R63                                 5.0  3.6  F
                 "          R91                                 6.2  4.3  F
                 "          R93                                 6.2  4.0  F
                 "          R94                                 6.4  4.9  F
                 "          R99                                 6.5  5.1  F
                 "          R112                                6.7  1.0  F
                 "          R113                                6.9  3.2  F
                 "          R161                                7.9  3.2  F
 39     4    556841-039    R228     RES,S/M,FILM,1/16W,1%,47.5 OHM  5.4  3.6  F
                 "          R229                                5.3  3.6  F
                 "          R230                                5.2  3.5  F
                 "          R231                                5.5  3.8  F
 40     4    556841-087    R66      RES,S/M,FILM,1/16W,1%,4.75KOHM  5.1  3.5  F
                 "          R70                                 5.3  3.6  F
                 "          R73                                 5.4  3.7  F
                 "          R74                                 5.5  3.8  F
 41    24    556841-095    R30      RES,S/M,FILM,1/16W,1%,10 KOHM  5.9  2.9  F
                 "          R31                                 5.9  3.0  F
                 "          R32                                 6.4  3.8  F
                 "          R35                                 7.3  3.5  F
                 "          R43                                 1.5  1.3  F
                 "          R50                                 1.5  1.3  F
                 "          R61                                 1.4  2.0  F
                 "          R71                                 1.5  2.0  F
                 "          R81                                 2.2  3.4  F
                 "          R83                                 2.2  3.4  F
                 "          R84                                 3.1  4.6  F
                 "          R96                                 5.4  4.8  F
                 "          R127                                4.6  1.2  F
                 "          R128                                5.4  1.3  F
                 "          R184                                6.0  1.8  F
                 "          R234                                7.1  1.9  F
                 "          R235                                6.6  1.9  F
                 "          R236                                6.1  4.7  F
                 "          R237                                5.9  2.3  F
                 "          R239                                3.4  5.3  F
                 "          R241                                6.4  1.9  F
                 "          R242                                6.4  1.8  F
                 "          R243                                5.7  1.1  F
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PL# 066071-003      TITLE: PCB SUBASSY,MACH BLD,066070        PAGE 5/9
PL REV: F                                                     07291998
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------------------------------------------------------------------------
ITEM   QTY/UM   PART NO.   REFDES      DESCRIPTION              X    Y  F/B
------------------------------------------------------------------------
                    "        R244                             5.7  1.1   F
 42      2      563602       C62    CAP.S/M,TANT,10V MIN+-20%,10UF  5.1  1.0  F
                    "        C88                              6.8  0.4   F
 43      2      563605       C42    CAP,S/M,TANT,35V,20%,1UF    4.4  0.4   F
                    "        C89                              6.8  0.6   F
 44      3      563606       C14    CAP,S/M,TANT,6VMIN,10%,68UF 1.5  2.4   F
                    "        C73                              5.6  3.1   F
                    "        C85                              6.2  5.1   F
 45      3      563701       C56    CAP,S/M,CER,50WVDC,5%,10 PF 4.8  5.0   F
                    "        C86                              6.2  3.3   F
                    "        C101                             6.7  3.2   F
 46      6      563702       C112   CAP,S/M,CER,50WVDC,5%,100 PF 7.4  2.5  F
                    "        C113                             7.4  2.8   F
                    "        C114                             7.4  2.9   F
                    "        C115                             7.4  3.0   F
                    "        C116                             7.4  3.1   F
                    "        C117                             7.5  2.7   F
 47      3      563705       C1     CAP,S/M,CER,50VMIN,10%,.01 UF 0.6  4.6 F
                    "        C49                              4.6  5.1   F
                    "        C143                             9.3  4.0   F
 48      1      563709       C61    CAP,S/M,CER,50VMIN,5%,22 PF 5.0  5.0   F
 49      9      563711       C132   CAP,S/M,CER,50VMIN,10%,.1 UF 8.8  3.8  F
                    "        C133                             8.8  2.6   F
                    "        C135                             9.1  2.6   F
                    "        C136                             9.1  2.8   F
                    "        C138                             9.1  3.8   F
                    "        C139                             9.1  4.0   F
                    "        C141                             9.3  3.2   F
                    "        C144                             9.6  3.2   F
                    "        C145                             9.6  3.5   F
 50      3      563715       C55    CAP,S/M,CER,50VMIN,20%,.22 UF 4.8  0.9 F
                    "        C71                              5.4  0.8   F
                    "        C148                             9.8  1.5   F
 51      4      563716       C6     CAP,S/M,CER,50VMIN,5%,.001 UF 0.9  1.1 F
                    "        C140                             9.3  2.8   F
                    "        C142                             9.3  3.9   F
                    "        C149                             9.8  3.5   F
 52      1      563721       C109   CAP,S/M,CER,50VMIN,5%,2200 PF 6.9  0.8 F
 53      1      563731       C134   CAP,S/M,CERM,.001UF,200V,X7R 8.9  1.1  F
 54     60      563735       C10    CAP,S/M,CER,0603,25V,0.1UF  1.2  3.3   F
                    "        C11                              1.3  4.2   F
                    "        C12                              1.3  1.5   F
                    "        C13                              1.5  2.3   F
                    "        C17                              2.3  5.3   F
                    "        C18                              3.1  4.4   F
                    "        C21                              3.2  1.6   F
                    "        C24                              3.2  2.3   F
                    "        C25                              3.2  2.6   F
                    "        C27                              3.3  0.9   F
                    "        C28                              3.3  4.5   F
                    "        C31                              3.8  5.3   F
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PL# 066071-003       TITLE: PCB SUBASSY,MACH BLD,066070        PAGE 6/9
PL REV: F                                                      07291998
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-------------------------------------------------------------------------------
ITEM  QTY/UM    PART NO.   REFDES    DESCRIPTION                 X    Y   F/B
-------------------------------------------------------------------------------
                "          C32                                  3.9  4.3   F
                "          C34                                  4.0  4.7   F
                "          C37                                  4.1  3.8   F
                "          C38                                  4.1  1.3   F
                "          C39                                  4.1  4.0   F
                "          C40                                  4.1  4.3   F
                "          C41                                  7.2  0.4   F
                "          C43                                  6.4  1.7   F
                "          C44                                  6.4  1.8   F
                "          C46                                  4.5  3.6   F
                "          C47                                  4.6  4.9   F
                "          C48                                  4.6  4.9   F
                "          C50                                  4.7  3.3   F
                "          C51                                  4.7  2.6   F
                "          C53                                  4.7  3.6   F
                "          C54                                  4.7  4.8   F
                "          C58                                  4.9  3.6   F
                "          C59                                  4.9  4.8   F
                "          C60                                  4.9  3.2   F
                "          C63                                  5.3  5.1   F
                "          C64                                  5.3  3.8   F
                "          C65                                  5.3  4.1   F
                "          C66                                  5.3  4.3   F
                "          C67                                  5.3  4.7   F
                "          C72                                  5.4  2.6   F
                "          C74                                  5.7  1.2   F
                "          C76                                  5.9  4.0   F
                "          C77                                  6.0  4.4   F
                "          C78                                  6.0  4.9   F
                "          C79                                  6.0  2.6   F
                "          C87                                  6.2  4.2   F
                "          C90                                  6.5  3.2   F
                "          C92                                  6.6  0.8   F
                "          C94                                  6.5  2.1   F
                "          C95                                  6.6  4.8   F
                "          C98                                  6.6  4.0   F
                "          C99                                  7.6  2.0   F
                "          C100                                 6.9  1.8   F
                "          C102                                 7.3  1.4   F
                "          C104                                 7.0  3.2   F
                "          C105                                 7.0  4.5   F
                "          C106                                 6.9  1.6   F
                "          C108                                 7.1  2.7   F
                "          C119                                 7.5  1.0   F
                "          C120                                 6.5  0.8   F
                "          C121                                 7.5  1.0   F
                "          C130                                 9.0  3.1   F
                "          C151                                 9.9  2.6   F
 55     4    563736-001    C125      CAP,S/M,CER,0603,25V,.01UF  8.1  1.8   F
                "          C126                                 8.1  1.7   F
                "          C131                                 8.5  1.6   F
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--------------------------------------------------------------------------
ITEM  QTY/UM   PART NO.   REFDES    DESCRIPTION               X    Y  F/B
--------------------------------------------------------------------------
               "          C147                               9.7  1.2  F
 56    31      563737-001  C2     CAP,S/M,CER,0603,50V,150PF  0.9  1.5  F
               "          C3                                 0.9  1.6  F
               "          C4                                 0.9  2.0  F
               "          C5                                 0.9  2.2  F
               "          C7                                 1.1  0.9  F
               "          C8                                 1.1  1.0  F
               "          C9                                 1.1  1.5  F
               "          C19                                3.1  4.5  F
               "          C20                                3.2  1.5  F
               "          C22                                3.2  2.3  F
               "          C23                                3.2  2.6  F
               "          C30                                3.9  5.3  F
               "          C33                                4.0  4.3  F
               "          C35                                4.1  4.0  F
               "          C36                                4.1  4.3  F
               "          C45                                4.5  3.5  F
               "          C52                                4.7  3.5  F
               "          C57                                4.9  3.5  F
               "          C68                                5.3  3.8  F
               "          C69                                5.4  4.1  F
               "          C70                                5.4  4.3  F
               "          C80                                5.9  4.0  F
               "          C81                                6.0  4.4  F
               "          C82                                6.0  4.9  F
               "          C84                                6.2  4.2  F
               "          C91                                6.5  3.2  F
               "          C93                                6.5  2.0  F
               "          C96                                6.6  4.9  F
               "          C97                                6.6  4.0  F
               "          C107                               7.1  4.5  F
               "          C129                               6.4  3.9  F
 57     1      563740-002  C124   CAP,S/M,0603,NPO,50V,100PF  6.3  0.9  F
 58     4      564206      D9     DIODE,S/M,TYPE MMBD301      3.3  5.2  F
               "          D14                                4.2  5.1  F
               "          D15                                4.3  5.1  F
               "          D16                                4.5  5.1  F
 59     2      564217      D12    DIODE,S/M 5231 ZENER,5V     3.8  0.9  F
               "          D23                                7.4  1.0  F
 60     2      564219      D32    DIODE,S/M TYPE 5245 ZENER,15V 5.8 0.3 F
               "          D34                                5.8  0.5  F
 61     1      564235      D17    DIODE,S/M,TYPE 5226,ZENER,3.3V 4.4 1.1 F
 62    14      564238      D5     DIODE,S/M,TYPE BAS21,200VBR 2.8  1.2  F
               "          D8                                 2.9  1.2  F
               "          D10                                3.3  4.8  F
               "          D11                                3.3  5.3  F
               "          D18                                4.7  0.8  F
               "          D19                                4.9  0.8  F
               "          D21                                7.6  0.7  F
               "          D22                                7.7  0.7  F
               "          D24                                6.4  0.4  F
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PL# 066071-003      TITLE: PCB SUBASSY,MACH BLD,066070          PAGE 8/9
PL REV: F                                                       07291998
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------------------------------------------------------------------------------
ITEM  QTY/UM    PART NO.   REFDES    DESCRIPTION                 X    Y  F/B
------------------------------------------------------------------------------
                  "          D26                                6.2  0.4  F
                  "          D28                                6.0  0.7  F
                  "          D29                                5.8  0.7  F
                  "          D30                                6.0  0.3  F
                  "          D42                                4.4  0.9  F
 63    3       564239-002    D2      DIODE,S/M,DUAL,6A,200V      2.0  0.4  F
                  "          D4                                 2.8  0.4  F
                  "          D39                                9.4  0.9  F
 64    7       565101        Q1      XSTR,S/M,4401,NPN           3.3  5.0  F
                  "          Q2                                 6.4  1.6  F
                  "          Q4                                 6.8  1.0  F
                  "          Q5                                 7.0  1.0  F
                  "          Q8                                 8.6  2.4  F
                  "          Q10                                8.9  3.3  F
                  "          Q11                                9.1  3.0  F
 65    1       565102        Q7      XSTR,S/M,4403,PNP           6.0  0.8  F
 66    1       565110        Q9      XSTR,S/M,TYPE 6427 DARLINGTON 6.0 0.5 F
 67    1       565127-001    Q6      XSTR,S/M,T5551,NPN,160V     6.4  0.8  F
 68    1       066890-001    U23     CONFIG PAL,EPM7032,DSACK,3400C 6.6 4.4 F
 69    1       578020        U28     IC,S/M,74HC04,HEX INVERTER  6.2  3.8  F
 70    1       578025        U29     IC,S/M,LP 339,QUAD COMPARATOR 8.8 3.0 F
 71    6       578081        U1      IC,S/M,OCT TRISTATE XCVR    0.9  3.1  F
                  "          U2                                 1.0  4.0  F
                  "          U12                                4.4  2.4  F
                  "          U13                                4.4  3.0  F
                  "          U16                                5.2  2.4  F
                  "          U17                                5.2  3.0  F
 72    1       578086        U4      IC,S/M,TYPE 14C88 CMOS DRIVER 1.2 1.7 F
 73    1       578087        U5      IC,S/M,TYPE 14C89,CMOS RCVR 1.2  2.2  F
 74    1       578132        U21     IC,S/M,MC145041,8-BIT A/D   6.1  1.3  F
 75    1       578134        U3      IC,S/M,TYPE 75ALS180        1.2  1.2  F
 76    1       578135        U10     IC,S/M,MC34064,OV/UNO-V PROT 3.5 4.5  F
 77    1       578137        D20     IC,S/M,LM385-1.2,FXD V REF  5.1  0.8  F
 78    1       578145        Y2      CRYSTAL,S/M,24MHZ           6.7  3.5  F
 79    1       578162        U30     IC,S/M,7S32,OR GATE         3.0  5.3  F
 80    3       578209-001    U18     IC,S/M,74ALS257,QUAD 2TO1 DATA 5.8 3.8 F
                  "          U19                                5.8  4.3  F
                  "          U20                                5.8  4.8  F
 81    1       578211-001    U14     IC,S/M,MICPRCS,MC68332,16MHZ 4.7 4.2  F
 82    1       066888-001    U26     CONFIG GAL,16V8,MOTOR CONTROL 7.6 1.8 F
 83    3       578245-001    U15     IC,S/M,LM293,DUAL VOLT COMPTR 5.1 1.2 F
                  "          U24                                6.8  1.8  F
                  "          U25                                7.2  1.2  F
 84    1       582282-012    J5      CONN,S/M,PIN,.8MMX6MM,80-POSN 5.5 1.7 F
 85    1       586548-001    Q12     SENSOR,S/M,REFLECTIVE       9.4  4.2  F
 86    1       588000        Y1      CRYSTAL,S/M 32.768 KHZ      4.9  5.1  F
 87    3       589149-001    FL1     FILTER,S/M,FERRITE,0603,220 OH 9.1 3.5 F
                  "          FL2                                9.1  2.9  F
                  "          FL3                                9.8  3.5  F
 88    8       589831-001    D25     DIODE,S/M,RECT,UFAST,50V,1A 8.2  0.5  F
                  "          D27                                8.4  0.5  F
```

*3400 Bar Code Label Printer Maintenance Manual*

```
PL# 066071-003      TITLE: PCB SUBASSY,MACH BLD,066070        PAGE 9/9
PL REV: F                                                     07291998
RUN DATE: Jul 29 10:41:56
-------------------------------------------------------------------------------
ITEM  QTY/UM   PART NO.   REFDES     DESCRIPTION               X    Y  F/B
-------------------------------------------------------------------------------
               "          D31                                 8.8  0.5  F
               "          D33                                 8.9  0.5  F
               "          D35                                 9.1  0.5  F
               "          D36                                 9.3  0.5  F
               "          D37                                 9.5  0.5  F
               "          D41                                 9.6  0.5  F
 89    2       590205-001 R104       RES,S/M,PWR,2W,1%,1 OHM   7.8  0.9  F
               "          R111                                8.5  0.9  F
 90    1       066889-001 U11        CONFIG GAL,16V8,ROMCS,3400C 3.6 5.0 F
 91    1       578294-001 U9         IC,S/M,DRAM,256KX16,SOJ   3.5  2.2  F
 92    1       062698-001 U22        IC,ASIC,THERM COMPEN II PLCC 6.6 2.7 F
 93    4       551800     R34        RES,S/M,0 OHM JUMPER,1206 3.1  1.8  F
               "          R45                                 3.9  1.8  F
               "          R117                                7.2  1.6  F
               "          R238                                3.9  5.1  F
 94    2       556602     R185       RES.S/M FILM,.12W,5% 220 OHM 8.8 3.5 F
               "          R211                                9.3  3.0  F
 95    14      556603     R36        RES.S/M,FILM,.12W,5% 4.7 KOHM 3.2 0.8 F
               "          R51                                 6.1  1.8  F
               "          R55                                 4.4  4.8  F
               "          R56                                 4.4  4.9  F
               "          R59                                 4.8  1.2  F
               "          R65                                 5.2  4.9  F
               "          R67                                 5.3  4.9  F
               "          R87                                 6.0  4.7  F
               "          R88                                 6.1  3.3  F
               "          R101                                6.6  4.9  F
               "          R114                                3.7  5.3  F
               "          R158                                7.6  1.2  F
               "          R179                                8.5  2.9  F
               "          R221                                9.8  1.4  F
 96    3       556604     R19        RES,S/M,FILM,.12W,5%,10 KOHM 0.9 2.2 F
               "          R40                                 8.8  2.3  F
               "          R225                                9.8  3.2  F
 97    2       556605     R53        RES,S/M,FILM,.12W,5%,47 KOHM 6.2 1.8 F
               "          R160                                6.5  0.6  F
 98    2       556607     R196       RES,S/M,FILM,.12W,5%,100 KOHM 9.1 2.3 F
               "          R205                                9.1  4.1  F
 99    2       556609     R98        RES,S/M,FILM,.12W,5%,270 KOHM 6.5 1.8 F
               "          R116                                6.9  1.6  F
126    3       563733     C127       CAP,S/M,CERM,1UF,25V,Y5V  8.5  3.8  F
               "          C128                                8.6  2.6  F
               "          C137                                9.1  3.2  F
127    1       556646     R191       RES,S/M,FILM,.12W,5%,330 OHM 8.8 2.4 F
```

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# 3400B/3400C Memory Expansion Card Assembly (2M)

```
PL# 060720-001      TITLE: PCB ASSY,2MB MEMORY,3400            PAGE 1/1
PL REV: C                                                      123199
RUN DATE: Nov 18 14:48:00
-------------------------------------------------------------------------------
ITEM  QTY/UM   PART NO.   REFDES     DESCRIPTION                X    Y   F/B
-------------------------------------------------------------------------------
  1     1      060463-002            PCB,MEM EXP,3400
  2   0.001 RL 046766               LBL.STK..23HX1.50L,4-HI.4MIL.
  3     7      556629       R1       RES,S/M,FILM,.12W,5%,47 OHM  0.9  1.6  F
               "            R2                                    0.9  1.5  F
               "            R5                                    1.1  1.2  F
               "            R6                                    0.9  1.2  F
               "            R7                                    0.9  1.8  F
               "            R8                                    0.9  1.4  F
               "            R9                                    0.9  1.5  F
  4     1      556658       R3       RES,S/M,FILM,.12W,5%,1.0 KOHM 0.5 1.8  F
  5     1      563601       C31      CAP.S/M,TANT 10V MIN+-20%4.7UF 2.3 1.3 F
  6     2      563614       C25      CAP,S/M,TANT,33UF,16V,20%    2.7  0.6  F
               "            C30                                   2.8  1.0  F
  7    11      563700       C3       CAP,S/M,CER,50VMIN,20%,.1 UF 1.3  2.7  F
               "            C8                                    2.8  4.7  F
               "            C11                                   2.8  4.2  F
               "            C12                                   0.8  2.2  F
               "            C15                                   2.8  2.9  F
               "            C17                                   2.2  2.2  F
               "            C20                                   2.8  3.6  F
               "            C21                                   0.3  2.8  F
               "            C22                                   1.6  2.7  F
               "            C26                                   1.3  1.2  F
               "            C28                                   2.8  2.2  F
  8     6      563720       C16      CAP,S/M,CER,50VMIN,5%,150 PF 0.8  2.5  F
               "            C18                                   2.2  2.5  F
               "            C23                                   0.3  2.6  F
               "            C24                                   1.6  2.6  F
               "            C27                                   1.2  1.2  F
               "            C29                                   3.1  2.6  F
  9     1      564239-001   D1       DIODE,S/M,DUAL,6A,100V       2.4  0.9  F
 10     1      578166-001   U9       IC,S/M,FLASH EPROM,1M X 8,STD 3.0 4.2  F
 11     1      578166-002   U8       IC,S/M,FLASH EPROM,1M X 8,RVS 3.0 3.2  F
 12     1      060695-001   U2       CONFIG GAL,16V8,EXP,CH SELCTRL 1.3 1.5 F
 13     5      578253-001   U3       IC,S/M,74ALS245,OCT BUS XCVR 0.5  2.3  F
               "            U4                                    1.1  2.3  F
               "            U5                                    1.8  2.3  F
               "            U6                                    2.5  2.3  F
               "            U7                                    3.2  2.2  F
 14     1      578254-001   U1       IC,S/M,LT1109,12V SPLY,120MA 2.7  0.8  F
 15     1      582281-008   J1       CONN,S/M,SKT,.8MMX6MM,80-POSN 1.9 1.7  F
 16     1      585701-027   L1       INDUCTOR,S/M,33UH,10%        2.4  0.6  F
```

# *3400B/3400C Memory Expansion Card Assembly (6M)*

```
PL# 060464-002      TITLE: PCB ASSY,MEM EXP,3400              PAGE 1/2
PL REV: D                                                     123199
RUN DATE: Nov 9 10:07:36
-------------------------------------------------------------------------
ITEM  QTY/UM   PART NO.   REFDES      DESCRIPTION             X    Y   F/B
-------------------------------------------------------------------------
 1    1        060463-002             PCB,MEM EXP,3400
 2 0.001 RL    046766                 LBL.STK..23HX1.50L,4-HI.4MIL.
 3    7        556629       R1        RES,S/M,FILM,.12W,5%,47 OHM   0.9  1.6  F
              "            R2                                   0.9  1.5  F
              "            R5                                   1.1  1.2  F
              "            R6                                   0.9  1.2  F
              "            R7                                   0.9  1.8  F
              "            R8                                   0.9  1.4  F
              "            R9                                   0.9  1.5  F
 4    1        556658       R3        RES,S/M,FILM,.12W,5%,1.0 KOHM  0.5  1.8  F
 5    1        563601       C31       CAP.S/M,TANT 10V MIN+-20%4.7UF 2.3  1.3  F
 6    2        563614       C25       CAP,S/M,TANT,33UF,16V,20%     2.7  0.6  F
              "            C30                                   2.8  1.0  F
 7   22        563700       C1        CAP,S/M,CER,50VMIN,20%,.1 UF  1.7  3.5  F
              "            C2                                    1.6  4.6  F
              "            C3                                    1.3  2.7  F
              "            C4                                    1.7  3.7  F
              "            C5                                    1.0  3.2  F
              "            C6                                    2.2  4.4  F
              "            C7                                    2.2  3.0  F
              "            C8                                    2.8  4.7  F
              "            C9                                    2.2  4.0  F
              "            C10                                   2.8  3.4  F
              "            C11                                   2.8  4.2  F
              "            C12                                   0.8  2.2  F
              "            C13                                   1.7  3.2  F
              "            C14                                   1.1  4.7  F
              "            C15                                   2.8  2.9  F
              "            C17                                   2.2  2.2  F
              "            C19                                   1.0  3.9  F
              "            C20                                   2.8  3.6  F
              "            C21                                   0.3  2.8  F
              "            C22                                   1.6  2.7  F
              "            C26                                   1.3  1.2  F
              "            C28                                   2.8  2.2  F
 8    6        563720       C16       CAP,S/M,CER,50VMIN,5%,150 PF  0.8  2.5  F
              "            C18                                   2.2  2.5  F
              "            C23                                   0.3  2.6  F
              "            C24                                   1.6  2.6  F
              "            C27                                   1.2  1.2  F
```

```
PL# 060464-002        TITLE: PCB ASSY,MEM EXP,3400          PAGE 2/2
PL REV: D                                                   123199
RUN DATE: Nov 9 10:07:36
-----------------------------------------------------------------------
ITEM  QTY/UM   PART NO.   REFDES    DESCRIPTION             X    Y   F/B
-----------------------------------------------------------------------
                  "         C29                            3.1  2.6   F
  9    1       564239-001   D1     DIODE,S/M,DUAL,6A,100V   2.4  0.9   F
 10    3       578166-001   U9     IC,S/M,FLASH EPROM,1M X 8,STD  3.0  4.2  F
                  "         U10                            2.5  3.2   F
                  "         U13                            2.0  4.2   F
 11    3       578166-002   U8     IC,S/M,FLASH EPROM,1M X 8,RVS  3.0  3.2  F
                  "         U11                            2.5  4.2   F
                  "         U12                            2.0  3.2   F
 12    1       060695-001   U2     CONFIG GAL,16V8,EXP,CH SELCTRL 1.3  1.5  F
 13    5       578253-001   U3     IC,S/M,74ALS245,OCT BUS XCVR   0.5  2.3  F
                  "         U4                             1.1  2.3   F
                  "         U5                             1.8  2.3   F
                  "         U6                             2.5  2.3   F
                  "         U7                             3.2  2.2   F
 14    1       578254-001   U1     IC,S/M,LT1109,12V SPLY,120MA   2.7  0.8  F
 15    1       582281-008   J1     CONN,S/M,SKT,.8MMX6MM,80-POSN  1.9  1.7  F
 16    1       585701-027   L1     INDUCTOR,S/M,33UH,10%    2.4  0.6   F
```

# *3400C Memory Expansion Card Assembly (8M)*

```
PL# 067396-001        TITLE: PCB ASSY,MEM EXP,8M,3400C      PAGE 1/1
PL REV: B                                                   05111998
RUN DATE: May 11 14:46:32
-----------------------------------------------------------------------
ITEM  QTY/UM   PART NO.   REFDES    DESCRIPTION             X    Y   F/B
-----------------------------------------------------------------------
  1    1       060464-002         PCB ASSY,MEM EXP,3400
  2  0.001 RL  046766            LBL.STK..23HX1.50L,4-HI.4MIL.
  3    1       578166-001   U14    IC,S/M,FLASH EPROM,1M X 8,STD   1.4  3.3  F
  4    1       578166-002   U15    IC,S/M,FLASH EPROM,1M X 8,RVS   1.4  4.2  F
```

# 8

# Replacement Parts

*This chapter contains both a complete list of the replacement parts and an illustration identifying each part.*

# Finding and Ordering Replacement Parts

To locate the part you want to replace, find the part in the illustration and locate the corresponding ID number in the spare parts list. Use the part number shown in the list when ordering parts.

To order replacement parts, contact Intermec:

Intermec Technologies Corporation
6001 36th Avenue West
P.O. Box 4280
Everett, WA  98203-9280

Instructions for replacing parts can be found in Chapter 6, "Repairing and Replacing."

*Note: Not all printer parts are available for purchase as replacement parts due to lack of necessity, or because the part can only be replaced at the factory.*

# 3400 Tools

| Part No. | Description | ID No. |
|----------|-------------|--------|
| T42374 | Printhead Alignment Tool | |
| T24389 | Roller Alignment Tool | |

# 3400 Manuals

| Part No. | Description | ID No. |
|----------|-------------|--------|
| 065145 | 3400, 3440, and 3600 Printers User's Manual | |
| 064678 | 3400, 3440, and 3600 Printers Getting Started Guide | |
| 060228 | 3400 Printer Maintenance Manual | |
| 059769 | 3400 Manual Safety Supplement | |
| 061536 | Kanji/Katakana Option Supplement | |

# 3400C Replacement Parts

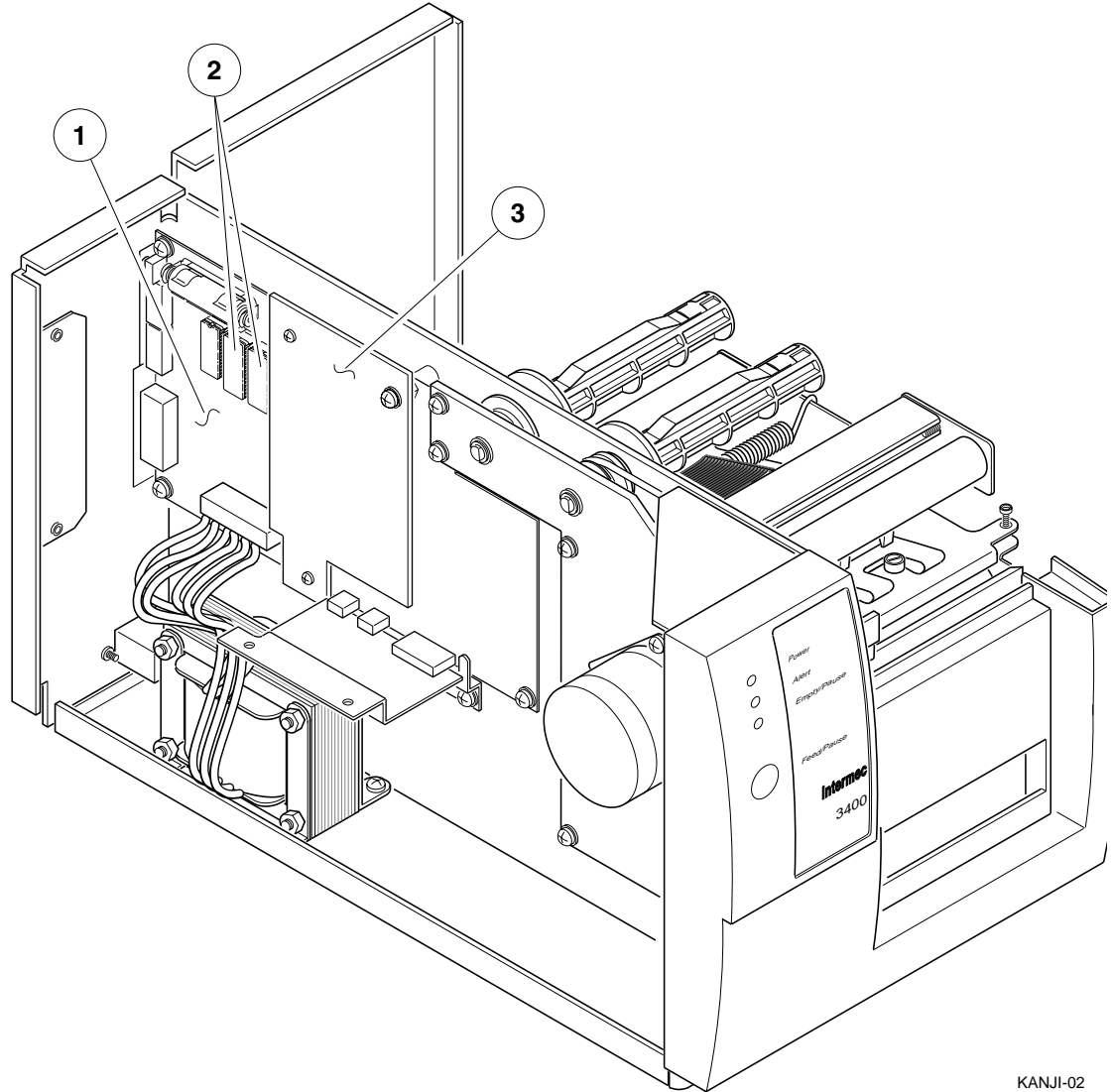| Part No. | Description | ID No. |
|---|---|---|
| 066070S-007 | PCB Assembly, 3400C Main | 1 |
| 066211S-002 | Firmware, 3400C, Standard | 2 |
| 061486S-001 | PCB Assembly, Memory Expansion, 3400 (2M) | 3 |
| 061485S-001 | PCB Assembly, Memory Expansion, 3400 (6M) | 3 |
| 067396S-001 | PCB Assembly, Memory Expansion, 3400 (8M) | 3 |

# 3400B Replacement Parts

| Part No. | Description | ID No. |
|---|---|---|
| 060538S-010 | PCB Assembly, 3400B Main | 1 |
| 060688S-008 | Firmware, 3400B, Standard | 2 |
| 061486S-001 | PCB Assembly, Memory Expansion, 3400 (2M) | 3 |
| 061485S-001 | PCB Assembly, Memory Expansion, 3400 (6M) | 3 |

# 3400A Replacement Parts

| Part No. | Description | ID No. |
|---|---|---|
| 059050S-013 | PCB Assembly, Main | 1 |
| 059877S-010 | Firmware, 5 Mil Printhead | 2 |

*Replacement Parts: PCB Assembly, Firmware, and Memory Expansion*



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# *3400A, 3400B, and 3400C Replacement Parts*

| Part No. | Description | ID No. |
|---|---|---|
| 059101-009 | Cover, Electronics | 1 |
| 059100-008 | Bezel, Top Cover | 2 |
| 059011-010 | Cover, Rear | 3 |
| 059710-001 | Magnet, Door Latch | 4 |
| 059009S-007 | Cover, Media Access | 5 |
| 059052S-002 | PCB Assembly, Bezel | 6 |
| 059012-009 | Plate, Front Cover | 7 |
| 059387-003 | Bracket, Hinge | 8 |
| 059010S-009 | Bezel, Front Cover | 9 |
| 060315-003 | Roller, Pinch | 10 |
| 060259-001 | Door Assembly, Access | 11 |
| 501272-001 | Feet, Rubber, Adhesive | 12 |
| 059103-002 | Button, Cap | 13 |
| 521118-001 | Washer, Sprint, Conl, .175 x .50 x .07 | 15 |
| 505613 | Screw, Soc HD Cap 8-32 | 16 |
| 059026-007 | Plate, Lower Module, Outboard | 17 |
| 059003S-001 | Printhead, 4.09 Inch 5 mil | 18 |
| 059654-003 | Heatsink Assembly, Leafspr & P/H | 19 |
| 059727-001 | Cable Assembly, Bezel | 20 |
| 059496-004 | Cable Assembly, Label Taken Sensor | 21 |
| 059729-003 | Cable Assembly, Label Mark Sensor | 22 |
| 059495-002 | Cable Assembly, Label Gap Sensor | 23 |
| 059024-009 | Plate, Motor | 24 |
| 060246-002 | Filter Assembly, Line AC, 3400 | 25 |
| 586229 | Battery, Lithium 3.6V, 1.75AH | 26 |
| 059022-006 | Bracket, Media Path, Upper | 29 |
| 059030-005 | Edge Guide, Outer | 30 |

## 3400A, 3400B, and 3400C Replacement Parts (continued)

| Part No. | Description | ID No. |
|---|---|---|
| 059023-006 | Bracket, Media Path, Lower | 31 |
| 059781-001 | Thumbscrew Assembly | 32 |
| 507717 | Fastener, Cotter Pin 25, .25 Shaft | 33 |
| 059122-001 | Lever, Printhead Adjustment | 34 |
| 059037-005 | Block, Pivot | 35 |
| 059040-007 | Spring, Torsion, Printhead | 36 |
| 506013 | Washer, SST, .255ID x .407 | 37 |
| 059032-002 | Bracket, Printhead Pivot | 38 |
| 059039-012 | Handle, Printhead Pressure | 39 |
| 501409 | Retaining Ring, .250 DIA Basic | 40 |
| 062476-004 | Plate, Upper Module, Outboard | 41 |
| 059510-001 | Roller, Liner Drive | 42 |
| 058997-005 | Roller, Drive | 43 |
| 058996-009 | Roller, Platen | 44 |
| 501401 | Retaining Ring, .250 DIA 8610 | 45 |
| 059423-002 | Mount, Mark Sensor | 46 |
| 057606 | Bar, Tear, 5.3 In. | 47 |
| 059117-005 | Post, Media | 48 |
| 059038-003 | Shaft, TTR Ribbon | 49 |
| 062614-001 | Cam Assembly, Pressure | 50 |
| 059718-002 | Ring, Label Supply | 51 |
| 059120-002 | Cap, Media Post | 52 |
| 059484-003 | Spring, Paper Path Return | 53 |
| 059509-002 | Shaft, Paper Path | 54 |
| 062396-002 | Mount, Label Gap Sensor | 55 |
| 506040-006 | Washer, Flat SST, .327 x .50 x .08 | 56 |
| 501413 | Retaining Ring, .312 DIA | 57 |
| 059021-002 | Cable Assembly, Main Motor Stepper | 58 |
| 059044-007 | Gear/Pulley, Cluster, L/H Lock | 59 |
| 501462-002 | O-ring, 2.950ID x .139THK | 60 |
| 059689S-008 | Clutch Assembly, Take-up | 61 |

### 3400A, 3400B, and 3400C Replacement Parts (continued)

| Part No. | Description | ID No. |
|---|---|---|
| 059511-005 | Gear/Pulley Cluster, RH Lock | 63 |
| 059114S-007 | Clutch Assembly, TTR Encoder | 64 |
| 506040-004 | Washer, Flat SST, .817 x 1.0 x .03 | 65 |
| 506040-003 | Washer, Flat SST, .447 x .88 x .03 | 66 |
| 501461-001 | Retaining Ring, External, .395 | 67 |
| 506040-005 | Washer, Flat SST, .327 x .50 x .03 | 68 |
| 059124-003 | Clamp, Liner Hub | 69 |
| 061513-003 | Hub, Ribbon Drive | 70 |
| 059125-005 | Bracket, Core Locking | 71 |
| 059028-007 | Gear, Platen, D Shaft, 96 Tooth | 72 |
| 522690 | Screw, Thread Roll with Cone, 8 x 32 .38 | |
| 526036 | Screw, Phillips, with Int. Star, 6 32 x .375 | |
| 586105 | Cord, AC Power, 3-Cond, 8 ft | |
| 586266 | Cord, AC Power, England, 240V | |
| 586267 | Cord, AS Power, European, 220V | |
| 059016-001 | Transformer Assembly, 115V | |
| 059816-001 | Transformer Assembly, 230V (Pwr Pkg UK) | |
| 580213 | Connector, 2-Position Shorting, .10CTRS. | |
| 580285 | Connector, Hdr. 8-Position, .156, Friction | |
| 580359 | Connector, Hdr. 4-Position Straight Thru | |
| 580096 | Connector, Receptacle, AC Power | |
| 048524 | Core, Ribbon 8646, Cardboard | |
| 059042-005 | Bearing, Blind Flanged | |
| 061811-002 | Bushing, Bronze, .316 ID, .475 OD | |
| 060316-001 | Shaft, Pinch Roller | |
| 501445 | Ring, Retaining .125 Diameter E-ring, Zinc | |
| 501273-002 | Circuit Breaker, Switch, 1 Amp | |

# 3400 Printer Options

| Part No. | Description | ID No. |
|----------|-------------|--------|
| 052713S-002 | PCB Assembly, Parallel Interface | |
| 057026S-003 | PCB Assembly, Coax I/O | |
| 057029S-004 | PCB Assembly, Twinax I/O | |
| 501367-001 | Guide, PCB Card Edge, 3 Inch | |
| 573053 | IC Type 32K x 8 CMOS SRAM | |
| 572088 | IC Type 128K x 8, Low Power, SRAM | |
| 048724 | Guide, Batch | |
| 060433-002 | Ejector, Batch Take-up | |

# 3400C Printer Options

| Part No. | Description | ID No. |
|----------|-------------|--------|
| 062756S-001 | Memory Expansion, 512K, 3400C | |
| 067182-001 | Kit, Cutter Assembly, 3400C | |
| 066833S-001 | Cutter Assembly | |
| 065591-001 | Cover Assembly, Cutter | |
| 066195-001 | Cable Assembly, Cutter | |
| 066181S-004 | PCB Assembly, Main, Cutter | |