ISI MODEL 487

operator's guide

Table of Contents

HOW TO USE THIS MANUAL

This manual is designed to guide you through all the procedures you'll need to install and operate the ISI Model 487 printer. If you are setting up your printer for the first time, be sure to read the sections in sequence. Once you are familiar with the operations of the ISI 487 printer, it is recommended that you review the Pre-Print Checklist in Chapter 4 before printing any job, just to be sure that your printer is properly setup.

Here is a brief description of the information found in each chapter:

Chapter 1   PRE-INSTALLATION CHECK
                   Read this chapter when you first receive your printer. It
                   tells you how to spot signs of damage that may have occurred
                   during shipping. It also tells you how to make sure your
                   facilities are properly equipped for the printer.

Chapter 2   PRINTER FEATURES OVERVIEW
                   Tells you what controller model numbers are compatible with
                   the ISI 487 printer. Introduces you to the standard and
                   special features available with the ISI 487 and gives a
                   general description of some of the feature highlights.

Chapter 3   GUIDED TOUR OF PRINTER PARTS
                   Helps you quickly become familiar with the names and locations
                   of the parts of your printer before you begin the installation
                   procedures.

Chapter 4   GETTING READY TO PRINT
                   Includes a handy checklist you can refer to before printing a
                   job to make sure your printer is properly set up.

                   The chapters of this manual that describe the necessary set up
                   procedures are:

Chapter 5   HOW TO LOAD AND CHANGE THE RIBBON
                   Illustrates the proper way to insert and remove the ribbon
                   cassette and tells you what kind of ribbon to use.

Chapter 6   POWER-ON SEQUENCE AND TEST
                   Describes how to turn the printer on and what happens when you
                   do. Explains the automatic Self-Test and how to determine if
                   it ran successfully.

Chapter 7   CONNECTING THE ISI 487 TO A CONTROLLER
                   Explains how to attach the coaxial cable to the printer.
                   Includes a diagram showing the various controller models that
                   may be attached to the other end of the cable.

Chapter 8   HOW TO LOAD THE PAPER
                   Provides step-by-step procedures for loading the paper. Also
                   gives directions on how to install the paper guide racks.

Once you have performed the initial set up procedures, you will mainly be
concerned about the printing functions you can control and what to do if you
have a problem with your printer. You will find this information in the
following chapters:

Chapter 9   HOW TO OPERATE THE PRINTER
                   Explains each switch and light on the operator control panel,
                   its purpose and how to use it. Lists the user-selectable
                   options and how to select them. Includes explanations for
                   the audible alarm and the status indicator.

Chapter 10   WHAT TO DO IF YOU HAVE A PRINTER PROBLEM
                   Lists the possible operational status codes that may be dis-
                   played on the Status Indicator when your attention is re-
                   quired. The meaning of each code is explained and in-
                   structions are given for problems that an operator can easily
                   resolve. If you need help from qualified service personnel
                   at Interface Systems, Inc., the phone number is listed in
                   this chapter.

The following Appendixes contain information that you normally will not have to
refer to very often.

Appendix A   PREVENTIVE MAINTENANCE PROCEDURES FOR THE ISI 487
                   Gives instructions on how to perform some simple periodic
                   procedures that will help keep your ISI 487 printer in good
                   working order.

Appendix B   PROGRAMMING THE ISI 487 FOR SPECIAL PRINTING FUNCTIONS
                   Gives instructions on how to program your ISI 487 (through
                   escape sequences in the data stream) to perform standard and
                   optional printing functions.

Appendix C   PAPER SPECIFICATIONS
                   Lists detailed specifications you should refer to when
                   selecting paper or forms for your particular printing job.

Chapter 1

PRE-INSTALLATION CHECK

1.1 CHECK THE PRINTER FOR SHIPPING DAMAGE

Inspect the printer for signs of shipping damage. Look for dents, scratches, cracks, broken switches, or other broken parts. Listen for rattles as you move the printer around. Notify the delivery company immediately if you find any signs of damage.

CAUTION

Any attempt to operate a damaged printer may cause further damage and can void the warranty.

1.2 FOLLOW THE UNPACKING INSTRUCTIONS CAREFULLY

The "Unpacking Instructions" attached to your ISI 487 must be followed carefully to ensure proper performance of the printer. Perform all of the steps in the order they are listed, being sure to:

1. Remove the metal carriage restraint (see Figure 1-1).

2. Remove the red rubber print head restraint (see Figure 1-1).

1.3 CHECK YOUR FACILITIES

Make sure that the location you have chosen for installing your printer has all of the following equipment available:

1. One standard three-prong grounded power outlet per printer.

2. One type RG 62A/U single coaxial cable with type BNC UG260 B/U coaxial connector. Make sure the coaxial cable from the controller to the printer does not exceed 1500 meters (4920 feet)

3. A table or optional print stand for each printer. Make sure the location for the table or stand allows enough room for ventilation, hookup of the coaxial cable, paper handling, user work area, and room for any other equipment you plan to use with the printer.

4. Forms that comply with the specifications outlined in Appendix C.
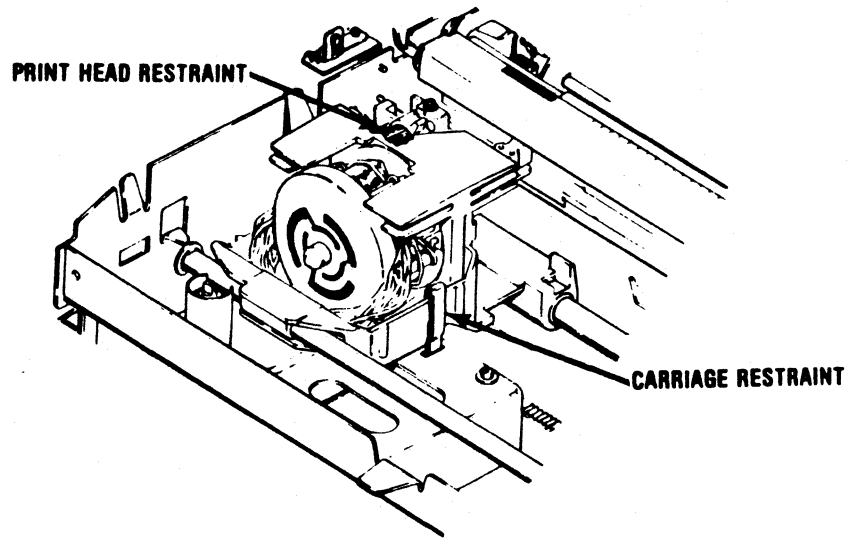
Figure 1-1 Print Head and Carriage Restraint Removal

is it obvious how to remove the restraints?

- 5 -

Chapter 2

PRINTER FEATURES OVERVIEW

The ISI 487 printer is a compact desk-top printer that is functionally interchangeable with the IBM 3287 and is compatible with the 3270 family. It can be connected via coaxial "Type A" interface to any of the following control units:

- IBM 3274 Controller

- IBM 3276 Controller

- IBM 4341 Processor

- IBM 4331 Processor

- Memorex 2076 or 2074

- Telex 274

- MDS/Trivex 8074

Figure 2-1 shows the possible ways to attach the ISI 487 printer to a system.

2.1 STANDARD FEATURES

Congratulations on your choice of the ISI 487 printer! The standard features listed below help explain why the ISI 487 is so cost-effective, versatile, and efficient to use. Following this list is a description of other standard features that allow the operator to control the printing process and to set and change various format parameters.

- 200 CPS dot matrix printing at 10 CPI and 50 CPS near letter quality printing at 10 CPI

- Continuous forms handling and single cut "letterhead" sheets handling

- Demand document feature allows printing within 1" top of form

DIRECT

REMOTE

LOCAL

4331 | I C A

IBM CPU 4331 | A D A P T E R

IBM CPU 4341

IBM CPU 360 370 303X 4300

TRANSMISSION CONTROL UNIT

IBM 270X 370X

FRONT—END PROCESSOR

TELEPHONE LINES

IBM 3274 C
(Supports up to 32 devices)

IBM 3276

COAX INTERFACE — CAT A
5,000 FT. MAX.

ISI MODEL 487 PRINTER

IBM CPU 370 303X 4300

BUS (DATA)

TAG (CONTROL SIGNALS)

IBM 3274 CONTROLLER TYPE A,

(Supports up to 32 display stations and/or printers)

Figure 2-1   Configurations

setup

- Operator-programmable memory

- Attractive, table-top design

- Outstandingly quiet operation

- 6 parts forms handling capability

- IBM 3287 international character set

- Extended print buffer for local copy support of IBM 3278 Models 3-5

- Status Indicator displays 3-digit, easy to remember codes for monitoring current format settings, error codes and selected test numbers.

- 16.67 CPI compressed print

- Operational in SCS or non-SCS mode. SCS mode is indicated by the READY light flashing while the printer is in the Hold Print mode.

2.2 USER-SELECTABLE FEATURES

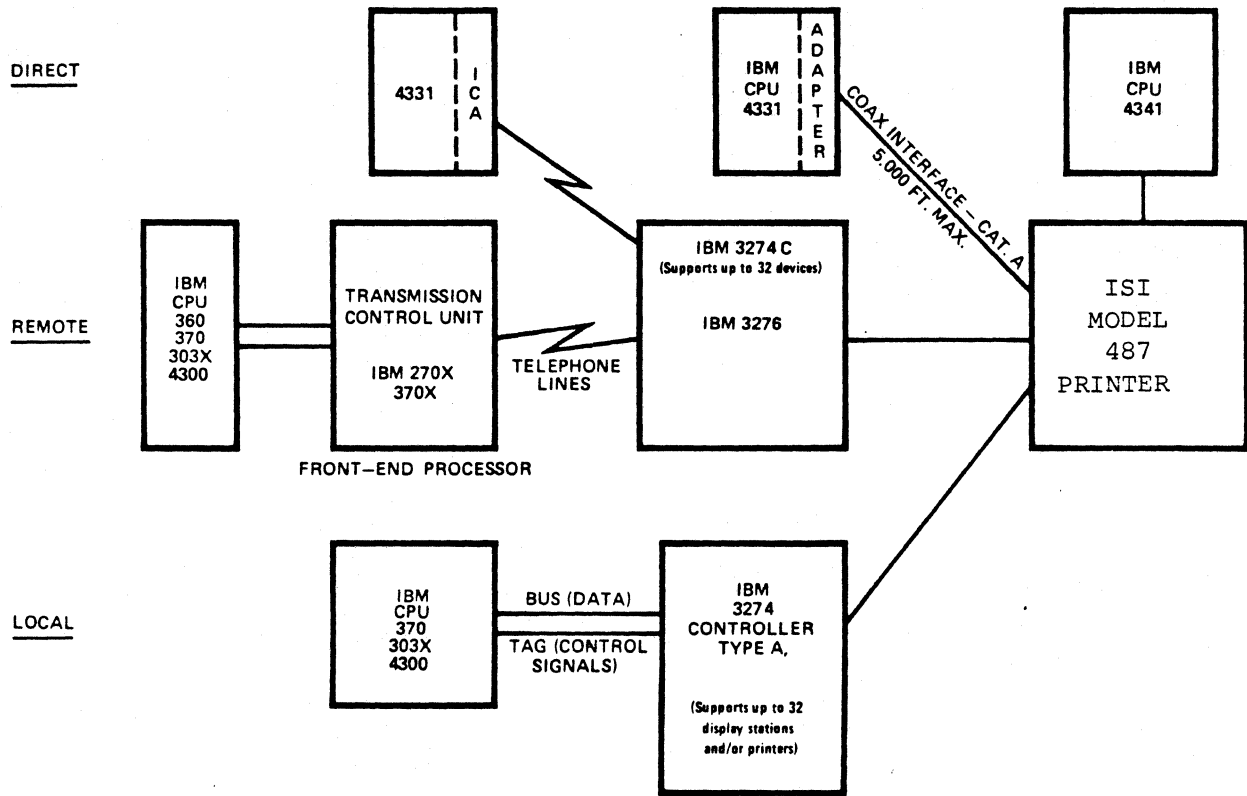The operator control panel on the front of the printer consists of switches, lights and a status indicator that allow you to control and monitor the printing process and set various format parameters. Two switch packs are located inside the window on the rear of the printer housing. The settings of these switches afford the operator an even greater selection of special printing options. To give you an idea of the many printer functions you can control, this chapter lists and briefly describes these functions.

Detailed explanations of how to use all of the control features described below are detailed in Chapter 9.

initial

FORMS LENGTH   Upon power-up, the default setting is 66 lines per
                                page, which is standard for 8-1/2 by 11 inch paper at
                                6 lines per vertical inch. You can select a 3-digit
                                page length of 001 to 999 lines. Refer to the SET FL
                                switch description in Section 9.5.1 for detailed
                                instructions.

initial

MAXIMUM PRESENTATION
POSITION (LINE LENGTH)   The line length default setting at power up is 132
                                character positions (including spaces) for 10 CPI.
                                You can select a line length of 001 to 132 (or 220 for
                                16.67 compressed print). Refer to the SET MPP switch

description in Section 9.5.2 for detailed instructions.

LINES PER INCH   You can select 6 or 8 as the number of lines to be printed per inch. And, because you can also select single or double spacing, you can vary the number of lines per inch to be 3 (select 6 lines per inch, double-spaced), or 4 lines per inch (select 8 lines per inch, double-spaced). The printer is automatically set at 6 lines per inch, single-spaced. Refer to the CHG LPI and CHG SPACE switch descriptions in Sections 9.4.12 and 9.4.13 for detailed instructions.

FORM FEED AND INDEX   While the printer is in the Hold Print mode, you can advance the paper to the next top-of-form, depending on the page length setting, by using the FF (Form Feed) switch. You can also advance the form by one line, using the INDEX switch. Both of these switches are described in Sections 9.4.3 and 9.4.4.

STOP/START PRINTING   You can stop printing in process with the HOLD switch and then restart printing with the ENABLE switch. These switches are described in Sections 9.4.1 and 9.4.2.

FORMS ALIGNMENT   While the printer is in operation, you can move the paper up or down using the ⬆ or ⬇ switches. This feature allows you to easily align preprinted forms, as described in Sections 9.4.5 and 9.4.6

PRINTING SPEED AND MODE You can determine the print quality of the ISI 487 with the CHG SPEED switch. With a touch of the switch the ISI 487 will deliver 200 CPS dot matrix printing or 50 CPS near letter quality printing. You can also select the type of forms the ISI 487 can handle with the CHG MODE switch. By pressing the switch, the ISI 487 will be ready to handle either single cut sheets or continuous forms. Both of these switches are discussed in detail in Sections 9.4.15 and 9.4.16.

LANGUAGE SELECT   From a variety of international character sets, you can select the language set your ISI 487 will print in. switch pack E60, located in the rear of the printer housing makes this selection possible. Refer to Section 9.7.1 for detailed instructions.

IBM MODEL SELECT   Switch pack E60 also makes possible the selection of various IBM Model numbers (buffer sizes), for copy support by the ISI 487. See Section 9.7.2 for more information.

COPY FORM FEED

You can set the printer to perform a form feed after an operator initiated copy. Refer to Section 9.7.3

NULL LINE PRINT

You can select Null Line Print to print lines consisting entirely of null characters. Refer to Section 9.7.3 for more information.

16.67 CPI
COMPRESSED PRINT

You can select 16.67 characters per inch printing. Refer to Section 9.7.3 for more information.

Chapter 3

INTRODUCTION TO THE PRINTER PARTS

Before you begin the installation procedures, this introduction will help
you become familiar with the names and locations of the various parts and
controls of the ISI 487 printer.

Notice that the pictures in this introduction show the paper and ribbon
cassette already installed. You will learn how to load the paper and
install the ribbon cassette in later sections.

Start the introduction with the front of the printer facing you. Use
Figure 3-1 to locate the following parts on your printer:

1. Forms Lever

2. Print Head Adjustment Lever

3. Power On/Off Switch

4. Control Panel

5. Top Cover

6. Acrylic Cover
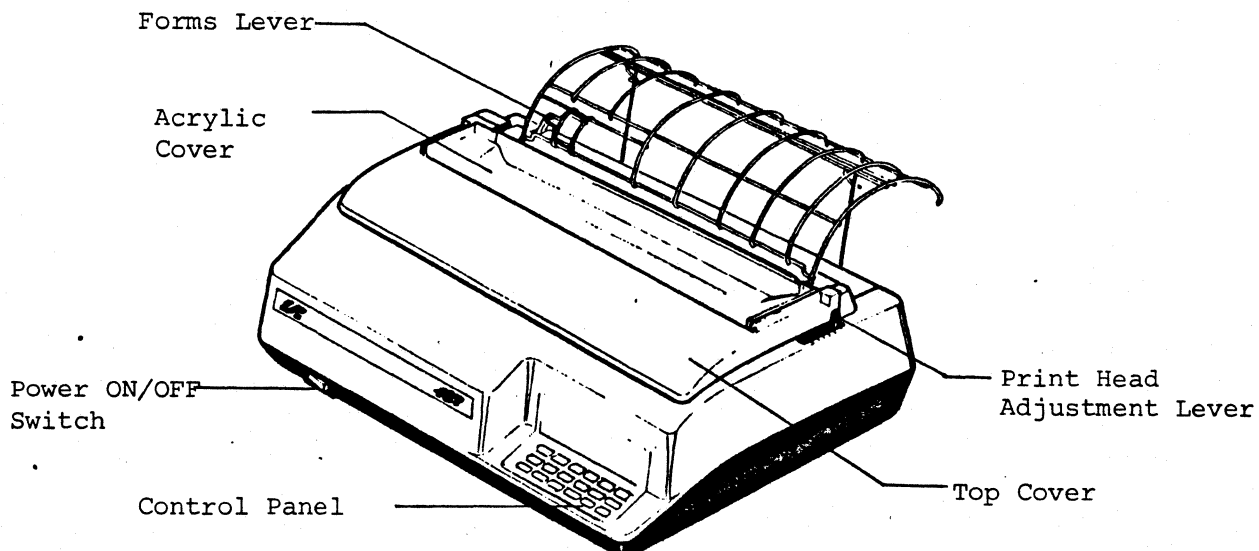
Figure 3-1

Remove the top cover (flip the acrylic cover up and over, grasp the top cover from the inside and gently pull straight up and off) and use Figure 3-2 to locate the following parts on your printer:

1. Print Head Assembly

2. Silver Column Scale/Tear Bar

3. Ribbon Cassette
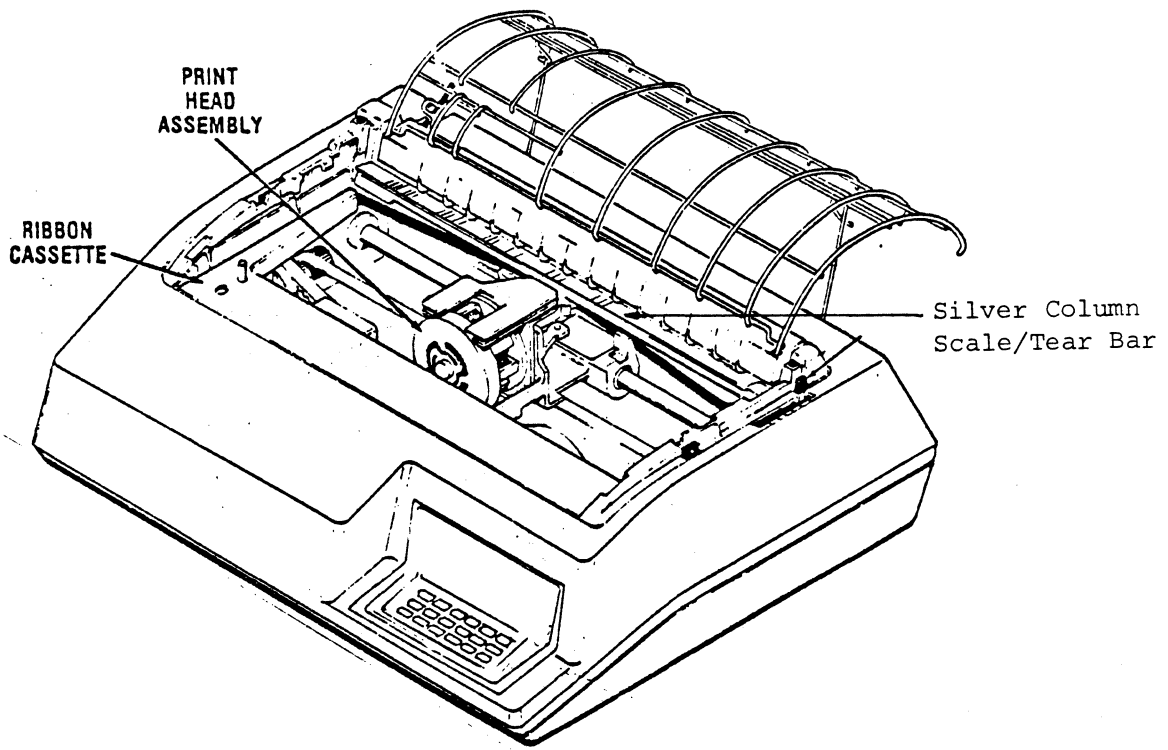
Figure 3-2

Examine the rear panel of your printer and use Figure 3-3 to locate:

1. **Coaxial Cable Connector**

2. **Power Cord** Connector

3. **Option Switches E60 and E81**

4. CU Light

5. Rear Cover

Rear Cover

Power Cord Connector

Coaxial Cable Connector

E60 and E81 Option Switch Packs

CU Light
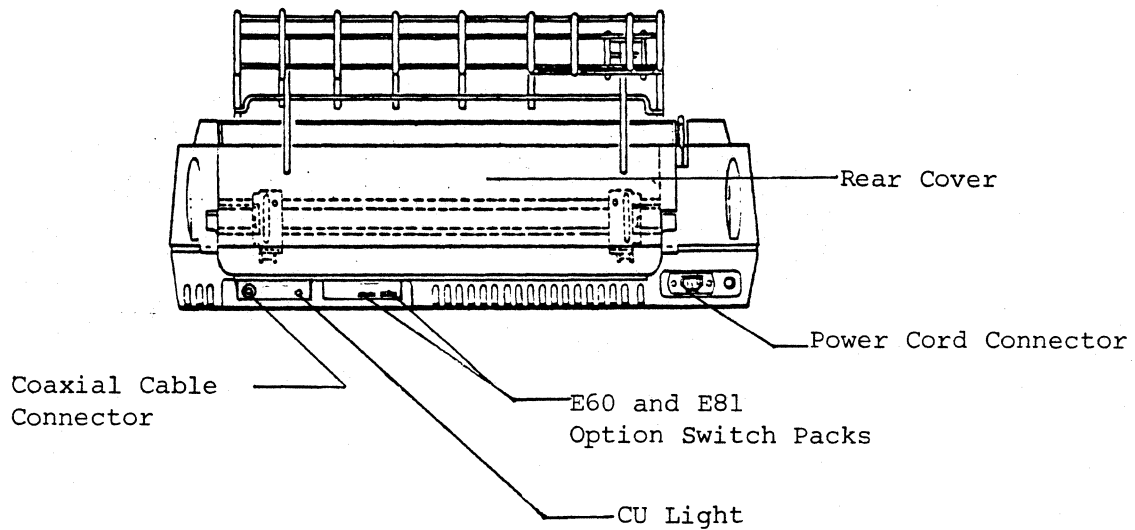
Figure 3-3

Open the Rear Cover by carefully pulling it down and use Figure 3-4 to locate the following parts:

1. Pin Feed Tractors

2. Tractor Locking Levers

3. Paper Guides

4. Platen

Once you have located all of the parts listed, close the rear cover and replace the top cover.
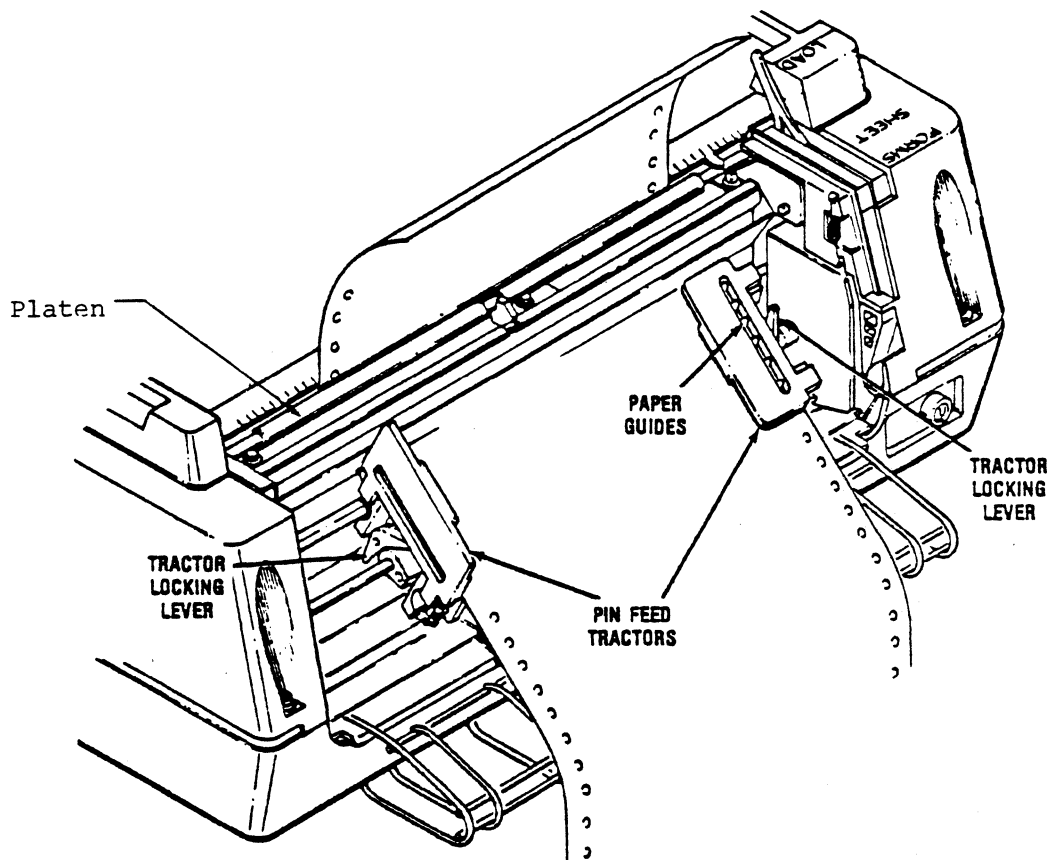
Figure 3-4

Chapter 4

GETTING READY TO PRINT

This chapter lists the procedures you must perform to get your printer ready to print. The Pre-Print Checklist is a list of questions you should ask yourself before you print any job. If you answer NO to any one of the questions, go to the section of this manual that describes the procedure you need to perform and follow it step-by-step.

4.1 PRE-PRINT CHECKLIST

1. Is the printer power cord plugged securely into a well grounded power outlet?

2. Is a good ribbon cassette installed?

3. Is the paper or continuous form loaded properly for the job you are going to print?

4. Do you have enough paper for the job you are going to print?

5. Is the POWER ON/OFF switch in the ON position?

6. Is the coaxial cable securely connected to the printer?

7. Are the READY and CU SIGNAL lights on?

Chapter 5

HOW TO LOAD AND CHANGE THE RIBBON

The ISI 487 uses a convenient long-life ribbon cassette. Do not attempt to use any other ribbon cassette in your printer except those supplied by Interface Systems, Inc. Though other manufacturers offer "similar" ribbons, they are not recommended and may cause serious problems. To order ribbon cassettes from Interface Systems, Inc. please refer to the following part number: #64002021-5001.

5.1 LOADING THE RIBBON

The ribbon cassette and paper guide racks were not installed before shipping. This section describes how to load the ribbon cassette; Section 8.1, explains how to install the paper guide racks.

To install the ribbon cassette, refer to Figure 5-1 and perform the following steps:

1. Lift the top cover up and off the ISI 487.

2. Unsnap the top portion of the rear cover and allow it to hang open.

3. Locate the print head and make sure it is at the extreme left margin.

CAUTION

Whenever you insert or remove the ribbon cassette or touch the print head, make sure the printer cannot print during this time. If printing is going on when you need to change the ribbon, press the HOLD switch to interrupt printing.

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4. Place the forms lever in the "LOAD" position.

5. Lift the silver column scale into the up position.

6. Move the head adjustment lever towards the front of the printer to
    its maximum position.

7. Snap the two left and two right retaining tabs of the new ribbon
    cassette into the four slots on the left and right side frames.

8. Install the new ribbon guide by squeezing together the two tabs at
    the top of the guide and pushing the guide downward onto the front of
    the print head.

9. Pull the cardboard ribbon tag off the top of the ribbon cassette.

10. Rotate the ribbon drive gear knob counter-clockwise several turns to
    ensure the ribbon is feeding properly.

11. Place the column scale in the down position and move the forms lever
    to the type of forms ("SHEET" or "FORMS") you will be printing on.
    Make sure the print head adjustment lever is in the same position it
    occupied before you began the ribbon cassette installation.

12. Lift and snap the rear cover closed.

13. Insert the front lip of the top cover under the body cover and close
    the top cover.

5.2 CHANGING THE RIBBON

If your printer is printing at the time you need to change the ribbon,
press the HOLD switch on the operator panel to interrupt the printing. If
printing is not in progress, turn the POWER ON/OFF switch to OFF.

To remove the ribbon cassette, refer to Figure 5-1, and follow the
procedure outlined below:

1. Repeat steps 1-6 described in Section 5.1.

2. Remove the ribbon guide from the front of the print head by squeezing
    together the two tabs at the top of the ribbon guide and lifting
    upward.

3. Lift the used ribbon cassette and attached ribbon guide up and out of
    the printer.

4. Repeat steps 7-13 described in Section 5.1.

5. Press the ENABLE switch to allow printing to resume.
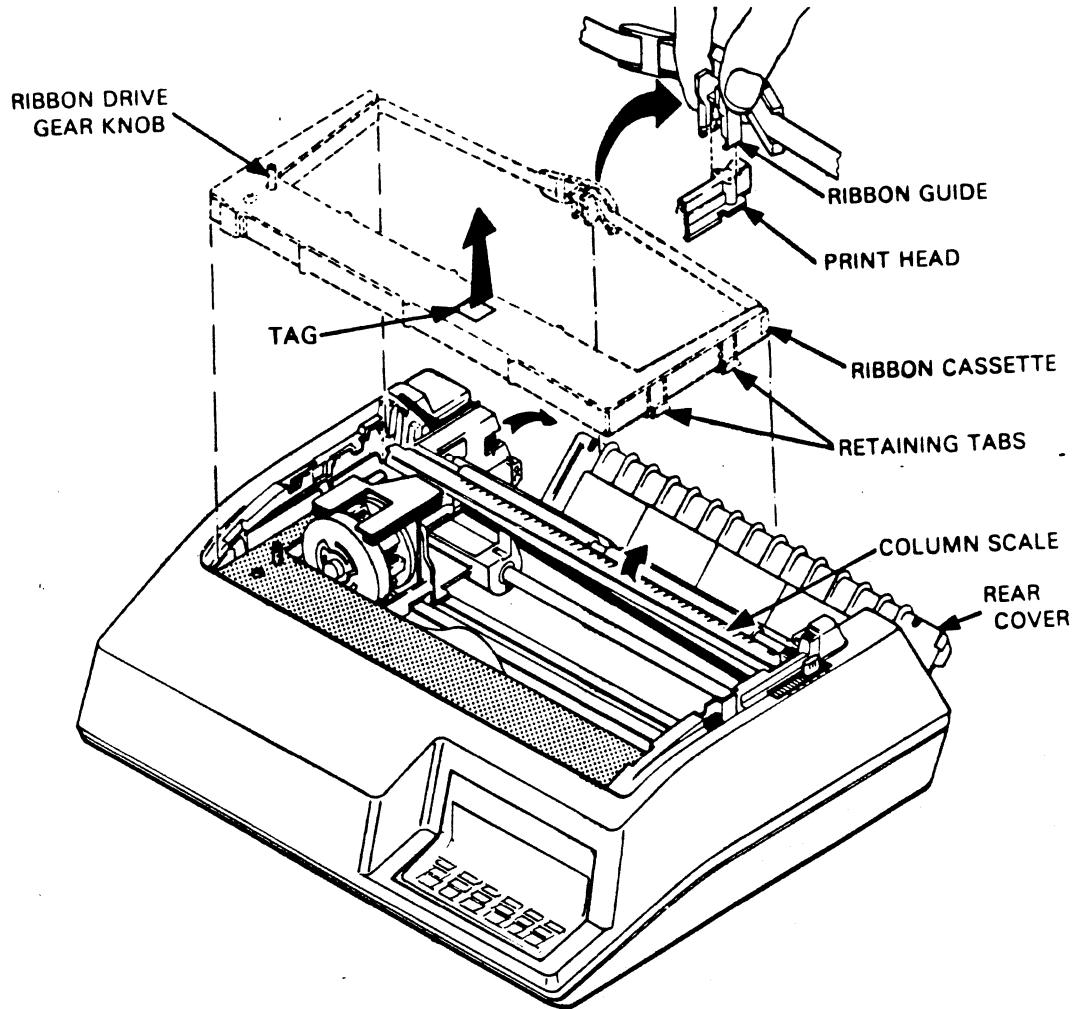
Figure 5-1

Chapter 6

POWER-ON SEQUENCE AND SELF-TEST

After you have carefully performed all the procedures preceding this Chapter, your printer is ready to be powered on.

1. Make sure the Forms Lever is in the "FORMS" or "SHEET" position.

2. Plug the power cord into the power cord connector on the back of the ISI 487, and into the power outlet.

3. Set the POWER ON/OFF switch to ON.

After you have powered the printer ON the following sequence of events will occur:

1. The Status Indicator will initially read "000."

2. The Status Indicator will then read "888," all of the lights on the operator control panel will come on and then go off.

3. The printer performs a Self-Test of its basic functions. During this test, the print head moves from left to right and back. The alarm will sound and the Status Indicator will display a "1" to indicate a paper out condition. Press the HOLD switch to silence the alarm.

If the ISI 487 performs the preceding sequence of events successfully, you are ready to move on to the instructions in Chapter 7. If the ISI 487 fails the power-on sequence, contact your service representative immediately.

Chapter 7

CONNECTING THE ISI 487 TO A CONTROLLER

The ISI 487 is only one part of your computer system. In order for your printer to receive data to print, it must be connected to a controller (control unit). The connection is made by attaching a coaxial cable from the control unit to the printer.

Your ISI 487 can be attached to any of the following equipment:

- IBM 3274 Controller

- IBM 3276 Controller

- IBM 4341 Processor

- IBM 4331 Processor

- Memorex 2076 or 2074

- Telex 274

- MDS/Trivex 8074

No matter which device you have, the procedure for connecting the coaxial cable is the same. Follow these steps:

1. Turn the POWER ON/OFF switch to OFF.

2. Bring the coaxial cable to your printer.

3. Locate the coaxial connector on the back of the printer as shown in Figure 8-1.

4. Push and lock (twisting clockwise) the cable connector into the printer connector as shown in Figure 7-1.

You are now ready to load your ISI 487 with paper. Proceed to Chapter 8 for loading instructions.
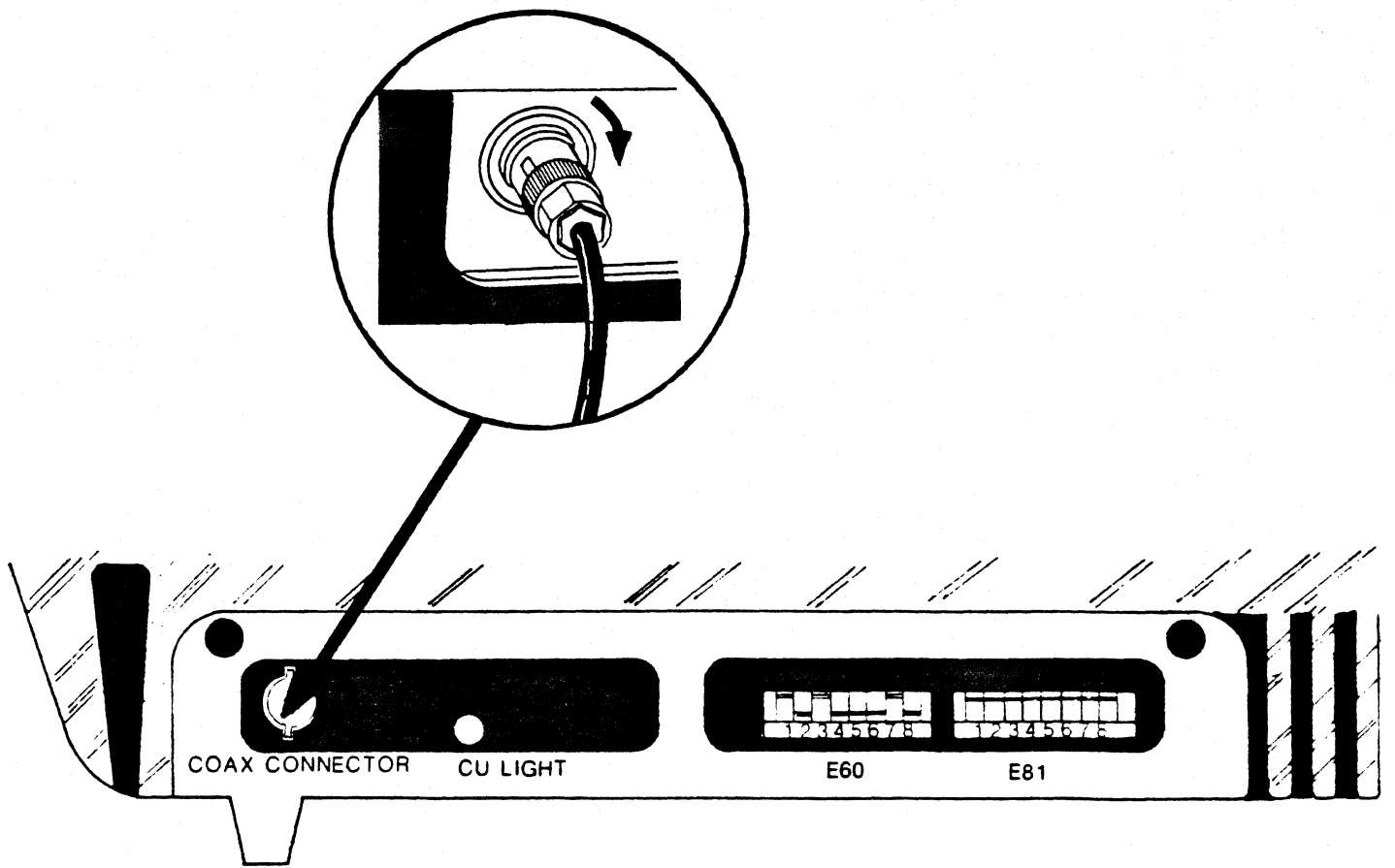
Figure 7-1 Connecting the Coaxial Cable

Chapter 8

HOW TO LOAD THE PAPER

8.1 FIRST, INSTALL THE PAPER GUIDE RACKS

Refer to Figure 8-1 and follow the procedure outlined below to install the Paper Rack Inlet and the Paper Rack Outlet.

1. Holding the paper rack inlet and facing the rear of the printer, install the prongs on both sides of the rack into the two mounting holes on the left and right frames (located inside the printer housing, beneath the rear cover).

2. Make sure the paper rack inlet is at a 90 degree angle with the rear cover and does not tilt upward.

3. Pick up the paper rack outlet and remove the two nylon thumbnuts from the two mounting arms. Retain the thumbnuts.

4. Facing the rear of the printer, install the two end mounting tabs on the paper rack outlet into the two mounting holes on top of the rear cover.

5. Install the two threaded mounting arms of the paper rack outlet into the mounting holes in the middle of the rear cover.

6. Carefully open the rear cover and install the two nylon thumbnuts onto the threaded portion of the mounting arms.

7. Close the rear cover.

8.2 SELECTING THE RIGHT PAPER

The ISI 487 can handle continuous forms fanfold paper or single cut sheets. For detailed paper specifications and recommendations for attaining best print quality and forms handling, see Appendix C.

1

REAR COVER

TOP COVER

3

BODY COVER MOUNTING HARDWARE

LEVER CAP

BODY COVER

2

REF. PRINTER MECHANISM

THUMBSCREW
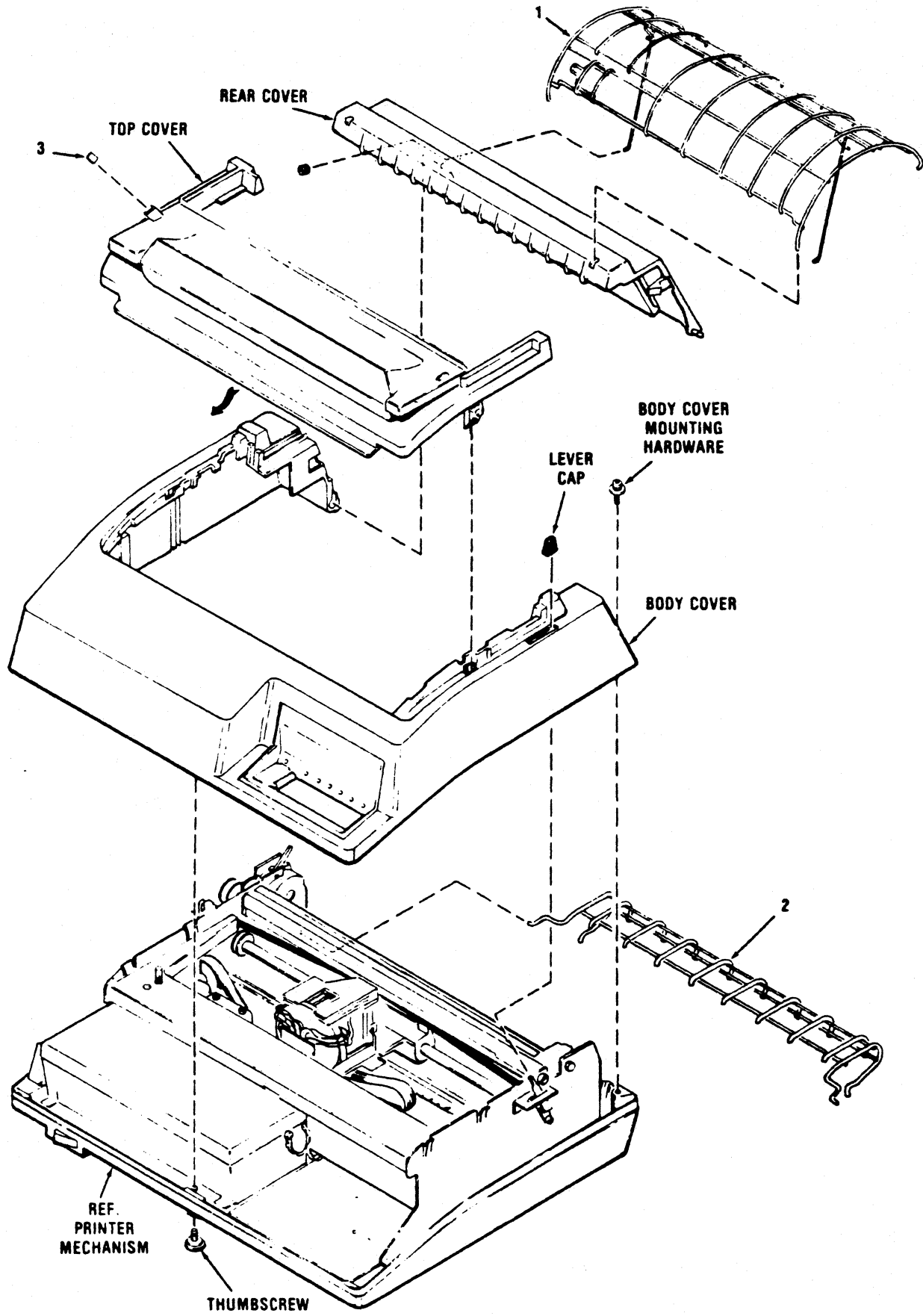
Figure 8-1   Installing the Paper Guide Racks

8.3 INITIAL LOADING OF FANFOLD FORMS

This section outlines the procedure for initial loading of either single part or multi-part fanfold forms. Locate each paper handling control illustrated in Figure 8-2 and perform the following steps:

1. Set the POWER ON/OFF switch to OFF and plug the printer into the power source.

2. Unsnap and lift the rear cover from the printer.

3. Locate the left and right pin feed tractors. Open the left and right tractor paper guides.

4. Place the forms to be installed on the pin feed tractors, being sure to align the paper evenly betweeen the two tractors and covering all pins.

5. Make sure the tractors are adjusted to accommodate the forms. To adjust them, loosen the left and right pin feed locking levers (by lifting the lever up) and slide the tractors into place. Once in proper position, tighten the locking levers.

6. Replace and close the rear cover.

7. Place the forms lever in the "FORMS" position.

8. Make sure the top acrylic cover is closed.

9. Set the POWER ON/OFF switch to ON. The printhead will move to the first print position.

10. After the READY indicator is lit, move the forms lever to the "LOAD" position.

11. Press the HOLD switch to prevent the printing process from starting.

12. Depress the ↑ switch for a few seconds to load paper up into the printer.

13. Use the ↑ switch and ↓ switch to adjust for top of forms alignment.

14. Move the forms lever back to the "FORMS" position.

15. Press the ENABLE switch. Your ISI 487 is now ready to print.
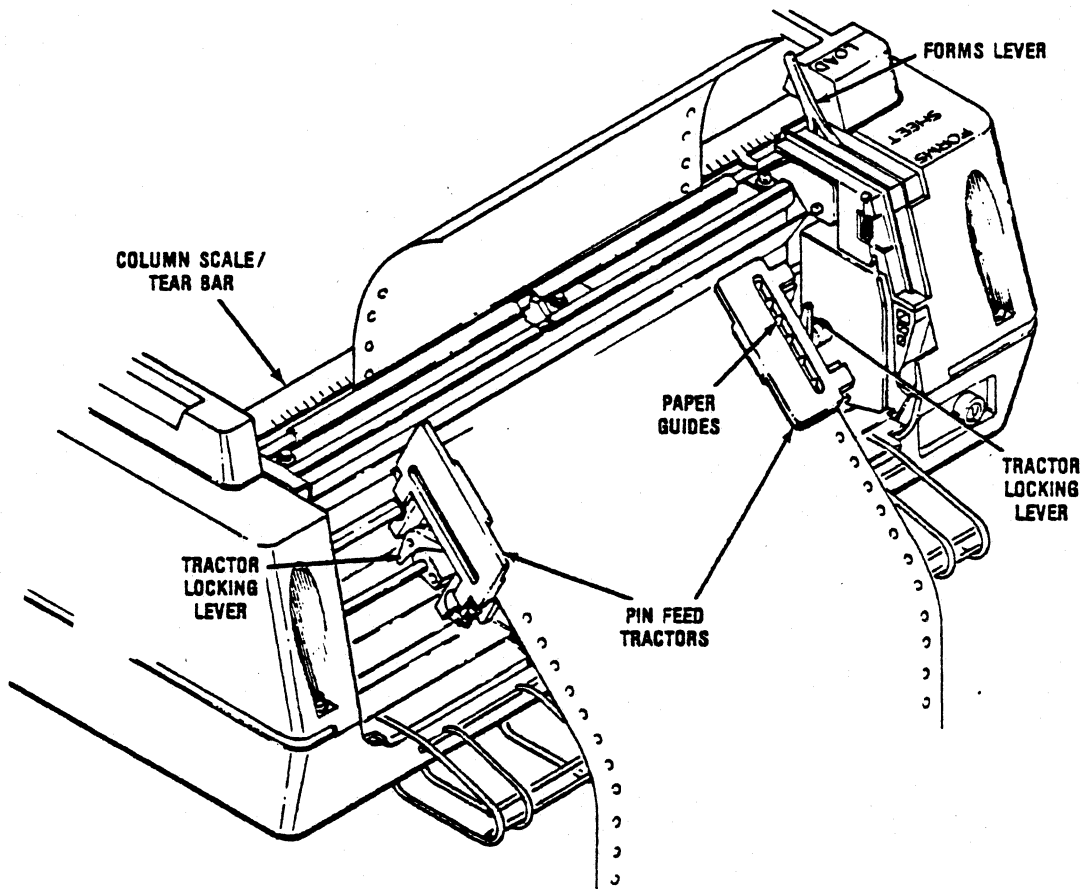
Figure 8-2   Loading Fanfold Forms

8.4 RELOADING FANFOLD FORMS

The ISI 487 prints until the last fanfold forms passes through the paper empty switch on the left pin feed tractor. When the printer is out of paper these signals occur:

1. Printing stops.

2. The CHECK indicator lights.

3. The audible alarm sounds.

4. The status indicator displays a "1."

To reload fanfold forms, perform the following steps:

1. Place the printer into the hold condition by pressing the HOLD switch.

CAUTION

Whenever the printer runs out of paper while printing a job, press the HOLD switch to interrupt printing and ensure that the printer does not suddenly start printing while you're loading paper.

---

2. Move the forms lever to the "LOAD" position.

NOTE

Before performing step 3, note the position of the head adjustment lever. If installing the same form as previously used, you must return the lever to this position once the form is installed.

---

3. Pull the head adjustment lever toward the front of the printer to its maximum position.

4. Unsnap and lift the rear cover from the printer.

5. Open the left and right tractor guides and load the forms onto the pins.

6. Close the tractor guides.

7. Replace and close the rear cover.

8. Depress the ↑ switch for a few seconds to load paper up into the printer.

9. Use the ↑ switch and ↓ switch to adjust for top of forms alignment.

10. Place the forms lever in the "FORMS" position.

11. At this time, return the print head adjustment lever to its original position. If a different forms thickness is installed perform the print head impression adjustment as described in Section 10.3.

12. Press the ENABLE switch to resume printing.

8.5 INITIAL CUT SHEET INSERTION

The following procedure describes the initial insertion of cut sheets into an ISI 487 printer that is in fanfold forms mode and out of paper when powered on. Refer to Figure 8-3 and perform the following steps:

1. Press the HOLD switch to interrupt the printing process.

2. To enter the cut sheet mode of paper handling, press the CHG MODE switch on the operator panel. The CUT SHEET indicator will light.

3. If you would like to set the printer permanently in the cut sheet mode (the mode selected upon power up), first press the 2ND FUNC (this places the printer in 2ND FUNC mode)switch and then press the CONFIG switch (this stores the CUT SHEET mode permanently in the printer's memory).

4. While in 2ND FUNC mode, you may wish to adjust forms length or maximum presentation position. When the ISI 487 is in cut sheet mode it begins printing 1" from the top of the sheet and stops 1/2" from the bottom of the sheet. Adjust your parameters accordingly (see Section 9.5).

5. Press the 2ND FUNC key again to place the printer in Primary Function mode. You may now adjust spacing and LPI as required for your printing job. See Section 9.7 for detailed instructions.

6. Move the forms lever to the "LOAD" position.

7. Insert a cut sheet into the printer, making sure the left edge of the sheet is aligned with the right edge of the red cut sheet indicator (refer to Figure 8-4).
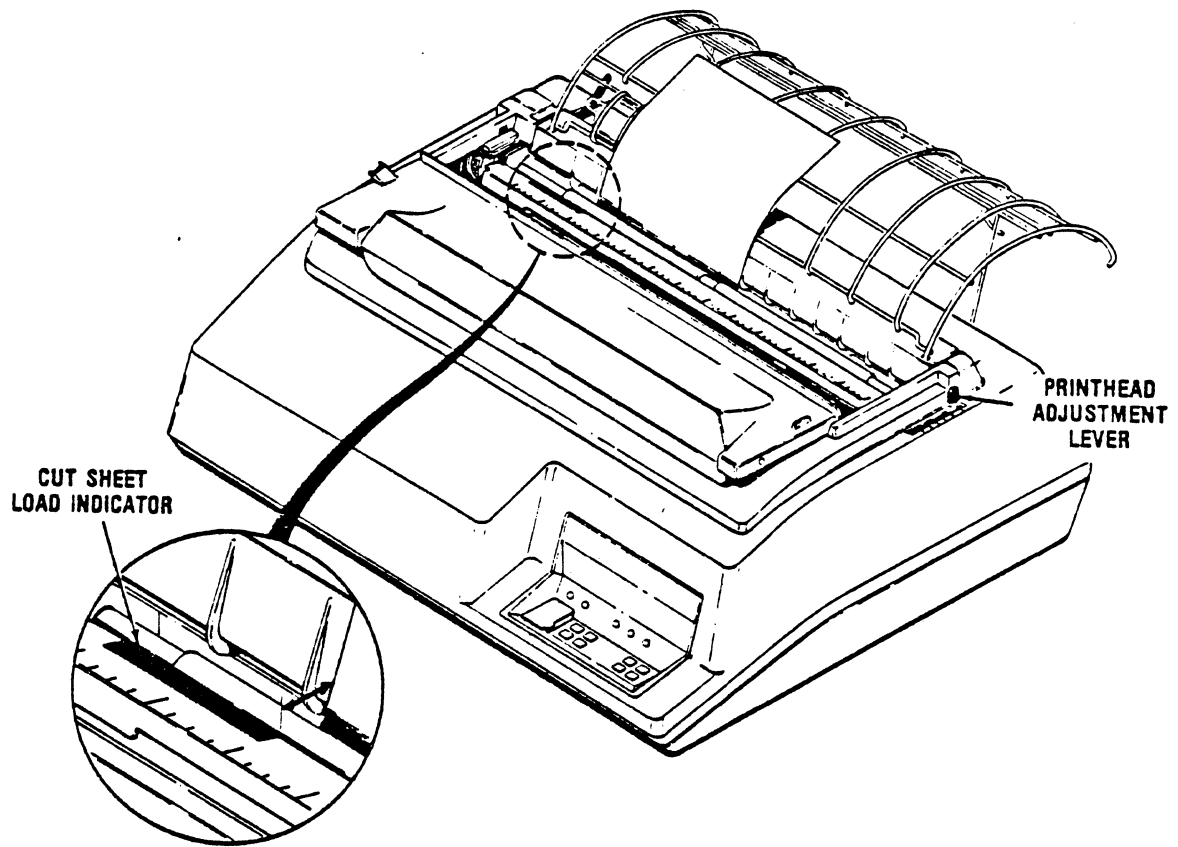
Figure 8-3 Cut Sheet Loading

8. Move the forms lever to the "SHEET" position.

9. First press the 2ND FUNC switch and then the F1 switch. The printer will automatically load the sheet for printing.

10. Press the ENABLE switch. Your ISI 487 is now ready to print.

8.6 MANUAL CUT SHEET REMOVAL

When the last line has been printed (1/2" from the bottom of the sheet) on the sheet currently in the printer, the alarm will sound and the LED Status Indicator will display "1." Follow the procedure below to remove the paper:

1. Press the HOLD switch.

2. Move the forms lever to "LOAD" and manually remove the sheet from the printer.

To remove a sheet when printing does not reach the bottom of the sheet, follow the procedure below:

1. Press the HOLD switch to interrupt printing.

2. Advance the sheet of paper by pressing FF or ↑.

3. Move the forms lever to the "LOAD" position and manually remove the sheet from the printer.

8.7 RELOADING SINGLE CUT SHEETS

After manually removing the previous sheet of cut paper, follow the procedure below to reload the ISI 487 with another sheet:

1. Remain in the HOLD condition, make sure the HOLD indicator is lit.

2. Move the forms lever to the "LOAD" position.

3. Follow steps 7-10 as described in Section 8.5.

Chapter 9

HOW TO OPERATE THE ISI 487 PRINTER

The switches that you'll use to control the operation of the ISI 487 Printer are located on the operator control panel on the front of the printer. The membrane-type panel lets you select a switch with the touch of a finger. Most of the switch functions have to do with setting printing specifications such as forms handling and print quality, format parameters such as forms length and maximum presentations position, or directing the printer run certain tests.

9.1 HOLD PRINT MODE

The HOLD switch is used to prevent printing or to stop printing in process. This non-printing state is referred to as the Hold Print mode. All of the switches on the control panel (except HOLD) can only be set when the printer is not printing, which means that the HOLD switch must be pressed prior to using any other switch.

9.2 SECOND FUNCTION MODE

Most of the time, your printer is in Primary Function mode. This refers to the functions printed in white on the switches. In Primary Function mode, the default mode of your ISI 487, the primary functions are operational. Pressing the 2ND FUNC switch will put the printer in Second Function mode. You can change the default format settings while in Second Function mode. This means that the switches with the functions printed in red can now be used to enter numbers specifying certain format parameters such as forms length, maximum presentation position, or to specify certain test numbers. These settings can be made a permanent (selected upon power-up) feature of your printer by using the Second Function mode CONFIG switch.

An example of how to determine the page length you want for a particular job and how to set it is included in the FL (FORMS LENGTH) switch description in Section 9.5.1.

9.3 DEFAULT SWITCH SETTINGS

When the printer is powered-up, certain default format parameters are already set. You can change them for your specific job by setting the appropriate switches on the operator panel. You can even change the default settings by using the CONFIG switch (see the individual description on the CONFIG switch). If you do not change the default settings, the following default settings will be in effect:

DEFAULT SETTINGS	MEANING
MONO CASE	Prints in uppercase letters only
SINGLE SPACE	Prints with single spacing between lines
6 LPI	Prints six lines per inch
FORMS LENGTH	Prints 66 lines per page
MAXIMUM PRESENTATION POSITION	Prints 132 characters per line
200 CPS, DOT MATRIX	Prints 200 CPS, 10 CPI, 7x9 dot matrix print quality
FORMS HANDLING	Handles continuous fanfold forms

9.4 PRIMARY FUNCTION SWITCH DESCRIPTIONS

While the printer is actually printing there is only one switch that can be used: HOLD. All other switches can only be used when printing is stopped, which means the HOLD switch must be set in order to set these other switches.

The function of each primary function switch on the operator control panel and its use are fully described in the paragraphs that follow. Figure 9-1 illustrates the Primary Function switches.
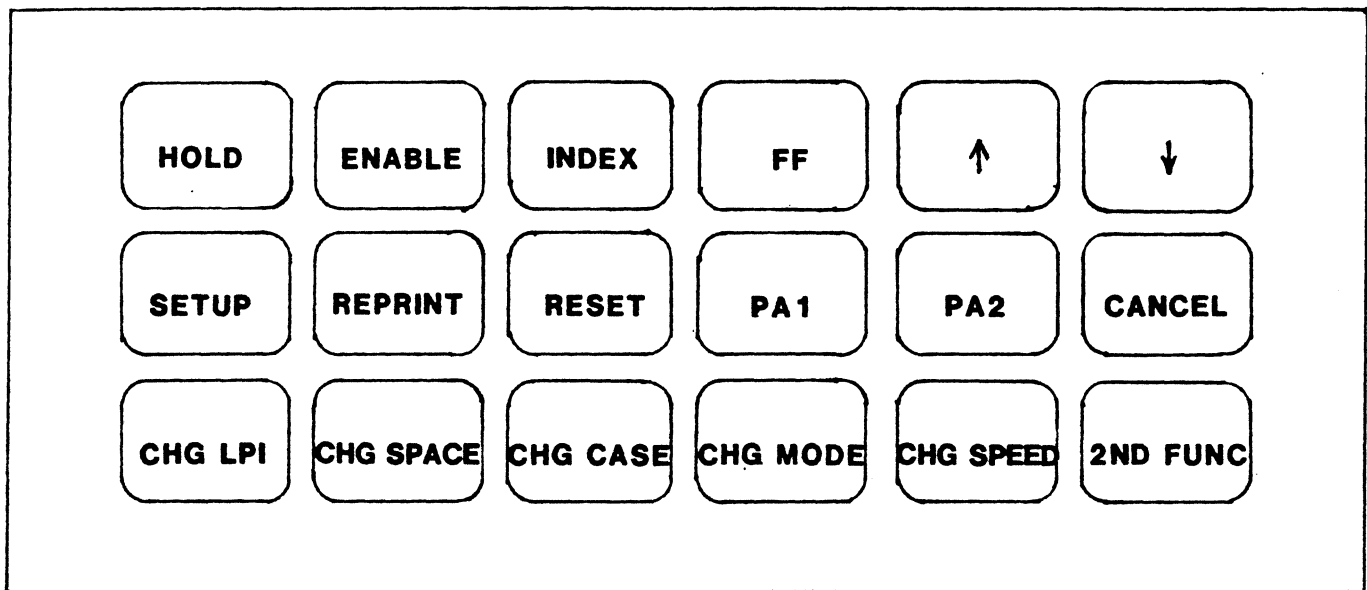
Figure 9-1 Primary Function Switches

9.4.1 HOLD

Press the HOLD switch to tell the printer to stop printing.

- The HOLD PRINT light comes on.

- The READY light flashes in SCS mode and goes out in non-SCS mode.

To make the printer ready to print again, press the ENABLE switch.

9.4.2 ENABLE

Press the ENABLE switch to continue normal printing.

- The HOLD PRINT light goes out.

- The READY light is on steadily.

All error conditions must be cleared before this switch can function.

9.4.3 INDEX

Press the INDEX switch while in Hold Print mode to advance the paper one line.

9.4.4 FF (FORM FEED)

Press the FF switch while in Hold Print to advance the paper to the next top of form (TOF), when using fanfold forms. In cut sheet mode, the FF key advances the current sheet of paper for removal.

9.4.5 ↑

Press the ↑ switch while in Hold Print mode to advance fanfold paper forward in increments of 1/120th of an inch and cut sheet paper in increments of 1/108th of an inch.

To feed paper continuously, depress the switch for longer than 1/2 second and paper moves forward until the switch is released.

9.4.6 ↓

Press the ↓ switch while in Hold Print mode to reverse the movement of fanfoldpaper in increments of 1/120th of an inch and cut sheet paper in increments of 1/108th of an inch.

To feed paper continuously, depress the switch for longer than 1/2 second and paper moves continously backward until the switch is released.

9.4.7 SETUP

Press the SETUP switch while in Hold Print mode. The printer will print "H's" at 10 CPI between the left margin and the current MPP (maximum presentation position) or right margin. When the MPP is reached, the printer will return to the left margin, but will not advance the forms. This feature is useful for viewing the current MPP and forms alignment.

9.4.8 REPRINT

Press the REPRINT switch while in Hold Print mode to print the contents of the print buffer.

This feature is useful if the printer runs out of paper while printing. If the printer is able to execute the command, the contents of the buffer are printed from the beginning after ENABLE is pressed. REPRINT must be selected prior to selecting ENABLE after printing has been interrupted. Otherwise, data in the print buffer is lost.

NOTE

The REPRINT switch is not active in SCS mode.

9.4.9 RESET

At this time, the RESET switch on your operator control panel is reserved for an unspecified future option.

9.4.10 PA1 and PA2

These switches are referred to as Program Attention switches. If the SCS (SNA Character String) feature is operational on your printer, these switches can be selected while in the SCS mode to transfer printing control to the application program.

9.4.11 CANCEL

This switch is functional only if the SCS (SNA Character String) feature is operational on your printer. If the printer is in SCS mode, press CANCEL while in Hold Print mode to stop printing.

9.4.12 CHG LPI

Pressing this switch while in Hold Print mode determines the number of lines per inch your ISI 487 will print. The current status of this switch is defined by the 8 LPI light. 6 LPI is the default setting at power up. Press the HOLD switch, then press CHG LPI.

- The 8 LPI light comes on.

- Your ISI 487 will print at 8 LPI.

Press the CHG LPI again.

- The 8 LPI light will go out.

- The printer will return to 6 LPI.

NOTE

When changing LPI, is is assumed that you are at TOF.
If you specify double spacing along with a setting of
6 LPI (8 LPI), you will actually get only (4) lines
per inch.

9.4.13 CHG SPACE

Pressing this switch while in Hold Print mode determines the spacing between lines that your ISI 487 prints. The current status of this switch is defined by the DOUBLE indicator. Single spacing is the default setting at power up. Press the HOLD switch, then press CHG SPACE.

- The DOUBLE light is on.

- The printer will print with double spacing.

Press the CHG SPACE switch again.

- The DOUBLE light goes out.

- The printer will return to single spacing.

NOTE

When changing SPACE, it is assumed that you are at TOF.

9.4.14 CHG CASE

In non-SCS mode in Hold Print mode, this switch tells the printer which case to print letters in. The current status of this switch is defined by the DUAL CASE indicator. Mono case is the default setting at power-on: letters are printed in uppercase only. Press the HOLD switch, then press the CHG CASE switch.

- The DUAL CASE light comes on.

- The printer will print letters in upper and lowercase.

Press the CHG CASE switch again.

- The DUAL CASE light goes out.

- The printer will return to Mono Case printing.

NOTE

In SCS mode, the printer operates only in Dual Case. Mono case setting will be overridden.

9.4.15 CHG MODE

Pressing this switch while in Hold Print mode determines what type of paper the printer is ready to handle. The current status of this switch is defined by the CUT SHEET indicator. Fanfold forms mode is the default setting at power-on. Press the HOLD switch, then press the CHG MODE switch.

- The CUT SHEET light comes on.

- The ISI 487 is now ready to handle single cut sheet paper.

Press the CHG MODE switch again.

- The CUT SHEET light goes out.

- The ISI 487 returns to fanfold forms mode.

9.4.16 CHG SPEED

Pressing this switch while in Hold Print mode determines the print quality of the ISI 487. The current status of this switch is defined by the NLQ light. 200 CPS dot matrix printing is the default setting at power-on. Press the HOLD switch, then press the CHG SPEED switch.

- The NLQ light will come on.

- The ISI 487 will print 50 CPS near letter quality print.

Press the CHG SPEED switch again.

- The NLQ light will go out.

- The ISI 487 will return to dot matrix printing.

9.4.17 2ND FUNC

Pressing this switch while in Hold Print mode activates the function printed in red on the switches (lower portion of the keypad), thus placing the printer in Second Function mode. When this switch is pressed, the HOLD PRINT light will begin flashing and "ccc" will appear in the LED window display. To fully understand how the Second Function switches work, see Section 9.5.

9.5 SECOND FUNCTION SWITCH DESCRIPTIONS

The Second Function switches allow you to set and reset a variety of different parameters, including forms length and maximum presentation position, with temporary or permanent values. Read the switch descriptions below carefully and follow the procedures in the order they are given. Figure 9-2 illustrates the Second Function switches.

NOTE

If any switch, other than those with designated Second Functions, is pressed while the printer is in Second Function mode, the printer will immediately return to primary function.

9.5.1 SET FL (FORMS LENGTH)

The default setting for forms length is 66 lines at power-up. To view the current setting, place the printer in Second Function mode (by pressing the 2ND FUNC switch while in Hold Print mode) and press the SET FL switch. The LED Status Indicator displays the current lines per page as a 3-digit number (066 for 66 lines per page).

You can now select a new forms length in the range of 0 to 999 by pressing the 1, 10, and/or 100 switches.(Or, you may exit the Second Function mode by pressing the 2ND FUNC switch. You are now in primary mode.)

To determine the number of lines to select for your new forms length, you must consider three things:

- The length of the paper form in inches.

- The number of lines you want to have print per inch.

- The line spacing you want: single or double.

9.5.1.1 Forms Length Setting Example

The default forms length setting at power-on is based on a standard form length of 11 inches. The number of lines per inch (LPI) defaults to 6 LPI. Multiply 11 inches times 6 lines per inch and the total lines per page is 66, which is the default Forms Length setting at power-on. In this example, we'll assume that the paper form length is 11 inches (279.4mm) and that you want 8 lines to the inch, single spaced:

1. You want to print 8 lines per inch so you set the printer for 8 LPI (see Section 9.4.12).

2. You want single spacing, which is the default setting for the printer at power-on.

3. Multiply the paper length by 8 for single spacing (11 x 8 = 88). (For double spacing, set the CHG SPACE switch and multiply the paper length by 4 (11 x 4 = 44).

4. Put the printer in Second Function mode (see Section 9.4.17) and press the Set FL switch. Now enter the page length value as a three-digit number by using the 1, 10, and/or 100 switches and viewing your entry in the LED status indicator.

5. Press the SET FL switch again. The printer is back in Primary Function mode and will select the value you have just set. The display window will be blank. This value is temporary and will not remain once the printer has been powered off. To set the value permanently (selected during power-on) press the 2ND FUNC switch, then press the CONFIG switch.

9.5.2 SET MPP (MAXIMUM PRESENTATION POSITION)

The default setting for maximum presentation position is 132 characters at power-on. To view the current setting, place the printer in Second Function mode (by pressing the 2ND FUNC switch while in Hold Print mode) and press the SET MPP switch. The LED Status Indicator displays the current characters per line as a 3 digit number.

You may now select a new maximum presentation position setting in the range of 1 to 132 (1 to 220 for 16.67 CPI), or you may exit the Second Function mode by pressing the 2ND FUNC switch. Use the 1, 10, and/or 100
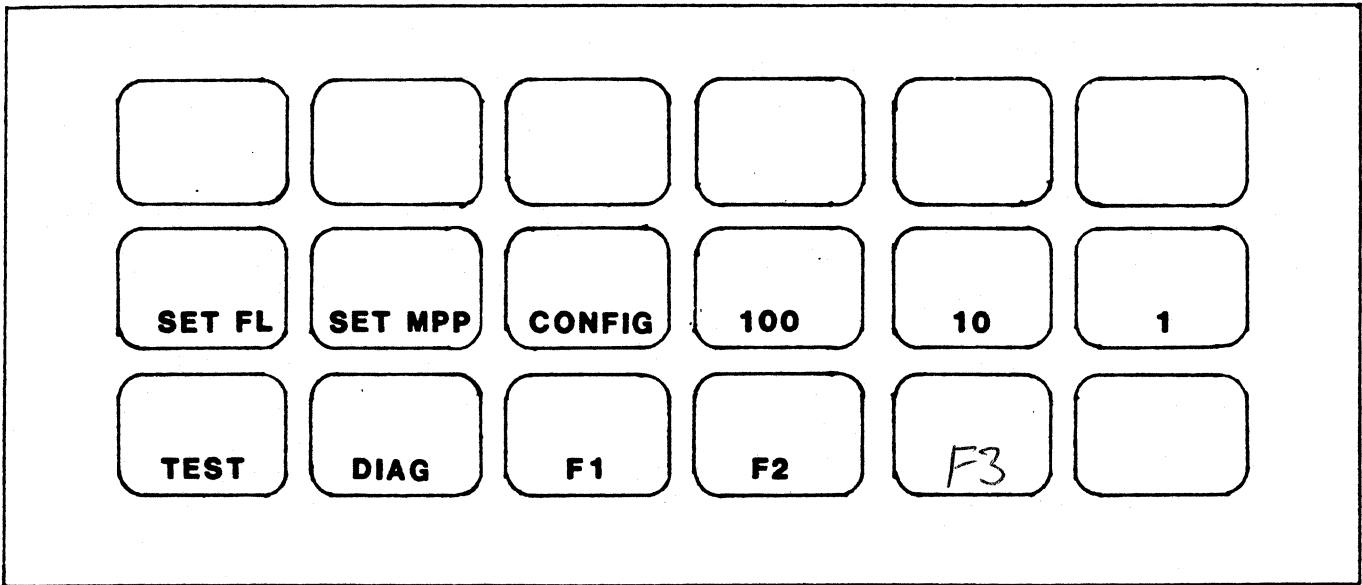
Figure 9-2   Second Function Switches

switches to select your new value. You can check your work by viewing the new parameter in the LED Status Indicator.

Press the SET MPP switch again. The printer is back in Primary Function mode and will select the value you have just set. This value is temporary and will not remain once the printer has been powered off. The LED Status Indicator will be blank.

To set the value permanently (selected during power-on) press the 2ND FUNC switch, then press the CONFIG switch.

9.5.3 CONFIG

While in Second Function mode, the CONFIG switch allows you to set chosen parameters permanently. Values set permanently will remain in the printer's memory and are ready for use at power-on.

Primary Function mode parameters such as LPI, print spacing, character case, print type, and paper handling are set temporarily as explained under each switch definition. These parameters can also be set permanently by using the CONFIG key. To set these features permanently, follow the procedures below:

1. Place the printer in the Hold Print mode.

2. While in Primary Function mode, select the desired parameters (see the definition of each switch you are interested in setting under "Primary Function Mode Switches").

3. Press the 2ND FUNC switch.

4. Press the CONFIG switch.

The CONFIG key also allows you to set Second Function mode parameters such as SET FL and SET MPP permanently. See the individual switch descriptions for the setting procedure.

9.5.4 100, 10, and 1

The number 100, 10, and 1 switches are used to change page and line lengths, and to select a specific Test number. The entered number indicating a new page length, line length, or test number is displayed on the Status Indicator. For complete instructions on how to use these switches refer to "SET FL", "SET MPP", and "DIAG".

9.5.5 TEST

While in Second Function mode, the TEST switch is pressed to perform a self-test.

- The LED Status Indicator will display the current test number.

- The TEST light comes on.

For detailed instructions on the Self-Test Procedure, see Section 10.3. To change the current test number, follow the procedure outlined in the DIAG switch description.

9.5.6 DIAG

While in Second Function mode, the DIAG switch allows you to choose the number of test you wish the printer to run. The default setting for the test number is 0. To view the current setting, place the printer in Second Function mode (by presssing the 2ND FUNC switch while in Hold Print mode) and press the DIAG switch. The LED status indicator displays the current test number as a 3-digit number (003 for test #3).

Use the "1" switch to select your new test number (see Section 9.3 for a list of the available self-tests and their corresponding numbers). The LED Status Indicator will display your selection.

Press the DIAG switch again. The printer is back in Primary Function mode and will select the value you have just set. This value is temporary and will not remain once the printer has been powered off. The LED Status Indicator will be blank.

═══

NOTE

The DIAG setting cannot be set permanently.

═══

9.5.7 F1

While in Second Function mode, the F1 switch is used to assist the printer in cut sheet paper insertion. After the F1 switch is pressed, the printer will automatically load the sheet currently inserted for printing. The F1 switch should only be pressed at the point indicated in Section 8.6 as part of the loading process.

9.5.8 F2

Press the F2 switch while in Second Function mode to select the 16.67 CPI compressed printing mode.

- The FUNCTION light will come on.

- The ISI 487 will print 16.67 CPI.

To set 16.67 CPI permanently (the printing mode selected during power-on), press the 2ND FUNC switch, then press the CONFIG switch.

NOTE

Switch #6 on switch pack E81 must be in the UP position for 16.67 CPI printing to take place. See Section 9.7.3 for more information.

9.5.9 F3

At this time, the F3 switch is reserved for an unspecified future option.

9.6 WHAT THE LIGHTS MEAN

The lights on the operator control panel light to indicate the current status of a variety of printer functions. The paragraphs below describe each light and Figure 9-3 illustrates their location on the panel.

9.6.1 READY

The READY light comes on when the printer is ready to receive data from the controller. The light goes out when one of the following conditions occur:

- Printer enters Hold Print mode.

- Printer enters Test mode.

- Check condition occurs (error detected).

- Printer is powered-off.

- Printer runs out of paper.

While the printer is in Hold Print mode, the READY light flashes on and off to indicate the printer is operating in SCS mode.

9.6.2 HOLD PRINT

The HOLD PRINT light comes on when the printer is in the Hold Print mode. When the printer is in Second Function mode, the HOLD PRINT light flashes on and off.

9.6.3 TEST

The TEST light comes on when the Self-Test or a selected diagnostic test is being run. It goes out when one of the following conditions occurs:

- Printer completes the Self-Test or a selected diagnostic test.

- The ENABLE switch is pressed.

9.6.4 CHECK

The CHECK light comes on when an error condition occurs.

- The printer stops printing.

- The Status Indicator displays an error code (see Section 10.1 to determine the meaning of error codes).

9.6.5 CU SIGNAL

The CU (Control Unit) SIGNAL light comes on when the printer is in communication with the controller. If signals from the controller are not received approximately every 40 seconds, the light goes out after three time-outs.

9.6.6 DOUBLE

The DOUBLE light is on when the printer is set to insert one blank line between printed lines.

9.6.7 DUAL CASE

The DUAL CASE light is on when the printer is set to print in upper and lower case.

9.6.8 8 LPI

The 8 LPI light is on when the printer is set to print 8 lines per vertical inch.

9.6.9 CUT SHEET

The CUT SHEET light is on when the printer is set to handle single cut sheets of paper.

```
 _____
|                                                |
|   ┌─────────────┐                              |
|   │  ┌┐ ┌┐ ┌┐   │   TEST      DOUBLE   CUT SHEET|
|   │  8  8  8    │                              |
|   │  └┘ └┘ └┘   │                              |
|   └ ─ ─ ─ ─ ─ ─ ┘   CHECK    DUAL CASE    NLQ  |
|                                                |
| READY    HOLD PRINT  CU SIGNAL   8 LPI  FUNCTION|
|_____|
```
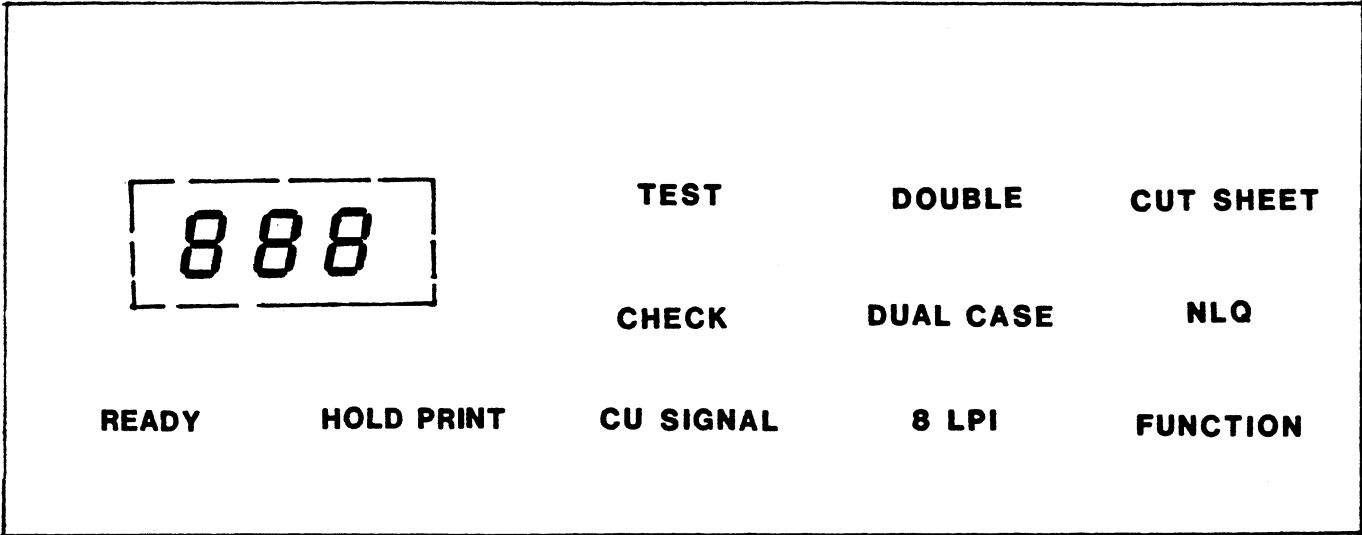
Figure 9-3 ISI 487 Lights and Status Indicator

9.6.10 NLQ

The NLQ light indicates that the printer is set to print 50 CPS near letter quality printing at 10 CPI.

9.6.11 FUNCTION

The FUNCTION light indicates that the printer is set to print the compressed mode of printing at 16.67 CPI.

9.7 USER-SELECTABLE OPTIONS

Two switch packs are located inside the right-hand cut-out window on the rear of the printer housing (see Figure 9-4): E60 and E81. E60 switches control model and language selection and E81 provides access to special printing functions. All ISI 487 option switches are read and their values stored, at power-up only. Switches are defined to be "1" when they are in the UP position.

Figure 9-4   E60 and E81 Option Switches

9.7.1 LANGUAGE SELECT SWITCH SETTINGS

The following chart specifies the settings of switches 1 thru 5 on E60 for each language supported by the ISI 487. Settings not given default to English, U.S.

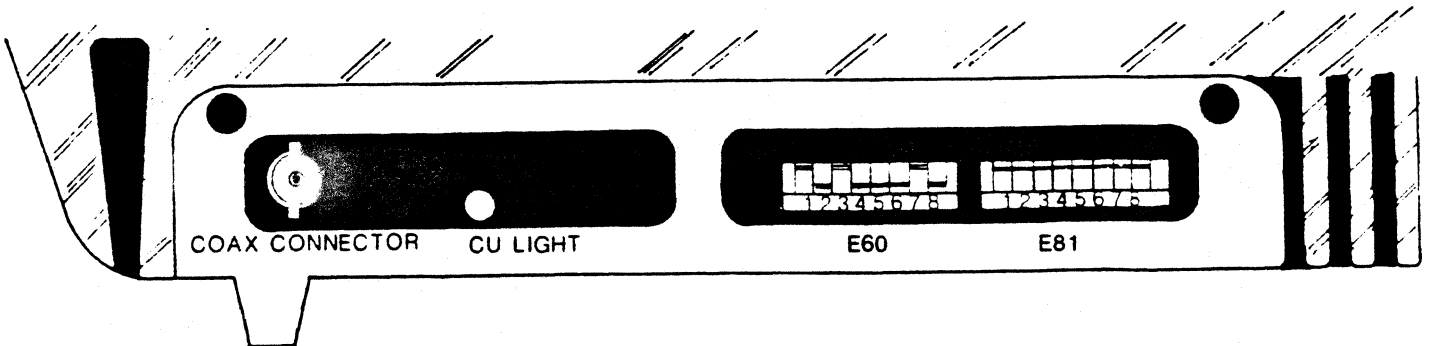| SWITCH					
1	2	3	4	5	LANGUAGE
0	0	0	0	0	English, U.S.
0	0	0	0	1	Austrian/German
0	0	0	1	0	Austrian/German Alt.
0	0	0	1	1	Danish/Norwegian
0	0	1	0	0	Danish/Norwegian Alt.
0	0	1	0	1	Finnish/Swedish
0	0	1	1	0	Finnish/Swedish Alt.
0	0	1	1	1	French
0	1	0	0	0	Italian
0	1	0	0	1	Portugese Alt.
0	1	0	1	0	Spanish
0	1	0	1	1	English, U.K.
0	1	1	0	0	Belgian
0	1	1	0	1	International
0	1	1	1	0	Japanese/English
0	1	1	1	1	Canadian/French
1	0	0	0	0	Brazilian
1	0	0	0	1	Canadian Bi-lingual
1	0	0	1	0	reserved
1	0	0	1	1	reserved
1	0	1	0	0	reserved
1	0	1	0	1	reserved
1	0	1	1	0	reserved
1	0	1	1	1	reserved

The following sets enable the right-to-left printing mode:

SWITCH					
1	2	3	4	5	LANGUAGE
1	1	0	0	0	EBCDIC, English
1	1	0	0	1	Hebrew, A
1	1	0	1	0	Hebrew, B
1	1	0	1	1	EBCDIC, English
1	1	1	0	0	"
1	1	1	0	1	"
1	1	1	1	0	"
1	1	1	1	1	"

Switch in DOWN position = 0   Switch in UP position = 1

IMPORTANT

When a right-to-left language set has been selected,
the CHG CASE key and its associated indicator, DUAL
CASE, control and indicate print direction. Thus,
CHG CASE must be pressed (and the DUAL CASE indicator
lit) to enable right-to-left printing.

9.7.2 IBM MODEL SELECT SWITCHES

The following chart specifies the settings of switches 6 thru 8 on E60
for the various Models supported by the ISI 487:

		SWITCH		
IBM MODEL	6	7	8	CODE VALUE
-	0	0	0	0
1	0	0	1	1
2	0	1	0	2
3	0	1	1	3
4	1	0	0	4
5	1	0	1	5
-	1	1	0	6
-	1	1	1	7

Switch in DOWN position = 0   Switch in UP position = 1

Undefined codes: 0 defaults to IBM Model 2. 6 and 7 default to IBM Model 4.

9.7.3 SPECIAL FUNCTION SWITCH SETTINGS

Switches 1 through 8 on switch pack E81 control the selection of special
printing functions offered by the ISI 487. These functions and their
required switch settings are outlined in the chart below:

SWITCH #	FUNCTION FOR UP SETTING	FUNCTION FOR DOWN SETTING
1	do not honor NVM*	honor NVM*
2-5	reserved	reserved
6	16.67 CPI	do not print 16.67 CPI
7	print null lines	do not print null lines
8	print form feed on local copy	do not print form feed on local copy

Switch in DOWN position = 0   Switch in UP position = 1

*NVM = "Non-volatile memory," or the ability of the ISI 487 memory to store
certain parameters as requested by the operator.

9.8 STATUS INDICATOR

You can monitor the operation of your printer by reading the various codes displayed on the Status Indicator. The Status Indicator is a three-digit LED display located in the center of the operator control panel. The information that may be displayed is as follows:

- Status code when the printer requires operator attention (for example, when the printer runs out of paper) see Section 10.1 for a list of the Operational Status Codes and their meanings.

- Current forms length setting is displayed when you press the 2ND FUNC switch and then the SET FL switch.

- Current maximum presentation position is displayed when you press the 2ND FUNC switch and then the SET MPP switch.

- Current test number selected is displayed when you press the 2ND FUNC switch and then the DIAG switch.

9.9 AUDIBLE ALARM

When the printer requires your attention, the audible alarm sounds ("beeps") a one second tone. It continues to sound the tone at regular intervals until you press the HOLD swtich. The conditions which the audible alarm will draw your attention to are:

- The printer is out of paper.

- An error is detected and the CHECK light is on.

Chapter 10

WHAT TO DO IF YOU HAVE A PRINTER PROBLEM

Most of the problems you may encounter during normal operation of the ISI 487 are referred to as operational problems, which can be fixed by the operator quite easily. When a problem occurs, look at the Status Indicator to see if a code is displayed. If there is a code, refer to Section 10.1 which lists the most common operational status codes and their meanings.

10.1 OPERATIONAL STATUS CODES

Table 10-1 is for you to reference when a code is displayed on the Status Indicator. The codes listed in Table 10-1 appear during normal operation of the printer when a condition arises that an operator can easily fix. For example, when the printer runs out of paper the "1" code is displayed on the Status Indicator. A status code is always accompanied by the alarm sounding and the CHECK light coming on.

Table 10-1

OPERATIONAL STATUS CODES

CODE	DESCRIPTION
1	Paper out
2	Cover open
3	Paper out and cover open
4	Head jam
5	Paper out and head jam
6	Cover open and head jam
7	Paper out, cover open and head jam
10	Head jam
11	Head jam and paper out
12	Head jam and cover open
13	Head jam, paper out and cover open
14	Head jam
15	Head jam and paper out

```
16      Head jam and cover open
17      Head jam, paper out and
        cover open
999     Power failure
```

After locating the code definition, refer to Section 10-2, "Problem Recovery Procedures." Follow the suggested corrective action for the problem indicated by the error code. If the problem cannot be corrected by the procedure suggested, contact your service representative or qualified service personnel at Interface Systems, Inc. by calling (313) 769-5900.

10.2 PROBLEM RECOVERY PROCEDURES

The problem recovery procedures described in this section are designed to help you determine whether the problem is an operational one or a machine one. Machine problems require repair service.

If the Recovery Procedure for your problem symptom does not fix the problem or if you cannot find the symptoms listed, contact your service representative or the qualified service personnel at Interface Systems, Inc. at (313) 769-5900.

To use the Problem Recovery Procedures:

1. Find the symptom in the left-hand column of Table 10-2 that best describes your problem.

2. Follow the suggested corrective action described in the opposite column. Please note that most of the status codes require more than one corrective action.

Table 10-2

PROBLEM RECOVERY PROCEDURES

SYMPTOM	CORRECTIVE ACTION
Status code #1, #3, #5, #7, #11, #13, #15, or #17 is displayed The alarm sounds and the CHECK light is lit	Renew paper supply
Status code #2, #3, #6, #7, #12, #13, #16, or #17 is displayed The alarm sounds and the CHECK light is lit	Close the top and/or acrylic covers

Status code #4, #5, #6, #7, #10, or #11-#17 is displayed The alarm sounds and the CHECK light is lit. The print head is not moving or print quality is distorted.	Make sure the Forms Lever is not in the "LOAD" position. Remove any paper (or any other object) which may be jamming the print head. Reload paper as necessary.
Paper is tearing and/or ink is smearing on the paper	Adjust the print head impression See Section 10.3.
Status code #999 is displayed A power failure has occured	Turn the printer off for 5-10 seconds, then power on.

10.3 PRINT HEAD IMPRESSION ADJUSTMENT

The print head can be adjusted in or out for different form thickness to provide optimum print quality. If your ISI 487 is delivering inferior print quality, it may be the result of a change in forms or printing specifications. To adjust the print head impression accordingly, perform the following steps:

1. Make sure paper is loaded and the forms lever is in the "FORMS" or "SHEET" position.

2. While manually moving the print head from side to side move the head adjustment lever (see Figure 10-1) in or out until the smudging occurs or paper rippling occurs, then, move the head adjustment lever back one position.

3. Perform a self-test while the printer is in the Hold Print mode, see Section 10.4, Running a Self-Test.

4. Check the printout to ensure good clean print quality. If the print is too dark or too light adjust the print head in or out as required.
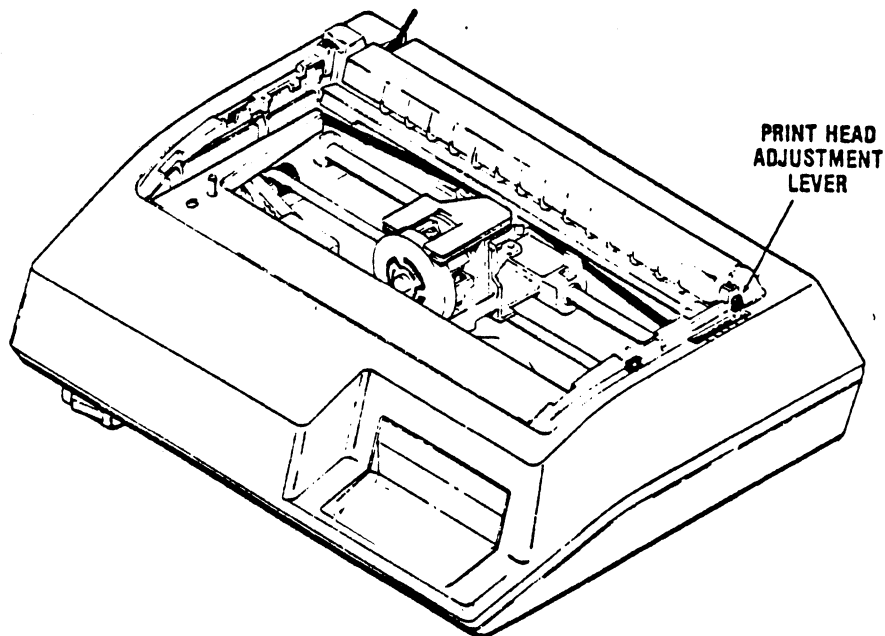
Figure 10-1 Print Head Impression Adjustment

10.4 RUNNING A SELF-TEST

In the event of a printer error the following procedure should be followed to perform a self-test. An accurate diagnosis of the problem can then be made by consulting Table 10-3.

1. Place the printer in the Hold Print mode. Press the 2ND FUNC switch.

2. Press the DIAG switch to view the current test mode (see Table 10-3).

3. If you wish to change the test mode at the is time, press the "1" key until you arrive at the desired number. Push the DIAG key to store the test in the printer's memory (i.e. you must press DIAG to acheive the test, otherwise the printer will print the original test displayed).

4. Push TEST. The printer will run the test. If you wish to stop a lengthy test (such as 3, 4, 5, and 9) press the TEST key again.

5. When the test is over, the printer returns to the primary condition. In order to run another test, press 2ND FUNC again and repeat steps 2 through 4.

NOTE: Test #8, Auto-dump, is run in READY mode. To stop the test push the HOLD switch.

Table 10-3

SELF-TEST DIAGNOSTICS

0 - version and status
1 - version - print version, model, ROM checksum, status

```
2 - print status "Xxxyzab"
    X           - identifies the next 6 characters as a status code
    xx    80 - not defined
          40 - not defined
          20 - not defined
          10 - RESET
           8 - LPS order received
           4 - PRINT order received
           2 - ABORT order received
           1 - SSA order received
    y      F - printer is busy
           0 - printer is not busy
    z      F - printer is ENABLED and may alter adapter RAM
           0 - printer is DISABLED
    a      0 - no order received (or an illegal, 0, order was last)
           1 - last received order was Abort
           2 - last received order was SSA
           3 - last received order was Print
           4 - last received order was Load Programmed Symbols
         5-F these values are illegal at this time
    b      0 - last command received was DISABLE
           1 - last command received was ENABLE
           2 - last command received was RESET
           3 - last command received was SOP

3 - dump print buffer and variable RAM
4 - dump variable RAM only
5 - device dependent test (character dump print)
6 - not defined
7 - not defined
8 - Auto dump (as in 3) at the end of print
9 - print test (repeats until stopped)
```

Appendix A

PREVENTIVE MAINTENANCE

Although there are no regularly scheduled preventive maintenance procedures, it is advisable to inspect and clean the printer area periodically that is immediately accessible under the top cover.

Occassionally, during paper loading or ribbon replacement, inspect the printer for a build-up of lint or foreign material. If the build up of material is evident, clean the area with a lint free cloth.

Table A-1 below lists the maintenance occasionally required on certain areas of the printer. This maintenance may be required more or less frequently, depending on the printer application and operating environment.

Table A-1

PREVENTIVE MAINTENANCE

ASSEMBLY	MAINTENANCE
Covers	Clean all cover assemblies using a mild detergent and a lint-free cloth.
Internal Inspection	Remove the top cover and visually inspect the interior of the printer for loose wires, connectors, and hardware, chafing of cables, and worn or damaged parts.
Print Head and Carriage	After removing ribbon, use a light-bristle brush, carefully remove the dust and residue from the print head and carriage assembly.
Platen Assembly	Clean platen assembly using a mild detergent.

Appendix B

PROGRAMMING THE ISI 487 FOR SPECIAL PRINTING FUNCTIONS

The ISI 487 can be programmed, by sending escape sequences through the data stream, to perform special printing functions. Some of the printing functions are standard, such as 16.67 CPI Compressed Print and some are optional, such as the Large Character Label Printing option. Follow the instructions outlined below under the function you wish to control through programming.

B.1 SELECTING PRINT MODE

The print mode is controlled from the data stream by means of Interface Systems, Inc.'s defined "escape sequences." The print mode escape sequences are:

ESCAPE SEQUENCES	PRINT MODE SELECTED
&%Q0	200 CPS, 10 CPI dot matrix
&%Q1	50 CPS, 10 CPI, near letter quality (NLQ)
&%Q2	16.67 CPI Compressed Print
&%0E	Prints double width characters only on current line

To program the ISI 487, the user inserts one of the four character escape sequences into the data stream where the mode is to be changed. Any characters preceeding the "escape" will be printed using the old mode. Characters following the "escape" will be printed using the newly selected mode. The "escape" is not printed.

There are no restrictions on the use of these "escapes." However, when changing mode within a print line, the user should be aware that the printer counts characters, not inches, for horizontal positioning. Pad characters may be required when switching to a higher density (i.e., from 10 CPI to 16.67 CPI); some blank space will appear when switching to a lower density unless a CR code is inserted followed by pad characters.

B.2 PROGRAMMING INSTRUCTIONS FOR THE LARGE CHARACTER OPTION

The following information provides the programming rules for using the Large Character Option of the ISI 487. Large Character Label printing is an option and can only be performed by an ISI 487 so equipped. The Large Character Option can only be used in Variable Format Print mode (where lines are terminated by NL or EM codes) and in SCS mode subject to the restrictions listed in the addendum.

A Large Character print line is distinguished from a normal print line by starting with a Large Character print "header sequence." This header is &%P and must be the first three characters of any Large Character Print line (i.e., it should immediately follow a new line (NL) code. Large Characters are then programmed by specifying a "segment" or segments (up to 16) in a line. If a print line (defined as data between NL codes) contains a segment, it cannot contain other data to be printed, only other segments (although normal size 0.1 inch characters can be specified in a segment). Segments are delineated from one another by a "/." A segment is defined as:

   (E)   (S)   (X)   (Y)   (data)   (parenthesis not to be used)

where E is "/" (hex 61)

and "S" is a two digit size code indicating the height of the large characters in tenths of inches.

VALID SIZES (HEIGHT)	WIDTH
S = 01 for 0.1" characters (normal)	0.1"
S = 02 for 0.2" characters	0.1"
S = 04 for 0.4" characters	0.2"
S = 05 for 0.5" characters	0.25"
S = 06 for 0.6" characters	0.3"
S = 07 for 0.7" characters	0.3"

and X is a three digit number (001 to 132) specifying the starting print position of the large character and Y is a two digit number (00 to 99) specifying the number of lines down from the current print position the top of the large character line is to be printed.

"Data" are the actual character(s) to be printed in large sizes. Except in 0.1 inch high size, the only valid data characters are:

1. space

2. A thru Z

3. 0 thru 9

4. -, +, and .

In 0.1 inch high size, all valid 3270 EBCDIC characters will be printed.

> EXAMPLE: A line consisting of:
>
> &%P/0402103ABC(NL)
>
> will cause three large character vertical line spaces (0.1" high) "ABC" printed 0.4 inches high starting in print position 21.

More than one segment (a sequence) can be programmed between NL codes to specify mixed size characters in the same line as follows:

> &%P(E_1) (S_1) (X_1) ($data_1$)...(E_n) (S_n) (X_n) (Y_n) ($data_n$) (NL) where "n" is 2, 3, 4, or 5

The only restrictions on defining a sequence are:

1. A sequence can only have a mix of 0.1, 0.4, 0.5, 0.6, and 0.7 inch high characters.

2. $X_1 < X_2 < ... < X_n$ (ie., the segments making up a sequence must be specified in the same order as they are printed (left to right).

> IMPORTANT:
>
> 1. Any invalid sequence will be printed just as it appears in your data
>
> 2. When more than one segment within a sequence specifies printing at a particular point on the page, the last segment determines what is printed.

EXAMPLE:

ABC(NL)(NL)&%P/0700100ABC(NL)(NL)ABC(EM)

There are five lines in this sequence:

Line Number:

1. "ABC(NL)"
2. "(NL)"
3. "&%P/0700100ABC(NL)"
4. "(NL)"
5. "ABC(EM)"

Line number 1, 2, 4, & 5 -- Height will be normal line spacing of 6 lines per inch (0.166667 inches per line)

Line number 3 -- height will be large character line spacing of 10 per inch.

The total height of line number 3 will be 0.68400 inches or 6 lines times 0.1" plus 0.084" segment height.

Appendix C

PAPER SPECIFICATIONS

The ISI 487 uses tractor-fed single or multi-part forms or single cut sheets of paper. The paper you select should conform to the specifications listed in this appendix; otherwise, forms handling problems may occur.

C.1 FANFOLD FORMS DESIGN

Fanfold forms should fulfill the specifications listed below. See Figure C-1 for size specifications.

1. Forms may be glued or crimped.

2. Form thickness should not exceed .0204 in. (0.52 mm) when glued.

3. Crimps must be spaced a minimum of 2.0 in. (508 mm) along both edges of the forms and not within o.5 in. (12.7 mm).

4. Metal staples cannot be used.

5. Thickness:

   - Single part - 0.010 in. (0.25 mm) maximum

   - Multi-part - 0.0204 in. (0.52 mm) maximum, up to six part with carbon.

6. Weight:

   - Single part - 15-20 lb. bond (56 g/m2 to 75 g/m2)

   - Multi-part -

PLY	PAPER	CARBON
2	15 lb. (56 g/m2) bond	#7 (16.5 g/m2) tissue
3	15 lb. (56 g/m2) bond	#7 (16.5 g/m2) tissue
	12 lb. (45 g/m2) bond	

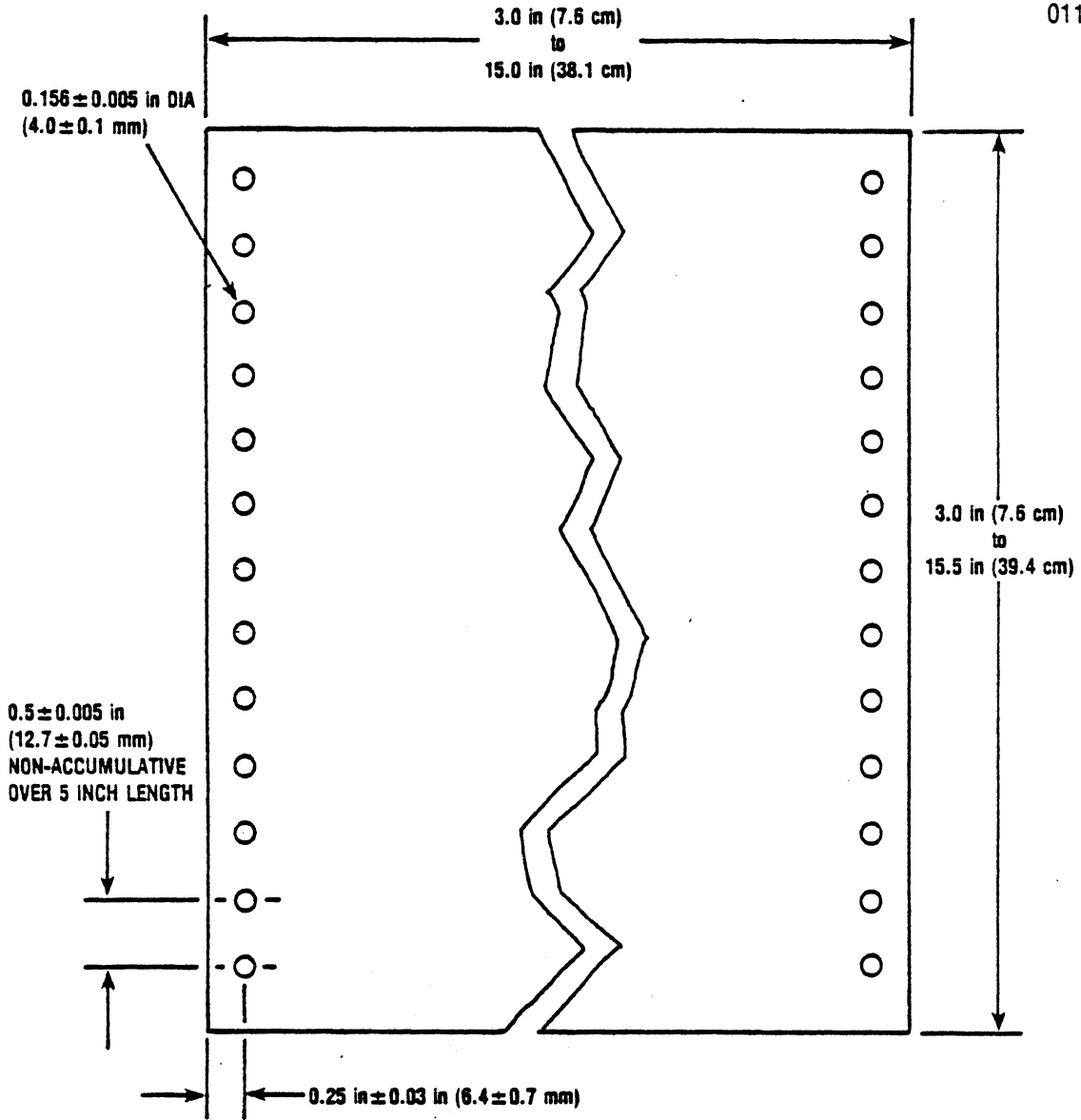3.0 in (7.6 cm)
to
15.0 in (38.1 cm)

0.156 ± 0.005 in DIA
(4.0 ± 0.1 mm)

3.0 in (7.6 cm)
to
15.5 in (39.4 cm)

0.5 ± 0.005 in
(12.7 ± 0.05 mm)
NON-ACCUMULATIVE
OVER 5 INCH LENGTH

0.25 in ± 0.03 in (6.4 ± 0.7 mm)

Figure C-1   Fanfold Forms Design

	12 lb. (45 g/m2) except last copy 15 lb. (56 g/m2)	#7 (16.5 g/m2) tissue
4-6		

C.2 CUT SHEET FORMS DESIGN

Cut sheet forms should fulfill the specifications listed below. For size specifications see Figure C-2.

1. Multi-part forms may be glued on the top or bottom.

2. Stapled forms may not be used.

3. Split forms with each side containing a different thickness or number of sheets are not recommended.

4. On multi-part forms, use 12 lb. (45 g/m2) as first copies with heaviest copies last.

5. On multi-part forms over four parts, use a 5 lb. (12 g/m2) carbon tissue.

6. Thickness/Weight

   - Single part - 20 lb. paper (70 g/m2) minimum

   - Multi-part - 0.024 in (0.52 mm) maximum

PLY	PAPER	CARBON
2	15 lb. (56 g/m2) bond	#7 (16.5 g/m2) tissue
3	15 lb. (56 g/m2) bond 12 lb. (45 g/m2) bond	#7 (16.5 g/m2) tissue
4-6	12 lb. (45 g/m2) except last copy 15 lb. (56 g/m2)	#7 (16.5 g/m2) tissue

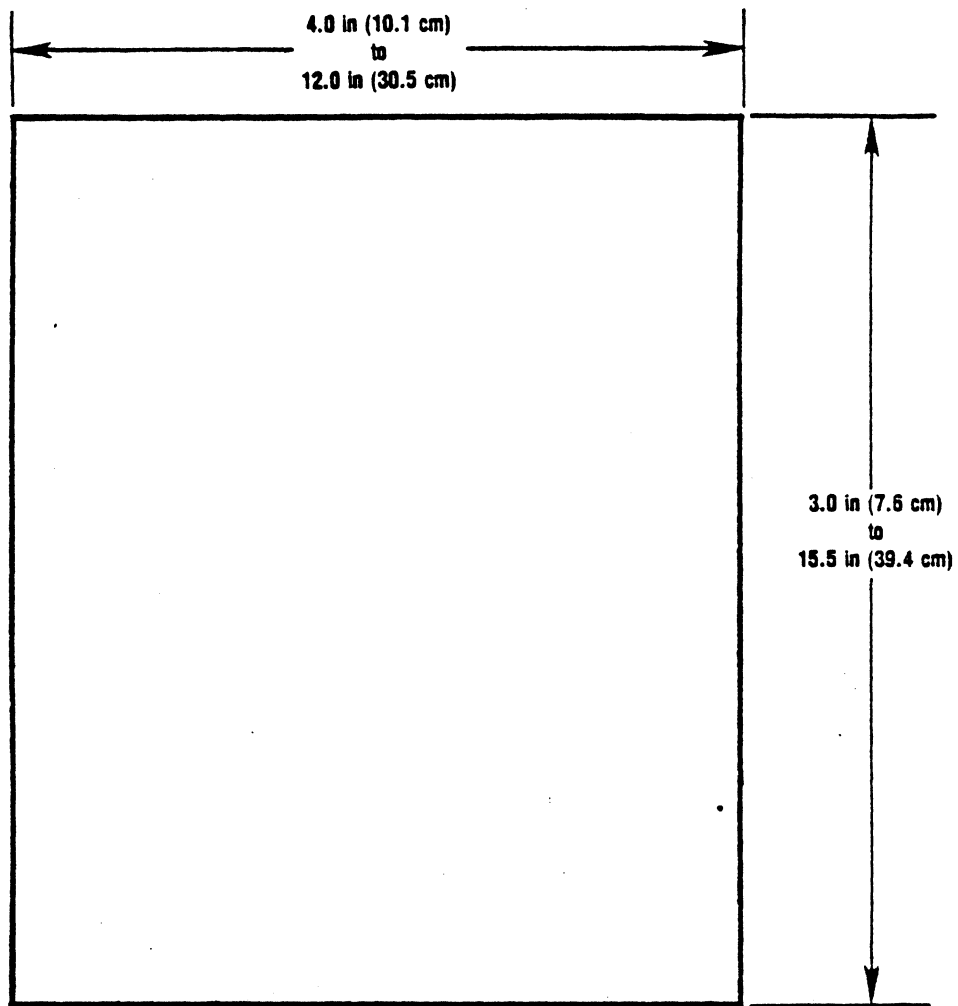**4.0 in (10.1 cm)**
to
12.0 in (30.5 cm)

3.0 in (7.6 cm)
to
15.5 in (39.4 cm)

Figure C-2   Cut Sheet Forms Design