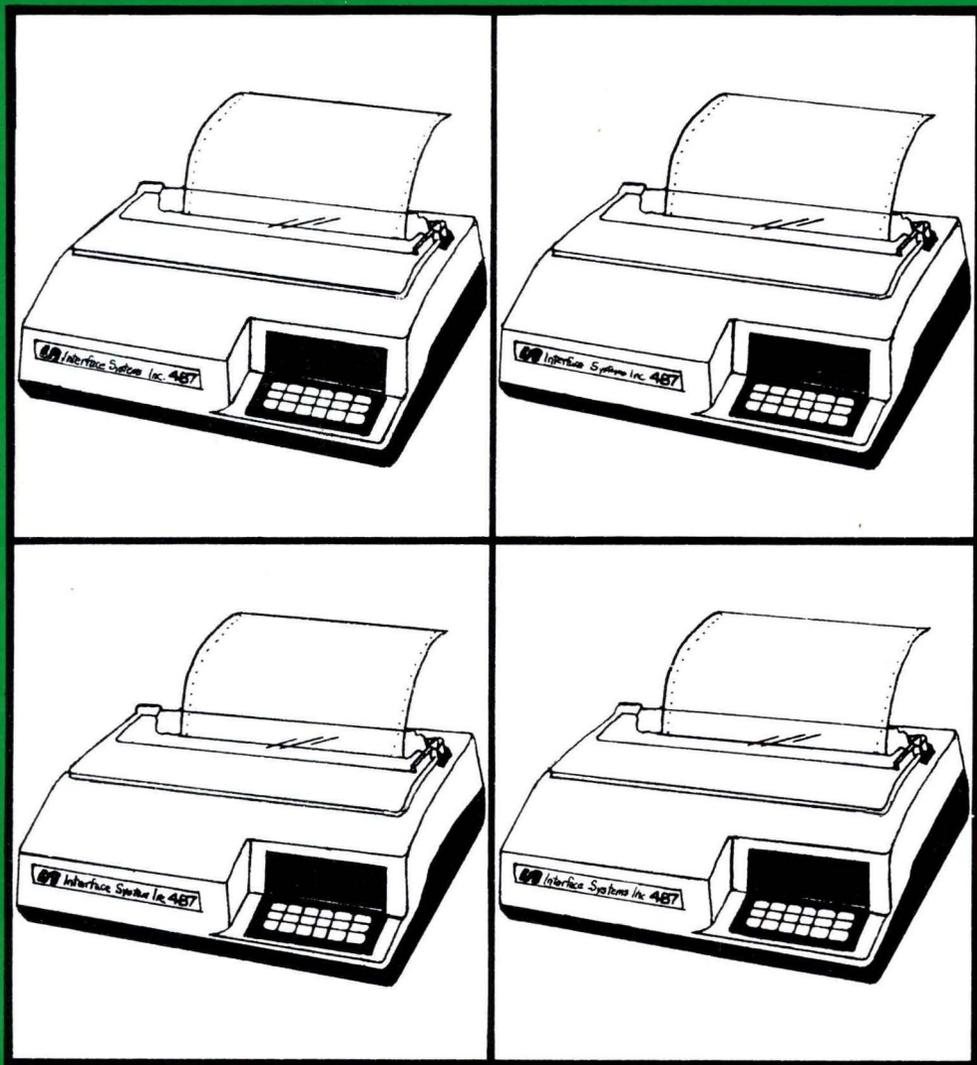


Operator's Guide

487



Interface Systems, Inc.

5855 Interface Drive
Ann Arbor, Michigan 48103

How to Use This Manual

Congratulations on your choice of the ISI 487 printer!

The difficult search for a great printer is over — now the fun part begins. This manual will guide you through all the procedures you'll need to set up and operate the ISI Model 487 printer, also known as the 487. If you are setting up your printer for the first time, be sure to read the sections in order. To help you find the information you need quickly and easily, this manual has been divided into three sections.

Section 1 — is a quick version of set up procedures to get you started now and teach you the details later. (pages 3-20)

Section 2 — is a detailed version which will tell you everything that section one didn't. (pages 21-50)

Section 3 — is an appendix section which will tell you special programming instructions and things that you won't need for every day use. (pages 51-83)

Now, let's get started!

Section 1

THE QUICK VERSION

. . . designed to get you set up and printing fast!

Table of Contents

FIRST, UNPACK YOUR PRINTER	5
NEXT, CHECK FOR DAMAGE	5
DO YOU HAVE THE RIGHT EQUIPMENT?	6
INSTALL YOUR PAPER GUIDE RACKS	6
LOAD THE RIBBON	8
TURN THE POWER ON AND TEST THE PRINTER	11
CONNECT THE 487 TO A CONTROLLER	12
LOAD THE PAPER	14
Loading Fanfold Forms	14
Loading Cut Sheets	16
HOW TO OPERATE YOUR PRINTER	17
The Front Panel	17
The Back Panel	18
CHECK THESE THINGS BEFORE YOU START PRINTING	19
WHAT TO DO IF YOU HAVE A PRINTER PROBLEM	20

Federal Communications Commission Radio Frequency Interference Statement

This equipment generates and uses radio frequency energy and if not used properly, i.e., in strict accordance with its operating instructions, may cause harmful interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when Class A equipment is operated in a commercial environment.

Operation of this equipment in a residential area is likely to cause interference, in which case the user, at his own expense, will be required to correct the interference.

Section 1

THE QUICK VERSION

First, Unpack Your Printer

Carefully follow the “Unpacking Instructions” attached to your 487.

Then:

1. Remove the metal carriage restraint marked with the florescent orange warning tag.
2. Remove the red rubber print head restraint.

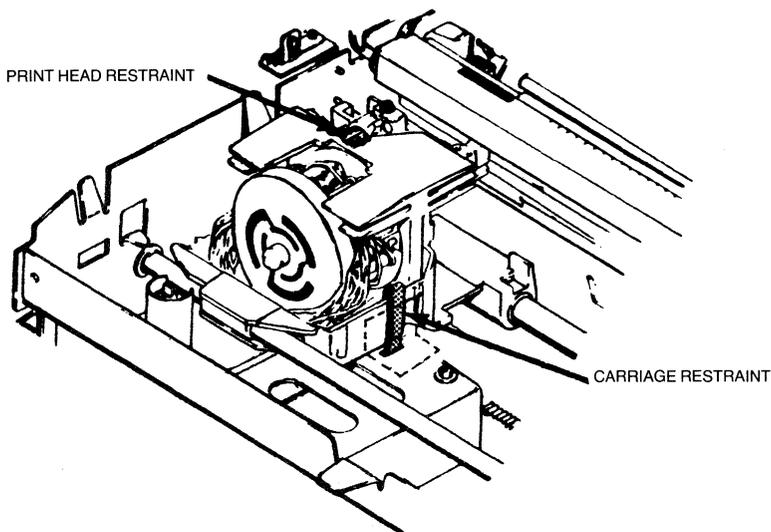


Figure 1-1

Next, Check for Damage

BEFORE YOU DO ANTHING ELSE, inspect your printer for shipping damage such as: dents, scratches, cracks, broken switches, and other broken parts. You should also listen for unusual rattling noises. If you find any damage, notify the delivery company immediately!

DO NOT operate a damaged printer. It may cause further damage and can void the warranty.

Do You Have the Right Equipment?

1. One standard three-prong grounded power outlet per printer.
2. One type RG 62A/U coaxial cable with type BNC UG260 B/U coaxial connector. The length should not exceed 1500 meters (4920 feet).
3. A table or print stand with enough room around it for ventilation, hookup of the coaxial cable, a user work area, and any additional equipment you may want.

Install Your Paper Guide Racks

The paper rack inlet.



Figure 1-2

1. Face the rear of your printer.
2. Pick up the inlet.
3. Insert the prongs into the mounting holes.
4. Make sure the inlet is at a 90 degree angle with the rear cover and does not tilt upward.

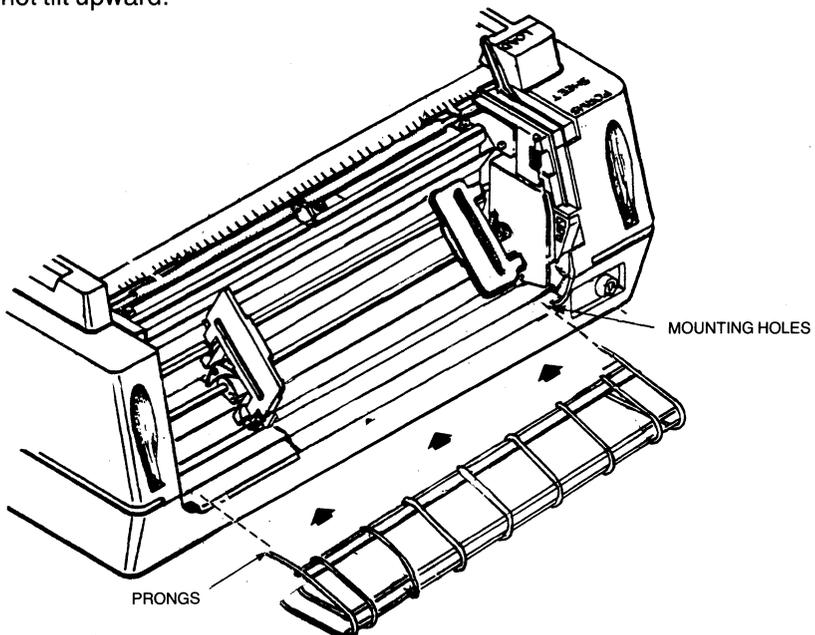


Figure 1-3 Attaching the Paper Rack Inlet.

The paper rack outlet.

Figure 1-4

1. You are still facing the back of your printer.
2. Pick up the outlet.
3. Remove the two nylon thumbnuts and save them.
4. Insert the two prongs of the outlet rack into the mounting holes on top of the rear cover.

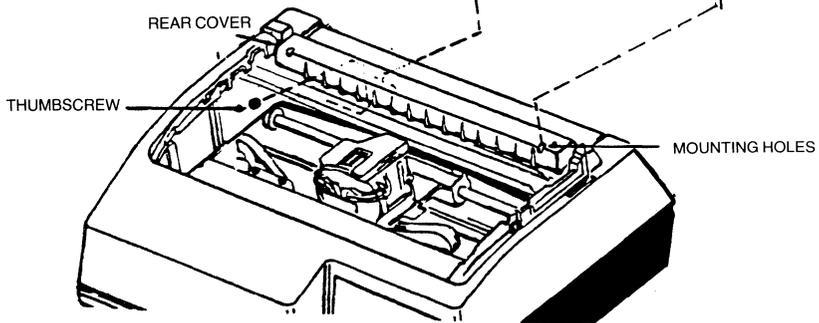


Figure 1-5 Attaching the Paper Rack Outlet.

5. Insert the other two threaded mounting prongs into the mounting holes in the middle of the rear cover.
6. Carefully open the rear cover and place the thumbnuts on the threaded part of the mounting arms. (See Figure 1-5.)
7. Close the rear cover.

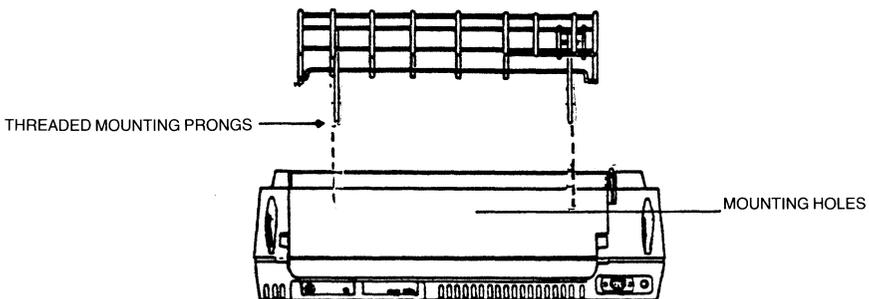


Figure 1-6

Load the Ribbon

Please use the ribbon cassette supplied by Interface Systems, Inc. or you may void the warranty.

To install the ribbon, refer to Figure 1-10 and do the following:

1. Lift the top cover up and off the printer.

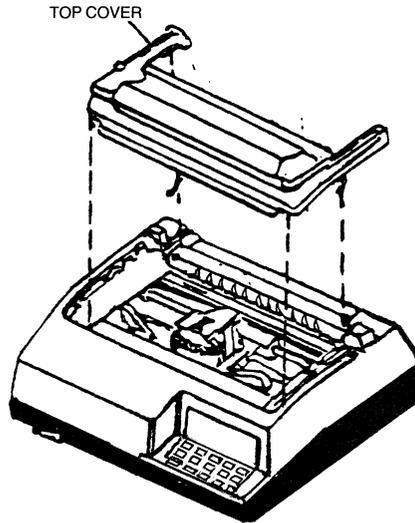


Figure 1-7

2. Unsnap the top part of the rear cover and let it hang open.
3. Find the print head and make sure it is at the far left margin. Your printer should not be on at this time, if it is turn it off.
4. Pull the forms lever to "LOAD."
5. Lift up the silver column scale.

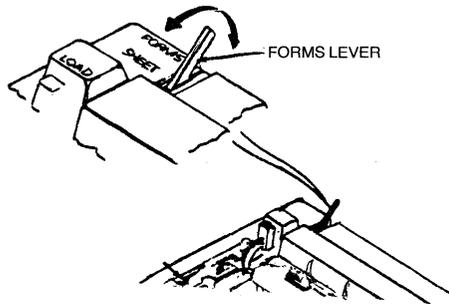


Figure 1-8

6. Note the position of the head adjustment lever. Once the new ribbon is in, the lever must be returned to this position.
7. Move the head adjustment lever towards the front of the printer as far as it will go, but don't force it.

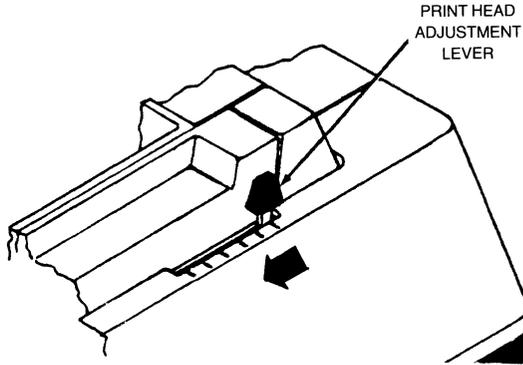


Figure 1-9

8. Snap the two left and two right retaining tabs of the ribbon into the four slots on the left and right side frames.
9. Squeeze together the two tabs at the top of the guide and push the guide downward onto the front of the print head.
10. Pull the cardboard ribbon tag off the top of the ribbon cassette.
11. Rotate the ribbon drive gear knob counter-clockwise several turns to make sure the ribbon is feeding right.

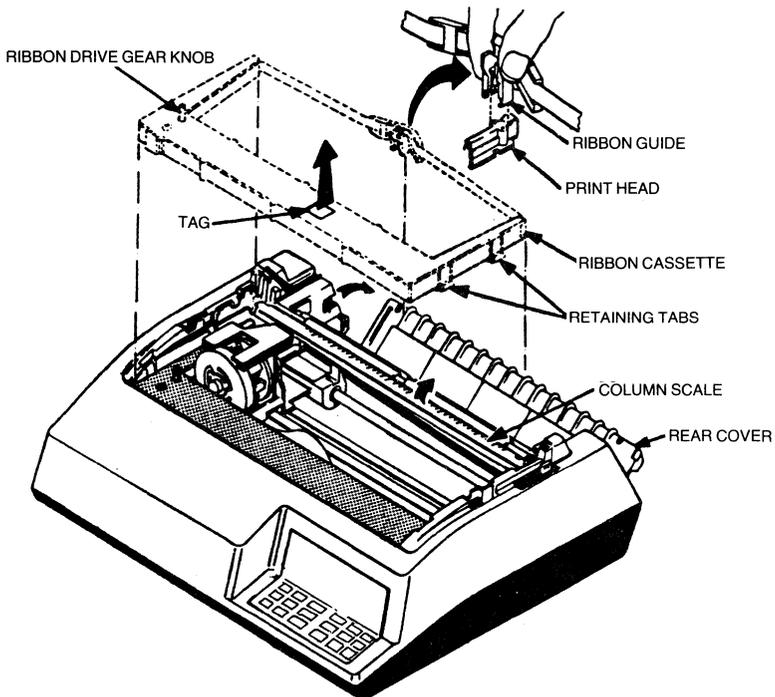


Figure 1-10 Installing the Ribbon Cassette and Guide

12. Place the column scale in the down position.
13. Move the forms lever to the type of forms you will be using ("FORMS" OR "SHEET").
14. Make sure the print head adjustment lever is in the same position it was before you started installing the ribbon.
15. Lift and snap the rear cover closed.
16. Insert the front lip of the top cover under the body cover and close the top cover.

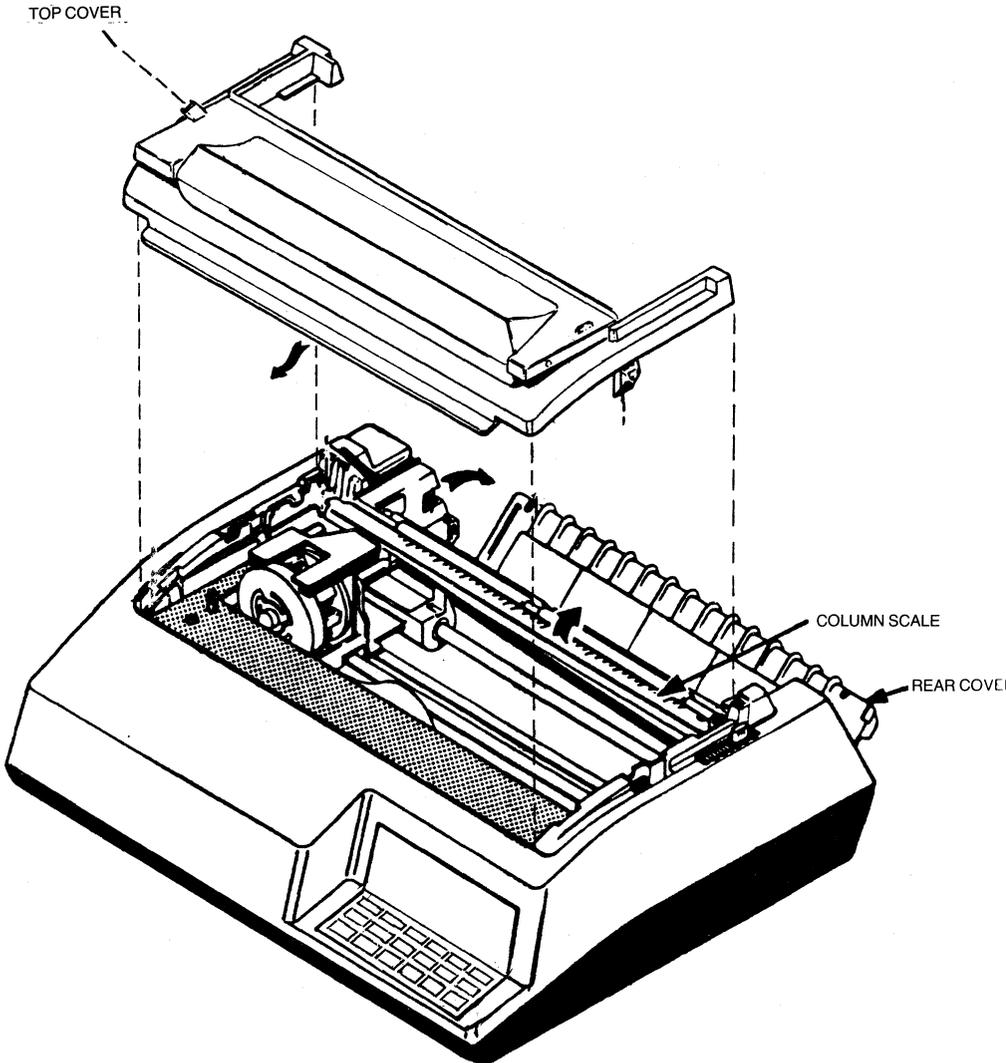


Figure 1-11 Replacing the Covers.

Turn the Power On and Test the Printer

You should power (turn) your printer on before you load your paper. Follow the steps below to power on your printer.

1. Make sure the forms lever is in “FORMS” or “SHEET.”
2. Plug the power cord into the power cord connector and into the power outlet.

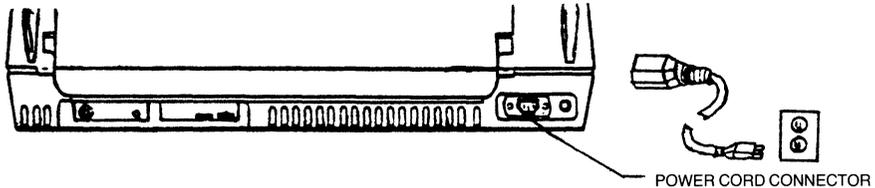


Figure 1-12 Connecting the Power Cord.

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

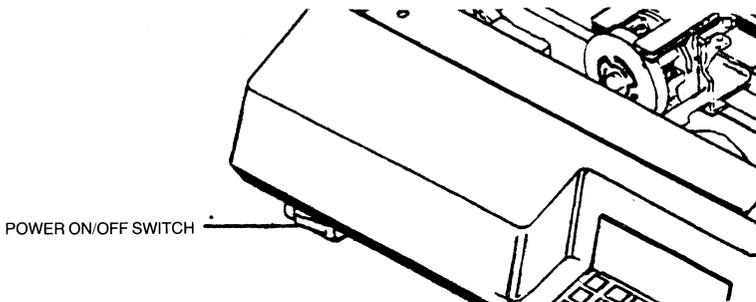


Figure 1-13 Turning the Printer ON.

After you power the 487 on, it will do this:

- The status indicator will first read “000.”
- The status indicator will then read “888.”
- All the lights on the operator control panel will come on and then go off.
- 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 tell you there is no paper loaded. Press HOLD to silence the alarm.

If no power goes on at all, check the power outlet you are using. If you are still having problems after you have consulted Section 2 — “WHAT TO DO IF YOU HAVE A PRINTER PROBLEM,” contact your service representative immediately or call our qualified service personnel at Interface Systems, Inc. the number is (313) 769-5900.

Connecting the 487 to a Controller

Since you are in the area, now is a good time to connect the 487 to a controller.

The 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 control unit. The connection is made by attaching a coaxial "Type A" interface from the control unit to the printer.

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

- IBM 3274 Controller
- IBM 3276 Controller
- IBM 4331 Processor
- Memorex 2076 or 2074
- Telex 274
- MDS/Trivex 8074

(See Diagram 1-A.)

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

1. Push the OFF end of the ON/OFF switch.
2. Bring the coaxial cable to your printer.
3. Locate the coaxial connector on the back of the printer as shown.
4. Push and lock (twisting clockwise) the cable connector into the printer.

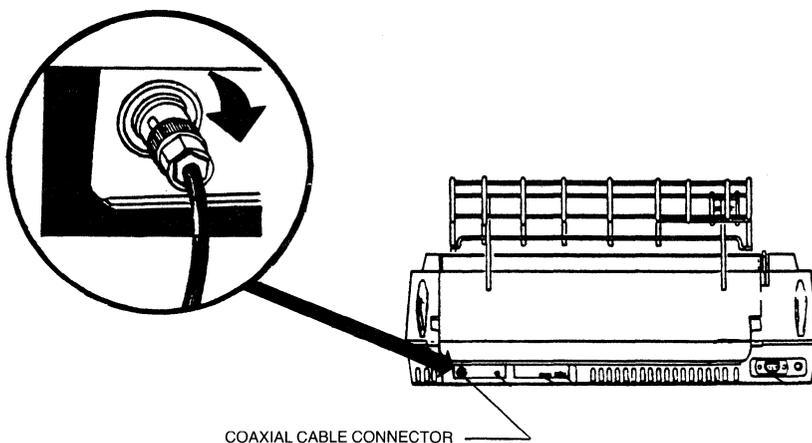


Figure 1-14 Connecting the Coaxial Cable.

DIRECT

REMOTE

LOCAL

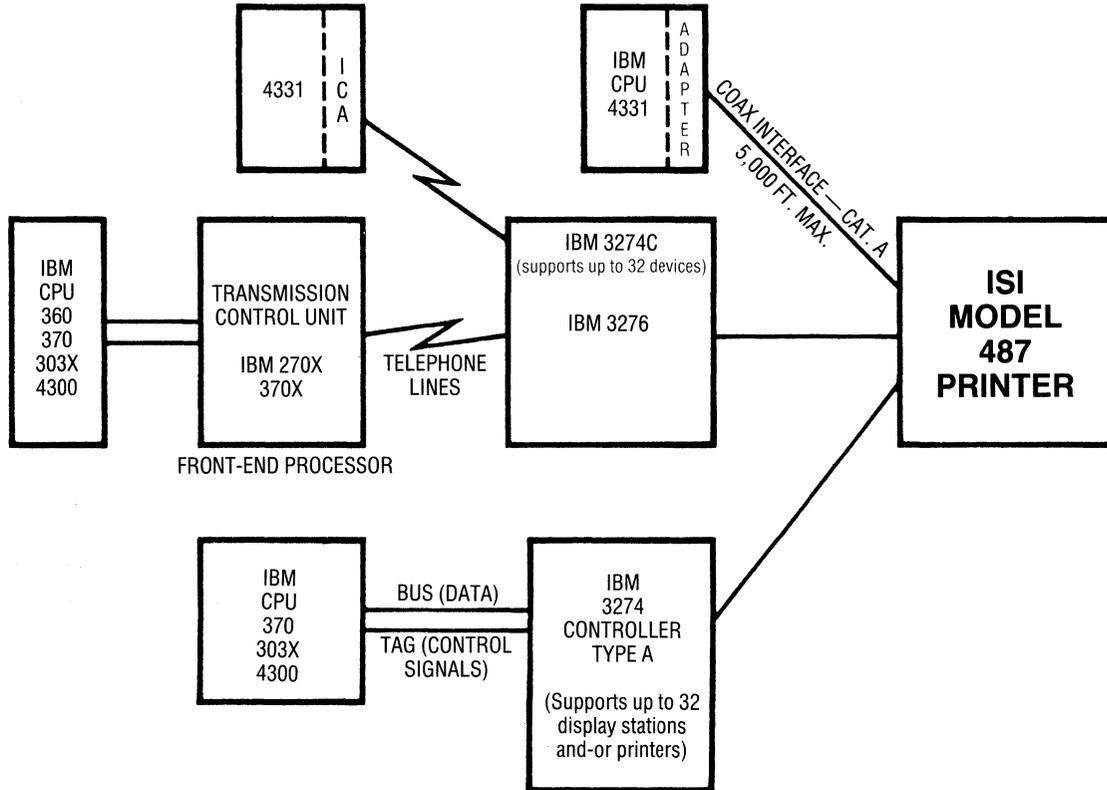


Diagram 1-A Configurations

Load the Paper

The 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.

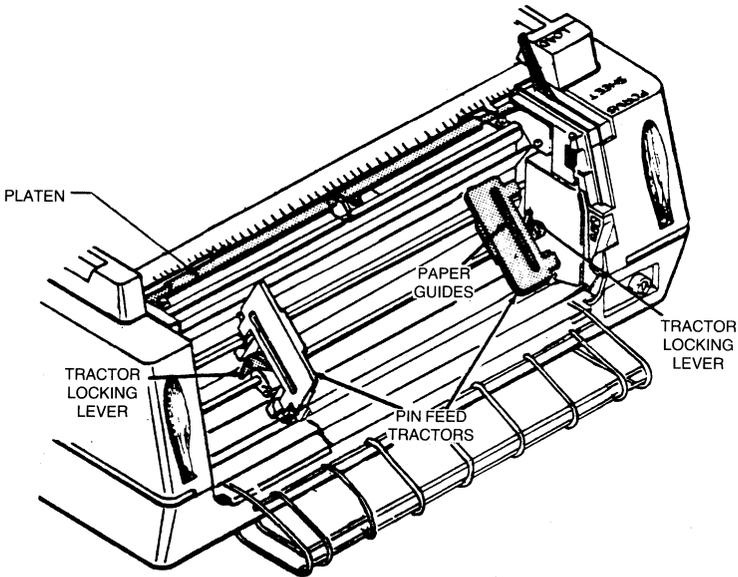


Figure 1-15 Loading Fanfold Forms.

Loading Fanfold Forms

Listed below are the steps for loading either single part or multi-part fanfold forms.

1. Push the Off end of the ON/OFF switch.
2. Unsnap and lift the rear cover from the printer.
3. Find the left and right pin feed tractors and open the left and right tractor paper guides.
4. Make sure the tractors are adjusted to the size of your forms. To adjust them, lift the left and right pin feed locking levers to loosen, and slide the tractors into place. When they are adjusted, tighten the locking levers.
5. Place your forms on the pin feed tractors. Make sure the paper is taut and the holes are centered on the pins or your paper may jam. (See Figure 1-16.)
6. Replace and close the rear cover.
7. Place the forms lever in "FORMS" position.
8. Make sure the top acrylic cover is closed.

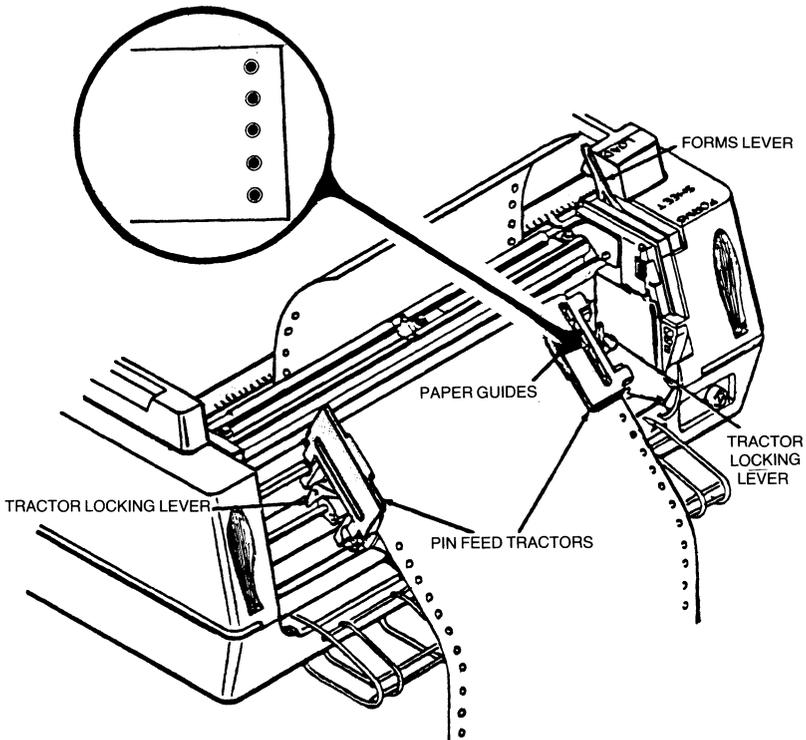


Figure 1-16 Centering Forms on Tractor Pins.

9. Push the ON end of the ON/OFF switch. The printhead will move to the first print position.
10. Wait until the READY indicator is lit and move the lever to "LOAD."
11. Press HOLD PRINT to keep the printing process from starting.
12. Depress the ↑ key for a few seconds to load paper into the printer.
13. Use the ↑ and ↓ key until the edge of the silver column scale/tear bar is directly under where you want the first line printed.
14. Press SECOND FUNCTION and FORM FEED. The printer will automatically align the printer to the starting position you have just selected.

The first form must be flush with or above the silver column/tear bar before the forms are fed or your paper will jam. Sometimes this requires you to advance to the second form for loading purposes.

15. Move the forms lever back to "FORMS."
16. Press ENABLE and the 487 is ready to print!

The forms alignment function is not active in cut sheet mode.

Loading Cut Sheets

The following steps tell how to load cut sheets into a 487 that is in fanfold forms mode and out of paper when powered on. If there are fanfold forms left in the printer remove them before you load the single cut sheets.

1. Press HOLD to interrupt the printing process.
2. Press CHG MODE to enter the cut sheet mode of paper handling. The CUT SHEET indicator will light.
3. You may want to adjust forms length or maximum presentation position. If you do you will have to look in Section 2 — "Second Function Keys, SET FL." When the 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.
4. You may also want to adjust spacing and LPI as required for your printing job if it is different than the default settings listed on page 30. See Section 2 — "Primary Function Keys, CHG LPI and CHG SPACE" for instructions.

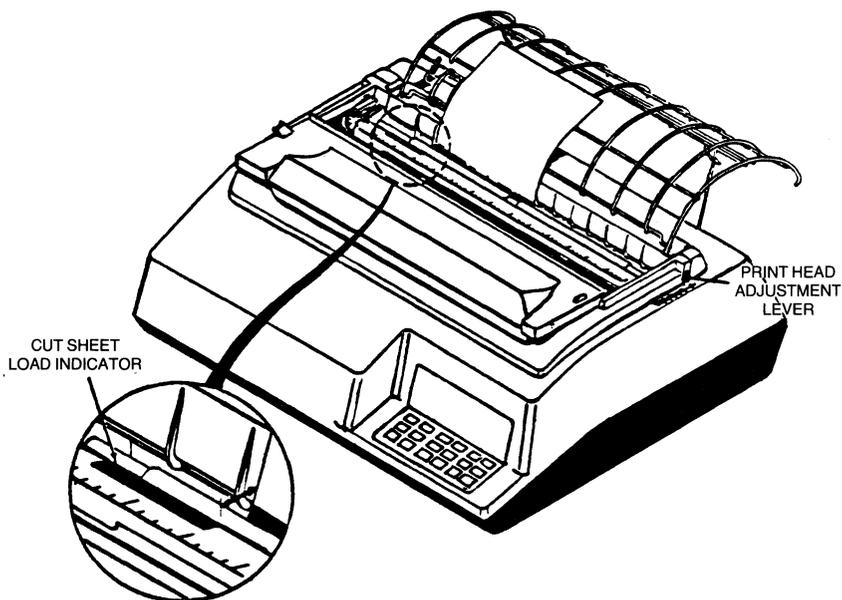


Figure 1-17 Loading Cut Sheets.

5. Move the forms lever to "LOAD."
6. Insert a cut sheet into the printer. Make sure the left edge of the sheet is aligned with the right edge of the red cut sheet indicator.
7. Move the forms lever to "SHEET."

Left tractor must be set to the extreme left when using cut sheet forms.

8. First press 2ND FUNC, then F1. The printer will automatically load the sheet for printing.
9. Press ENABLE. Your 487 is ready to print.

How to Operate Your Printer

There are a number of keys and switches on the back and front panel that allow you to control the printing process.

The Front Panel

The keys you will use the most are: HOLD, and ENABLE.

To stop printing press HOLD

To start printing again press ENABLE

Other keys that are helpful are: FORM FEED, ↑ (advance forms key), and ↓ (reverse forms key), INDEX.

To advance the paper one line press HOLD and INDEX.

To advance the paper to the top of the forms when using fanfold paper, press HOLD and FORM FEED. For cut sheets it will advance the paper for removal.

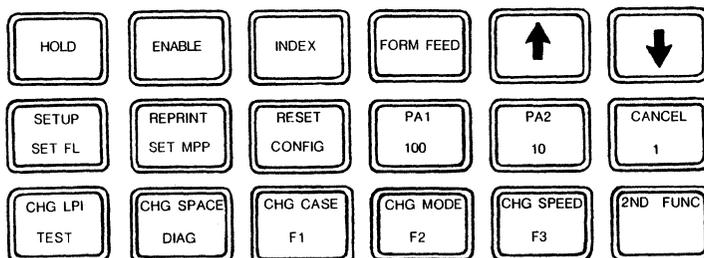


Figure 1-18 The Front Panel

To advance the paper in small increments press HOLD and ↑.

To advance it continuously, hold ↑ down.

To move the paper backward in small increments press HOLD and ↓.

To move it continuously backward hold ↓ down.

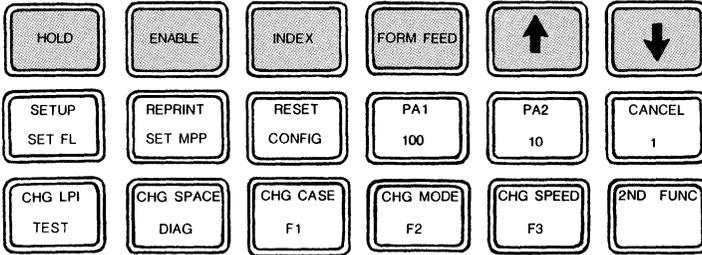


Figure 1-19 The Most Used Keys

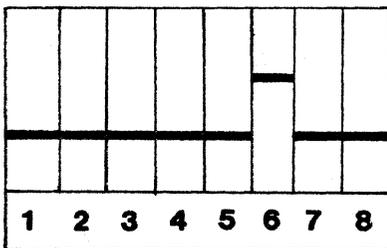
When your printer is powered on, it is already set to do certain things. These things are:

- Print in upper and lower case.
- Print with single spacing between lines.
- Print six lines per inch.
- Print 132 characters per line.
- Print 66 lines per page (for standard 11 inch form).
- Print on continuous fanfold forms.

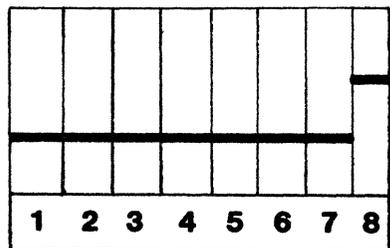
If you want to change any of these settings, or want to learn more about these keys and others, turn to Section 2 — “OPERATIONS YOU CAN CONTROL.”

The Back Panel

There are two switch packs, E60 and E81, on the rear of your printer. E60 switches control model and language selection and E81 switches provide access to special printing functions. These switches, like the front panel keys, are also already at specific settings to select certain things.



E60



E81

Figure 1-20 Back Panel Switch Packs E60 and E81.

These settings are:

SWITCH	SETTING	FUNCTION
E60		
1-5	Down	Language — English U.S.
6	Up	4K Buffer
7, 8	Down	4K Buffer
E81		
1-7	Down	Selects “standard” settings (listed in Section 2 — “Default Settings”) at power up. Will not print null lines.*
8	Up	Print forms feed on local copy.**

To change these settings or learn more about them, see Section 2 — “USER SELECTABLE FEATURES.”

Table I-I

*Null lines: Will not print null lines — if a print line has no printable characters, a New Line will not be performed. The first print position of the current line is the next print position.

Print null lines: all null lines will be printed as a blank line and a New Line will be performed. The first print position of the next line is the next print position.

**Form feed on local copy: an automatic form feed is performed immediately after a print order. The first print position of the first line on the next form is the next print position.

Check These Things Before You Start Printing

You are almost ready to start printing, but first go over this list of questions before you start to print to make sure you haven’t forgotten to do something.

- | | YES | NO |
|---|--------------------------|--------------------------|
| 1. Is the printer power cord plugged securely into a well grounded power outlet? (pg. 11) | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Is the coaxial cable securely connected to the printer? (pg. 12) | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Is a good ribbon cassette installed? (pg. 8) | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Is the paper or continuous form loaded properly? (pgs. 14-16) | <input type="checkbox"/> | <input type="checkbox"/> |

5. Do you have enough paper?
6. Are the front, rear, and acrylic covers closed?
7. Is the POWER ON/OFF switch ON? (pg. 11)

If you answered no to any one of the questions, go back to the section that has the instructions you need and follow them carefully. If you answered yes to all the questions, you're all set. So go ahead and send it a print.

What to Do If You Have a Printer Problem

First, refer to Section 2 — “WHAT TO DO IF YOU HAVE A PRINTER PROBLEM,” for details. Then, if you are still having problems call our qualified service personnel at Interface Systems, Inc. The number is (313) 769-5900.

To use your printer to its fullest potential, please continue on to Section 2. **We don't want you to miss a thing!**

Section 2

THE DETAILED VERSION

. . . designed to tell you everything you want to know about your 487 printer

Table of Contents

SUMMARY OF PRINTER PARTS	23
Standard Features	23
FEATURES YOU CAN CONTROL	23
WHAT TO DO WHEN YOU NEED A NEW RIBBON	25
WHAT TO DO WHEN YOU RUN OUT OF PAPER	27
Reloading Fanfold Forms	27
Reloading Cut Sheets	28
Adjusting For Forms Thickness	29
OPERATIONS YOU CAN CONTROL	29
Default Settings	30
Primary Function Keys	31
HOLD	31
ENABLE	31
INDEX	31
FORM FEED	31
↑	32
↓	32
SETUP	32
REPRINT	32
RESET	32
PA1 and PA2 (Program Attention)	33
CANCEL	33
CHG LPI (CHANGE Lines Per Inch)	33
CHG SPACE (CHANGE SPACE)	33
CHG CASE (CHANGE CASE)	34
CHG MODE (CHANGE MODE)	35
CHG SPEED (CHANGE SPEED)	35
2ND FUNC	35

Second Function Keys	35
SET FL (FORMS LENGTH)	36
Forms Length Setting Example	36
SET MPP (MAXIMUM PRESENTATION POSITION)	37
CONFIG (CONFIGURE)	37
100, 10, and 1	39
TEST	39
DIAG (DIAGNOSE)	39
F1 (FUNCTION)	40
F2 (FUNCTION)	40
F3 (FUNCTION)	40
WHAT THE LIGHTS MEAN	40
READY	41
HOLD PRINT	41
TEST	41
CHECK	41
CU SIGNAL	42
DOUBLE	42
DUAL CASE	42
8 LPI	42
CUT SHEET	42
NLQ	42
FUNCTION	42
USER SELECTABLE FEATURES	42
Language Select Switch Settings	43
IBM Model Select Switches	45
Special Function Switch Settings	45
MISCELLANEOUS ITEMS	46
Status Indicator	46
Audible Alarm	46
CU Light	46
WHAT TO DO IF YOU HAVE A PRINTER PROBLEM	46
Operational Status Codes	47
Running a Self-Test	49

Section 2

THE DETAILED VERSION

Summary of Printer Parts

Now that you are familiar with all the set up procedures and basic controls you are ready to learn “the other stuff,” and do a little experimenting with the other keys and switches. First of all we would like to tell you a little about your printer.

The ISI 487 is a compact desk-top printer that can be used in place of 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 4331, Memorex 2076 or 2074, Telex 274 and the MDS/Trivex.

Standard Features

The standard features listed below give you an idea of what your printer can do.

- 200 characters per second (CPS) dot matrix printing at 10 characters per inch (CPI) and 50 CPS near letter quality (NLQ) printing at 10 CPI.
- 190 CPS dot matrix printing at 16.67 CPI compressed print.
- Continuous forms handling and single cut “letterhead” sheets handling.
- Demand document feature allows printing within 1” top of form (TOF).
- Operator-programmable memory
- 6 part forms handling capability
- IBM 3287 international character set
- Extended print buffer for local copy support of IBM 3278 Models 3-5.
- Status indicator displays three digit, easy to remember codes for monitoring the current format settings, error codes, and selected test numbers.
- Operational in SCS or non-SCS mode. SCS mode is indicated by the READY light flashing while the printer is in HOLD.

Features You Can Control

This is a description of the standard features that allow you to control the printing process and to set and change various format parameters. Format parameters are the different features which determine the way your documents are printed. Below are the many printer functions you can control through the switch packs on the rear of the printer or the keys on the control panel. Details on how to use all the control features described below are in “OPERATIONS YOU CAN CONTROL.”

Forms Length
(Lines per page)

When you turn the printer on it is automatically set to 66 lines per page. This is standard for 11 inch paper at 6 lines per vertical inch. You can select a three digit page length of 001 to 102 lines. Refer to the SET FL key description for details.

Maximum Presentation Position
(Line Length)

The line length is currently set at 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 key description for details.

Lines Per Inch

The printer is automatically set at 6 lines per inch (LPI), single spaced. You can choose 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 (select 8 lines per inch double spaced). Refer to the CHG LPI and CHG SPACE key descriptions for details.

Form Feed and Index

While the printer is in HOLD, you can advance the paper to the next top of form by using the FORM FEED key. You can also set the printer to perform a form feed after an operator initiated copy. You can advance the form by one line, using the INDEX key. See FORM FEED and INDEX keys for details.

Stop/Start Printing

You can stop printing in process with the HOLD key and restart it with the ENABLE key. See HOLD and ENABLE.

Forms Alignment

While the printer is in HOLD, you can move the paper up or down using the ↑ or ↓ key. This makes it easy to align preprinted forms, as described later.

Printing Speed
(Print Quality)

You can determine the print quality of the 468 with the CHG SPEED key. The 487 can deliver 200 CPS dot matrix printing, 50 CPS near letter quality printing, or 16.67 CPI compressed print.

Printing Mode
(Type of Forms)

You can determine the print quality of the 487 with the CHG MODE key. Press the key and the 487 will be ready to handle either single cut sheets or continuous forms. The current setting is for continuous forms.

- Language Select** From a variety of international character sets, you can select the language set your printer will print in. Switch pack E60, located in the rear of the printer housing makes this selection possible. Refer to the "USER SELECTABLE SWITCHES" section for details on specific settings.
- 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 the "USER SELECTABLE SWITCHES."
- Null Line Print** You can select null line print to print lines consisting entirely of null characters. Refer to "SPECIAL FUNCTION SETTINGS" for details.
- 16.67 CPI Compressed Print** You can select 16.67 characters per inch printing. Refer to "SPECIAL FUNCTION SETTINGS" for details.

What to Do When You Need a New Ribbon

After you have had your printer for a while you will inevitably have to change the ribbon. Please only use the ribbon cassette supplied by Interface Systems, Inc. Though other manufacturers offer "similar" ribbons, they are not recommended and may cause serious problems.

If your printer is printing when you need to change the ribbon, press HOLD to interrupt the printing. If printing is not in progress, press the OFF end of the POWER ON/OFF switch.

To remove the ribbon cassette, follow this procedure:

1. Lift the top cover up and off.
2. Unsnap the top part of the rear cover and let it hang open.
3. Find the print head and make sure it is at the extreme left margin.
4. Place the forms lever in "LOAD," and raise the silver column/tear bar.
5. But wait!

Before doing step 6, note the position of the head adjustment lever. Once the new ribbon cassette is installed, the lever must be returned to this position.

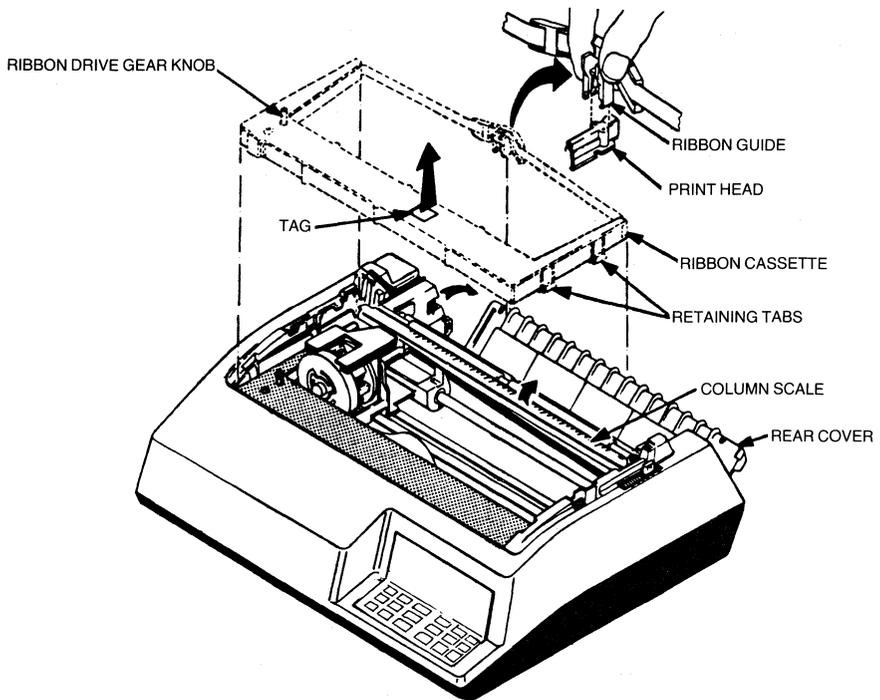


Figure 2-1 Reloading the Ribbon Cassette and Guide.

6. Now, move the head adjustment lever towards the front of the printer as far as it will go, but don't force it.
7. Squeeze together the two tabs at the top of the ribbon guide and lift the used ribbon cassette and attached ribbon guide up and out of the printer.
8. 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.
9. Install the new ribbon guide by squeezing the two tabs at the top of the guide together, and pushing the guide downward onto the front of the print head.
10. Pull the cardboard ribbon tag off the top of the ribbon cassette.
11. Rotate the ribbon drive gear knob counter-clockwise several turns to make sure the ribbon is feeding properly.
12. Place the column in the down position and move the forms lever to the type of forms ("SHEET" or "FORMS") you will be using. Make sure the print head adjustment lever is in the same position as before you put the new ribbon in.
13. Lift and snap the rear cover closed.
14. Put the front lip of the top cover under the body cover and close the top cover.
15. Press ENABLE to resume printing and you are on your way.

What to Do When You Run Out of Paper

You are out of paper when:

1. Printing stops.
2. The CHECK indicator lights up.
3. The audible alarm sounds.
4. The status indicator displays a “1.”

Reloading Fanfold Forms

The 487 prints until the last fanfold form passes through the paper empty switch on the left pin feed tractor. To reload fanfold forms, do the following:

1. Press HOLD.

Whenever the printer runs out of paper while printing, press HOLD to interrupt printing and ensure that the printer does not start printing while you are loading the paper.

2. Move the forms lever to “LOAD.”

Before doing step 3, note the position of the head adjustment lever. If loading the same forms as before, you must return the lever to this position once the forms are loaded.

3. Pull the head adjustment lever toward the front of the printer as far as it will go without forcing it.
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 key for a few seconds to load paper into the printer.
9. Use the ↑ key and the ↓ key until the edge of the silver column scale/tear bar is directly under where you want the first line printed.

The first form must be flush with or above the silver column/tear bar before the forms are fed or your paper will jam. Sometimes this requires you to advance to the second form for loading purposes.

10. Press **SECOND FUNCTION** and **FORM FEED**. The printer will automatically align the printer to the starting position you have just selected.
11. Now, return the print head adjustment lever to its original position. If a different forms thickness is needed, follow the print head impression adjustment described in "Adjusting For Forms Thickness."
12. Press **ENABLE** and you may start printing again.

Reloading Cut Sheets

When the last line has been printed on the current sheet, the alarm will sound and the LED (light emitting diode) status indicator, will display a "1." Follow the procedure below to remove the paper:

1. Press **HOLD**. Be sure the printhead is at the extreme left. If it is not there, press the ↑ arrow key.
2. Move the forms lever to "LOAD" and manually remove the sheet from the printer.

If the printing does not reach the bottom of the sheet, follow these steps:

1. Press **HOLD**.
2. Press **FORM FEED** or ↑ to advance the paper.
3. Move the forms lever to "LOAD" and manually remove the sheet from the printer.

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

1. Stay in **HOLD** making sure the **HOLD** indicator is lit.
2. Move the forms lever to "LOAD."
3. Insert a cut sheet into the printer until it rests on the stop. Make sure the left edge of the sheet is aligned with the right edge of the red cut sheet indicator.
4. Move the forms lever to "SHEET."

Left tractor must be set to the extreme left when using cut sheet forms.

5. First press 2ND FUNC, the F1. The printer will automatically load the sheet for printing.
6. Press ENABLE. Your 487 is ready to print.

Adjusting For Forms Thickness

The print head can be adjusted in or out for different form thickness to provide optimum print quality. If your 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. Pull the head adjustment lever toward the front of the printer.
3. While manually moving the print head from side to side, push the head adjustment lever toward the back of the printer (see Figure 2-1) until smudging or paper rippling occurs, then pull the head adjustment lever toward the front, one position.
4. Perform a self-test while the printer is in HOLD. (See "Running a Self Test" for details.)
5. Check the printout to ensure crisp, clear print quality. If the print is too dark or too light adjust the print head in or out as required.

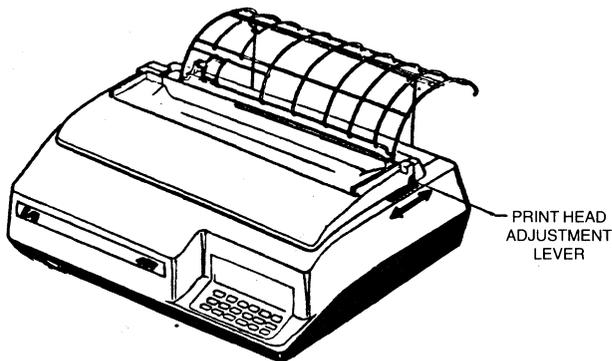


Figure 2-2 Print Head Adjustment.

Operations You Can Control

THE FRONT PANEL

The keys that you'll use to control the operation of the 487 are located on the operator control panel on the front of the printer. You will find the keys which control movement on the top row. In the next two rows you will find the primary function keys (in white) and the secondary function keys (in red). These keys let you set printing specifications such as forms handling and print quality, format parameters such as forms length and maximum presentation position, or directing the printer to run certain tests.

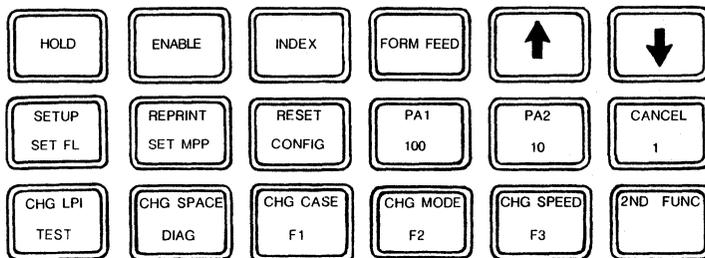


Figure 2-3 Front Panel Keys.

Default Settings

When the printer is powered on, there are certain format parameters already set in your printer that will be used automatically if you don't make any changes, these are called default settings. You can change them temporarily for your specific job by setting the desired keys on the operator panel. You can even change the default settings permanently by using the CONFIG key (see the individual description on the CONFIG key). If you do not change the default settings, the following settings will be in effect:

DEFAULT SETTINGS	MEANING
Mono Case	Prints in uppercase only. Mono is the default setting, but it has been reset with the CONFIG key so it will print in Dual Case when you receive it.
Single Space	Prints with single spacing between lines.
6 LPI	Prints six lines per inch.
Forms Length	Prints 66 lines per page (11 inch forms.)
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.

Table 2-1

Primary Function Keys

Most of the time, your printer is in the primary function mode. In primary function mode, the default mode of your printer, you can use the primary function keys. This section describes where each key is, what it does, and how to use it.

All of the keys on the control panel (except HOLD) can only be set when the printer is not printing. This means the HOLD key must be pressed before using any other key.

The following six keys control movement.

Hold

Press HOLD to stop printing.

- The HOLD PRINT light comes on.
- The READY light flashes in SCS mode and goes out in non-SCS mode.

To resume printing, press ENABLE.

Enable

Press ENABLE to continue normal printing.

- The HOLD PRINT light goes out.
- The READY light is on.

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

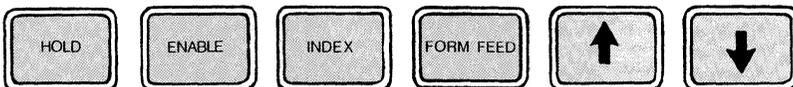


Figure 2-4 Top Row Primary Function Keys.

Index

Press INDEX while in HOLD to advance the paper one line.

Form Feed

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

↑ (advance forms key)

Press the ↑ key while in HOLD to advance the fanfold paper in increments of 1/120th of an inch and cut sheet paper in increments of 1/108th of an inch.

To feed paper continuously, press the key for more than 1/2 second. The paper moves forward until the key is released.

↓ (reverse forms key)

Press the ↓ key while in HOLD to move the fanfold paper backwards in increments of 1/120th of an inch and cut sheet paper in increments of 1/108th of an inch.

To feed paper continuously, press the ↓ key for more than 1/2 second and paper moves continuously backward until the key is released.

Setup

Press SETUP while in HOLD.

- 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 form. (Only one "H" will be printed at a time; not a whole line).

This feature is useful for viewing the current MPP and forms alignment.

Reprint

Press REPRINT while in HOLD to print the contents of the print buffer. The print buffer is a temporary storage place for information while it is being switched from one place to another.

This feature is useful if the printer runs out of paper while printing. If the printer has finished the current job, however, the buffer reprint will not work. If the printer can execute the command, the contents of the buffer is printed from the beginning, after ENABLE is pressed. REPRINT must be selected before selecting ENABLE after printing has been interrupted, otherwise, data in the print buffer may be lost.

REPRINT is not always active in SCS mode.

Reset

This key is used to reset the error indication in the numeric display. When the reset is accepted, the form will advance one line.

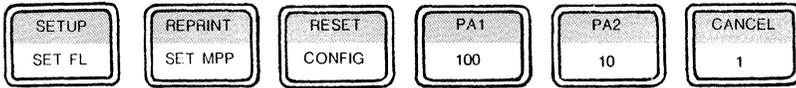


Figure 2-5 Second Row Primary Function Keys.

PA1 and PA2 (Program Attention)

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

Cancel

You can only use this key if SCS (SNA Character String) is operational on your printer. If the printer is in SCS mode, press CANCEL while in HOLD. Printing will stop, a "59" will display, and all unprinted data will be lost. "59" will be displayed until a more important message must be displayed, or until the printer receives an appropriate SCS print (First In Chain), whichever comes first.

CHG LPI (Change Lines Per Inch)

Pressing CHG LPI while in HOLD determines the number of lines per inch to print, 6 or 8. The current status of this key is indicated by the 8 LPI light. 6 LPI is the default setting at power up.

Press HOLD, 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.

When changing LPI, it 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 3 lines per inch.

CHG Space (Change Space)

Pressing CHG SPACE while in HOLD determines whether the spacing between lines will be single or double. The current status of this switch is defined by the DOUBLE indicator. Single spacing is the default setting at power up.

Press HOLD, then press CHG SPACE.

- The DOUBLE light is on.
- The printer will print with double spacing.

Press CHG SPACE again.

- The DOUBLE light goes out.
- The printer will return to single spacing.

When changing SPACE, it is assumed that you are at T0F.

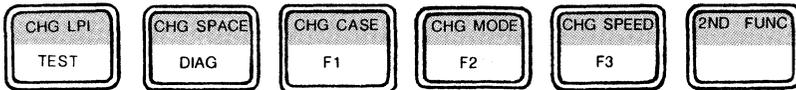


Figure 2-6 Third Row Primary Function Keys.

CHG Case (Change Case)

In non-SCS mode while in HOLD, this tells the printer which case to print letters in. The current status of this key is defined by the DUAL CASE indicator. Mono case is the default setting at power-on: letters are printed in upper case only.

Press HOLD, then press CHG CASE.

- The DUAL CASE light comes on.
- The printer will print letters in upper and lower case.

Press CHG CASE again.

- The DUAL CASE light goes out.
- The printer will return to Mono Case printing.

In SCS mode, the printer operates only in Dual Case. Mono Case setting will be overridden. Also, some optional languages operate correctly only when in DUAL CASE, see "Language Select Switch Settings."

CHG Mode (Change Mode)

Pressing this key while in HOLD 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 HOLD, then press CHG MODE.

- The CUT SHEET light comes on.
- The 487 is now ready to handle single cut sheet paper.

Press the CHG MODE key again.

- The CUT SHEET light goes out.
- The ISI 487 returns to fanfold forms mode.

CHG Speed (Change Speed)

Pressing CHG SPEED while in HOLD determines the print quality of the 487. The current status of this switch is defined by the NLQ (near letter quality) light. 200 CPS dot matrix printing is the default setting at power on.

Press HOLD, then press CHG SPEED.

- The NLQ light will come on.
- The 487 will print 50 CPS near letter quality print.

Press CHG SPEED again.

- The NLQ light will go out.
- The 487 will return to dot matrix printing.

2nd Func

Pressing this key while in HOLD activates the function printed in red on the keys (lower portion of the keypad), thus placing the printer in Second Function mode. When this switch is pressed, the HOLD light will begin flashing and “ccc” will appear in the Status Indicator. To fully understand how the Second Function keys work, see the following section.

Second Function Keys

The Second Function keys 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 key descriptions below carefully follow the procedures in the order they are given.

If any key 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.

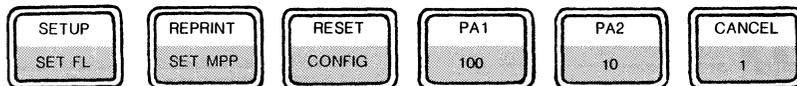


Figure 2-7 Second Row Second Function Keys.

Set FL (Forms Length)

The default setting for forms length is 66 lines. To see the current setting:

- Press HOLD, then press 2ND FUNC.
- Then press SET FL.

The LED status indicator displays the current lines per page as a three digit number (066 for 66 lines per page).

Now, you can select a new forms length in the range of 0 to 102.

- Press the 1, 10, and/or 100 keys.
- Then press SET FL to tell the printer to begin using this new forms length. (Or, you may return to primary mode without altering the length, by pressing 2ND FUNC.)

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.

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 x 6 lines per inch = 66 the total lines per page. This is the default forms length setting. In this example, we'll assume that the paper form length is 11 inches (279.4 mm) and that you want 8 lines per inch, single spaced:

- First press HOLD.
- You want to print 8 LPI, but your printer is in the 6 LPI default setting. To set the printer at 8 LPI simply press CHG LPI (the 8 LPI indicator should light) and your printer will print 8 lines per inch.

- Now, you want single spacing, which is the default setting for the printer. Multiply the paper length by 8 for single spacing ($11 \times 8 = 88$). (For double spacing, set the CHG SPACE key and multiply the paper length by 4 ($11 \times 4 = 44$).
- Put the printer in second function mode. (You should still be in HOLD, so just press 2ND FUNC.)
- Then press SET FL.
- Now enter the page length value as a three digit number by using the 1, 10, and/or 100 keys. Your entry (088) will be displayed in the LED status indicator.
- Press SET FL 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 your forms length permanently, see "Secondary Function Keys, CONFIG."

Set MPP (Maximum Presentation Position)

The default setting for maximum presentation position is 132 characters at power on. To view the current setting:

1. Place the printer in second function mode (by pressing HOLD, then 2ND FUNC).
2. Then press SET MPP. The LED status indicator displays the current characters per line as a three 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.

1. To select a new MPP use the 1, 10, and 100 keys. You can check your work by viewing the new parameters in the LED status indicator.
2. Press SET MPP again, and your 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. To set this value permanently, see the following section.

Config (Configure)

While in the second function mode, CONFIG allows you to set chosen parameters permanently. Values set permanently will stay in the printer's memory and are ready for use at power on.

CONFIG is to be used in specialized applications only. It is not recommended for printers used for a variety of printing functions.

Primary function mode parameters such as LPI, print spacing, character case, print type, and paper handling are set temporarily as explained under each key 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 HOLD.
2. While in primary function mode, select the desired parameters. You may use primary function keys: CHG LPI, CHG SPACE, CHG CASE, CHG SPEED, or CHG MODE. See the definition of each key you are interested in setting under "Primary Function Keys."
3. Press 2ND FUNC. (Notice that the LED display shows "ccc.")
4. Press CONFIG.

To permanently set the printer at 8 LPI, first press HOLD, then press CHG LPI so that the 8 LPI light is on. Next, press 2ND FUNC and finally, CONFIG.

The CONFIG key also allows you to set second function mode parameters permanently. To set these features permanently, follow the procedures below:

1. Place the printer in HOLD.
2. Press 2ND FUNC and select the desired parameters. The second function keys you may use are: SET FL, SET MPP, or F2.
3. Press CONFIG.

To set the forms length permanently, first press HOLD, then press 2ND FUNC. Next press SET FL and increment to desired forms length. Press SET FL to register the new forms length in the printer. Then press 2ND FUNC and finally CONFIG.

100, 10, and 1

The number 100, 10, and 1 keys are used to change page length, line length, and to select a diagnostic test number. If you are using the 3-bin sheet feeder option, the 1 key is used to select specific bins. The number you enter to indicate a new page length, line length, test, or bin number is displayed on the status indicator. For complete instructions on how to use these keys, refer to "SET FORMS," "SET MPP," "DIAGNOSE" and "F3."

Test

While in second function mode, the TEST key is pressed to perform a self-test.

- The printer will perform the requested test.
- The TEST light comes on.

For detailed instructions on the self-test procedure, see "Running a Self-Test." To change the current test number, follow the procedure outlined in the DIAG key description.

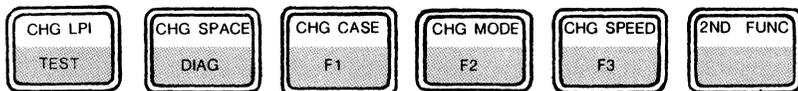


Figure 2-8 Third Row Second Function Keys.

Diag (Diagnose)

While in second function mode, the DIAG key allows you to select a test you wish the printer to run when TEST is pressed. The default setting for the test number is 0. To view the current setting:

1. Place the printer in second function mode (by pressing HOLD, then 2ND FUNC).
2. Then press the DIAG key. The LED status indicator displays the current test number as a three digit number (003 for test #3).

To select your new test number:

1. Press the "1" key.

See "Running a Self-Test" for a list of the available self-tests and their corresponding numbers. The LED status indicator will display your selection.

To return to primary function mode:

1. Press DIAG again.
2. The printer is now 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.

The DIAG setting cannot be set permanently.

F1 (Function)

While in second function mode, the F1 key is used to assist the printer in cut sheet paper insertion. When the F1 key is pressed, the printer will automatically load the sheet currently inserted for printing. The F1 key should only be pressed at the point indicated in Section 1 — “LOAD THE PAPER” as part of the loading process.

F2 (Function)

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 487 will print 16.67 CPI.

To set 16.67 permanently, see “Secondary Function Keys, CONFIG.”

F3 (Function)

Press F3 while in second function mode (cut sheet feeder attached) to select the different bins of the cut sheet feeder. See pg. 75 for details.

What the Lights Mean

The lights on the operator control panel light to indicate what printer functions are being used. The paragraphs below describe each light and Figure 2-9 shows where they are on the panel.

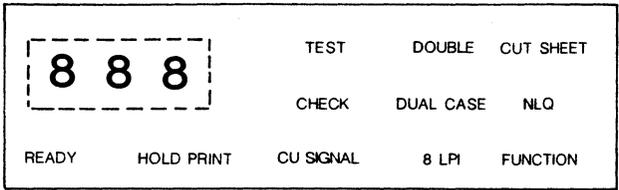


Figure 2-9 Status Indicator Lights.

Ready

READY is on when:

- The printer is ready to receive data from the controller.

READY is off when:

- The printer enters HOLD.
- The printer enters test mode.
- The check condition occurs (error detected).
- The printer is powered off.
- The printer runs out of paper.

READY flashes when:

- The printer is in HOLD (this indicates the printer is operating in SCS mode).

Hold Print

HOLD is on when:

- The printer is in the hold print mode.

HOLD flashes when:

- The printer is in second function mode.

Test

TEST is on when:

- The self-test or a selected diagnostic test is being run.

TEST is off when:

- The printer completes the self-test or a selected diagnostic test.
- The HOLD key is pressed.

The TEST light does not come on during test #8. HOLD will stop the test, but it will not make the light go on.

Check

CHECK is on when:

- An error condition occurs.

The printer will stop printing and the status indicator displays an error code (see “Operational Status Codes” to determine the meaning of the error codes).

CU Signal

CU SIGNAL comes on when:

- The printer is in communication with the controller.

CU SIGNAL is off when:

- Signals from the controller are not received approximately every 40 seconds, the light goes out after three time-outs.

Double

DOUBLE is on when:

- The printer is set to insert one blank line between printed lines.

Dual Case

DUAL CASE is on when:

- The printer is set to print in upper and lower case.

8 LPI

8 LPI is on when:

- The printer is set to print 8 lines per vertical inch.

Cut Sheet

CUT SHEET is on when:

- The printer is set to handle single cut sheets of paper.

NLQ

NLQ is on when:

- The printer is set to print 50 CPS near letter quality printing at 10 CPI.

Function

FUNCTION is on when:

- The printer is set to print at the 16.67 CPI compressed print mode.

User Selectable Features

THE BACK PANEL

The switches you can use to control the model selection, language selection, and special functions are located inside the right-hand cut-out window on the rear of the printer housing. There are two switch packs, E60 and E81. E60 switches control model and language selection and E81 switches provide access to special printing functions. You must change all 487 option switches before the printer is turned on or the printer will not recognize the change.

The value of the option switches are read and their values stored only at power on.

When you receive your printer it will already be set at the positions listed in Section 1 — “HOW TO OPERATE YOUR PRINTER.” If you want to change any of these settings, refer to the sections below for specific switch settings.

The Language Select Switch Settings

Switches 1 through 5 on switch pack E60 specify the different language settings. Switches 6 through 8 specify the IBM Model to be used.

These language sets are functional only if there is both host and Foreign Keyboard support of the selected language.

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

SWITCH					LANGUAGE
1	2	3	4	5	
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	1	0	0	Danish/Norwegian
0	0	0	1	1	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	Katakana*
1	0	1	0	0	Reserved
1	0	1	0	1	Reserved
1	0	1	1	0	Reserved
1	0	1	1	1	Reserved

Table 2-2

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

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

Table 2-3

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

*Full use of these languages requires the respective optional character generator.

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.

IBM Model Select Switches

IBM MODEL	SWITCH			CODE VALUE
	6	7	8	
—	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
2(4k buffer)	1	1	0	7
—	1	1	0	7

Switch in DOWN position = 0

Switch in UP position = 1

Table 2-4

Undefined codes: 0 defaults to IBM Model 2. Codes 6 and 7 default to IBM Model 4. It is important that the printer be configured to match the controller.

Special Function Switch Settings

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

Switch #	Setting	Function
1	1	Selects "standard" default settings at power up
	0	Selects settings made permanent by CONFIG
2, 3	0 0	Original ISI form feed. (Compatible with IBM RPQ 30219) A form feed at the end of a print will advance the form to the first print position on the next form. The automatic new line normally performed at the end of the print will be suppressed. Use this setting with the twin-bin and envelope feeder.
	0 1	
	1 0	Suppress non-SCS form feeds. If forms length equals 0, the printer will ignore non-SCS form feeds. If the forms length isn't equal to 0, form feeds will be performed the same as the above setting (sw#3=0, sw#2=0). (Compatible with standard IBM 3287 printers.) An automatic new line is always performed at the end of a print.
4	1	Select function on end of job.
	0	Do not select function on end of job.
5		reserved
6	1	cut sheet feeder
	0	no cut sheet feeder
7	1	print null lines
	0	do not print null lines
8	1	print form feed on local copy
	0	do not print form feed on local copy

Switch in DOWN position = 0

Switch in UP position = 1

Table 2-5

Miscellaneous Items

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 upper left corner of the control panel. The information that may be displayed includes:

- A status code when the printer requires operator attention (for example, when the printer runs out of paper). See pages 47-49 for a list of the operational status codes and their meanings.
- The current forms length setting when you press 2ND FUNC and then SET FL.
- The current MPP when you press the 2ND FUNC key and then the SET MPP key.
- The current test number selected when you press 2ND FUNC and then DIAG.

Audible Alarm

When the printer requires your attention, the audible alarm sounds (beeps) a one second tone. It continues to beep at regular intervals until you press HOLD.

The alarm will sound when:

- The printer is out of paper.
- An error is detected and the CHECK light is on.
- The cover is open.
- The printer received a program attention action request.

CU Light

The CU LIGHT comes on when the printer has received, accepted, and is returning a response from the control unit.

What to Do If You Have a Printer Problem

First of all stay calm. Most of the problems you encounter during normal operation are called operational problems which you can fix 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 the following section, "Operational Status Codes."

Operational Status Codes

The table below lists the most common operational status codes and their meanings. 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.* Any time any of the fault codes are displayed, be sure the cover is closed and the forms lever is not in "LOAD" before calling for assistance.

To use this chart, locate the code in the left-hand column. Then refer to the middle column for the description of your problem. Finally, look in the right-hand column and follow the suggested corrective action. If the problem can't be corrected by the procedure suggested, contact your service representative or qualified service personnel at Interface Systems, Inc. by calling (313) 769-5900.

OPERATIONAL STATUS CODES		
CODE	PROBLEM DESCRIPTION	CORRECTIVE ACTION
1	paper out	Load in more paper.
2	cover open	Close top and/or acrylic covers
8	printer was left in HOLD more than 10 mins. Error condition such as cover open was left to timeout	<ul style="list-style-type: none"> • Press HOLD, then RESET. • Correct error condition then press ENABLE.
4, 10, 14	head jam	<ul style="list-style-type: none"> • Make sure forms lever is not in "LOAD." • Remove paper or any other object which may be jamming the print head. • Make sure the restraining clip has been removed.
27	printer is not receiving poll from controller	<ul style="list-style-type: none"> • Check coax cable connection. • Check the printer port you are using • Call for service
59	CANCEL pressed	No action required.
63	printer has received action request	Press PA1 or PA2 key as required by your system.
999	power failure	Turn printer off for 5-10 seconds, then power back on.

*Alarm does not sound for #8 or #27

96X*	print mechanism failure**	Turn printer off for 5-10 seconds then power back on.
97X*	print controller failure**	Turn printer off for 5-10 seconds then power back on.
98X*	format controller failure	Turn printer off for 5-10 seconds then power back on.

**“X” is currently reserved for future refinements of these error codes.

**Some mechanism faults can appear as print controller faults and vice versa. Some faults are reported only during the power up test. They also may appear as a head jam when encountered during normal operation.

These next status codes appear when more than one error occurs at once. As you fix them the next appropriate error code will be displayed. For example, if error code 11 (head jam and paper out) shows, and you fix the head jam the code 1 will be displayed until you fix the paper out condition.

3	paper out and cover open	Reload the paper and close the top and/or acrylic covers.
5, 11, 15	paper out and head jam	<ul style="list-style-type: none"> • Make sure forms lever is not in “LOAD.” • Remove paper or any other object which may be jamming the print head. • Make sure the restraining clip has been removed. Reload paper as necessary.
6, 12, 16	cover open and head jam	<ul style="list-style-type: none"> • Make sure forms lever is not in “LOAD.” • Remove paper or any other object which may be jamming the print head. • Make sure the restraining clip has been removed. Close the top and/or acrylic covers.

7, 13, 17	paper out, cover open and head jam	<ul style="list-style-type: none"> • Make sure forms lever is not in "LOAD." • Remove paper or any other object which may be jamming the print head. • Make sure the restraining clip has been removed. Reload paper as necessary and close the top and/or acrylic covers.
	paper is tearing and/or ink is smearing	Adjust the print head impression. See "Adjusting For Forms Thickness."

Table 2-6

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. This test may not mean much to you, but it will be helpful when talking with your service personnel. It may even save you a service visit from your service representative or our qualified personnel at Interface Systems, Inc.

1. Place the printer in HOLD.
2. Press the 2ND FUNC switch.
3. Press DIAG to view the current test mode (see Table 2-7).
4. If you wish to change the test mode at this time, press the "1" key until you arrive at the desired number.
5. Push the DIAG key to store the test in the printer's memory (i.e., you must press DIAG to achieve the new test, otherwise, the printer will print the original test displayed).
6. Press 2ND FUNC, then 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.
7. When the test is over, the printer returns to the primary condition.
8. To run another test, press 2ND FUNC again and repeat steps 3 through 5.
9. To re-run the same test, press 2ND FUNC, then TEST.

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

SELF-TEST DIAGNOSTICS

- 0 — version and status
- 1 — version — print version, model, ROM checksum, status
- 2 — print status "Xxyzab"
 - x — identifies the next 6 characters as a status code
 - xx 80 — not defined
 - 40 — not defined
 - 20 — not defined
 - 10 — RESET command received
 - 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 last 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 (Random Access Memory)
- 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)

ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrst
vwxyz0123456789(= ' " / ? ! \$ % & - . , : + ; *)

- 10 — prints lines of "H's" at 10 CPI until stopped
- 11 — prints spaces without advancing the form

Table 2-7

Section 3

APPENDIX SECTION

The following appendices contain information that you won't need for everyday use.

Table of Contents

Appendix A CARE AND CLEANING OF YOUR PRINTER	52
Appendix B PROGRAMMING THE ISI 487 FOR SPECIAL PRINTING FUNCTIONS	54
SELECTING PRINT MODE	54
PROGRAMMING INSTRUCTIONS FOR THE LARGE CODE OPTION	54
PROGRAMMING INSTRUCTIONS FOR THE BAR CODE OPTION	58
CODE 3 OF 9	60
Appendix C PROGRAMMING INSTRUCTIONS FOR THE CUT SHEET FEEDER	62
How To Install The Cut Sheet Feeder	62
Cut Sheet Feeder Selection	62
Bin Selection	75
Appendix D PAPER SPECIFICATIONS	80
FANFOLD FORMS DESIGN	80
CUT SHEET FORMS DESIGN	81
ENVELOPES	82
CUT SHEET FEEDER FORMS DESIGN	82
Fanfold Forms Design	82
Cut Sheet Forms Design	82
Envelope Design	83

Section 3

Appendix A

CARE AND CLEANING OF YOUR PRINTER

Your printer is clean, new, and operating beautifully and it's easy to keep it that way. Although there are no regularly scheduled preventive maintenance procedures, you should periodically inspect and clean the printer area that is immediately accessible under the top cover.

Occasionally, 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 what you use your printer for and where you use it.

CLEANING AND INSPECTING YOUR 487	
Covers	Clean all cover assemblies using a mild detergent and a lint-free cloth.
Internal Inspection	Remove the top cover and look inside for loose wires, connectors, and hardware, chafing of cables, and worn or damaged parts.
Print Head and Carriage	After removing the ribbon, use a light bristle brush to gently remove the dust and residue from the print head and carriage assembly.
Platen Assembly	Clean the platen assembly with a mild detergent.

Table A-1

There are also some general guidelines you can follow to keep the need for cleaning and maintenance to a minimum. Table A-2 lists a number of common sense tips for the care of your 487.

CARE OF YOUR 487

- Keep the covers closed whenever possible to keep out dust, dirt, fingers, and anything else that may wander in.
- Don't spill liquids (such as your morning coffee) into your printer.
- Don't drop things (paper clips, combs, gum, pencils, etc. . . .) into your 487.

- Keep fingers, ties, and hair out of the printer. It really messes things up, and it doesn't feel too good either.
- Don't let the 487 print past the top, bottom, or side edges of the paper or forms. It will dirty the platen and may damage the printhead.
- Be nice to your printer by following the directions listed in this manual. Do not yank and pull at levers, cassettes, and cables.
- Never kick, pound, or drop your printer; although, situations may arise where you would like to, I have always found the problem is usually minor and not worthy of such abuse.

Table A-2

APPENDIX B

PROGRAMMING THE ISI 487 FOR SPECIAL PRINTING FUNCTIONS

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

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
& % Q 0	200 CPS, 10 CPI dot matrix
& % Q 1	50 CPS, 10 CPI near letter quality
& % Q 2	16.67 CPI Compressed Print
& % 0 E	Prints double width characters on the entire line it is a part of.

Table B-1

To program the 487, you enter one of the four character escape sequences into the data stream where you want to change the mode. Any characters preceding the escape will be printed using the old mode. Characters following the escape will be printed using the mode you just selected. The escape is not printed.

There are no restrictions on the use of these escapes. However, when changing mode within a print line, you 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.

Programming Instructions for the Large Code 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 new line (NL) or end marker (EM) codes) and in SCS mode subject to the restrictions listed below. Information does not have to be completed in one line. The plus sign "+," as the only character in the last segment of a line, indicates another sequence is to be added to the current sequence before printing.

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 5E)

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"

Table B-2

And X is a three digit number, 001 to 132, specifying the starting print line position of the large character.

Y is a two digit number, 00 to 99, specifying the number of tenth inch lines down from the current print position that the top of the large character segment is to be printed.

Data equals 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 through Z
3. 0 through 9
4. - + . () / ' &

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

EXAMPLE: A line consisting of:

&%P;0402103ABC;(NL)

will cause three large character vertical line spaces (01." high),
and "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 characters of various sizes and at various positions as follows:

&%P(E₁) (S₁) (X₁) (Y₁) (data₁) . . . (E_n) (S_n) (X_n) (data_n)

(NL) where "n" is 2, 3, 4 . . .

The only restrictions on defining a sequence are:

1. A sequence can only have a mix of 0.1, 0.2, 0.4, 0.5, 0.6, and 0.7 inch high characters.
2. The last characters printed may not extend below a point 9.9 inches below the starting point. (i.e. ;0702094ABC; is not a legal segment)
3. Each sequence must consist of MPP-1 or fewer characters.

Any invalid sequence will be printed just as it appears in your data 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 numbers 1, 2, 4, and 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.

Print Sample

The following is an ISI 487 print sample. It shows a number of different print modes that are possible with the 487 such as standard (10 CPI) print, near letter quality print, compressed print, expanded print, expanded NLQ, expanded compressed, and big print. All these print modes and more, can be controlled from the data stream as mentioned above. In addition, NLQ and compressed print can be controlled from the 487's front panel.

A 487 compressed print

A 487 expanded compressed print

A 487 near letter quality print

A 487 expanded NLQ print

A 487 expanded print

A 487 0.1 INCH PRINT

0.2 INCH PRINT

Figure B-1

Ticket Escape Code

The ticket escape modes allow the user to reverse or advance the paper by 0.5". The new codes are listed below.

ESCAPE CODE	FUNCTION
& % T 4	Reverses paper 0.5"
& % T 5	Advances paper 0.5"

Please note that these motions are not counted as part of keeping track of paper position (such as with line feeds or form feeds). They do not affect the logical vertical position. In a given print, the number of &%T4 escapes must equal the number of &%T5 escapes if the form alignment is to be maintained.

Programming Instructions for the Bar Code Option

Any ISI 487 equipped for Large Character Label Printing is also able to print Bar Codes. Only the "picket fence" printing of bar codes, where the bars are printed vertically, is supported (see Fig. 1). The bar code symbology currently used is Code 3 of 9 and 2 of 5 interleaved and non interleaved.

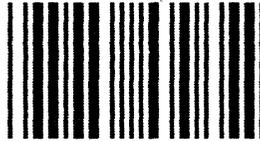


Figure 1 Picket Fence Type Bar Code.

A bar code print line is distinguished by using the large print header sequence &%P. Bar code symbols are then programmed by specifying a segment or segments up to 24 in a line. Segments are delineated from one another by a semi-colon ";". The semi-colon replaces the "logical not" sign as the segment delineator, although the latter is still supported.

A segment is defined as:

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

Where E is ";" (Hex 5E) and indicates the end of one segment and the beginning of another.

C is one letter, A to Z, indicating the selection of bar code symbology and density. Density is the number of characters per inch. (See table below for specific codes.)

BAR CODE SYMBOLOGY SELECTION CODES			
CODE	CPI	W/N RATIO*	SYMBOLOGY
A	4.8	2.9	Code 3 of 9
B	reserved		
C	2.9	2.2	Code 3 of 9
D			
E			
.			
.			
.			
Z			

Table B-3

*W/N RATIO — the ratio of dimensions between wide elements (bars or spaces) and the narrow elements (bars or spaces).

S is a two digit size code, 01-99, indicating the height of the bar code in tenths of inches (bar code height times 0.1").

X is a three digit number, 001 to 132, specifying the starting print position of the symbol.

Y is a two digit number, 00 to 99, specifying the number of tenth inch lines down from the current print position, the top of the bar code symbol is to be printed (i.e., Code 3 of 9 always begins with a bar, so the leftmost dot column in the specified print column will be printed.)

Data are the legal characters in the selected symbology such as 3 of 9.

You will specify the size and placement of the human readable characters represented by the bar code by means of regular printing or large print segment. This segment may, but will not be required to, accompany the bar code segment.

The 487 will place an Inter Character Gap (ICG) to the right of the stop or other rightmost code symbol. You will also be responsible for maintaining a "quiet zone" (the clear area before and after the start/stop characters).

There are an unlimited number of Large Print-Bar Code printing combinations. Large Print and Bar Code can be included in one single line sequence, or they can be used separately.

EXAMPLE:

&%P;C1001005 BAR CODE DATA;

0501017 LARGE PRINT DATA;

(Bar Code and Large Print Sequence)

The only restrictions on defining a sequence are:

1. A sequence can only have 0.1 to 9.9 inch high characters.
2. The last characters printed may not extend below a point 9.9 inches below the starting point.
3. Each sequence must consist of MPP-1 or fewer characters.

ERRORS: Any invalid sequence will be printed just as it is in your data.

When a series is being used, all the previously buffered material is lost and the sequence is treated as a first sequence.

Code 3 of 9

Code 3 of 9 is the bar code symbology currently in use. It is a well defined and widely used code. There are two densities available:

“A” is high density code at 4.8 CPI and 2.9 wide to narrow bar ratio

“C” is low density code at 2.9 CPI and 2.2 wide to narrow bar ratio

Data are the legal characters defined in the 3 of 9 bar code set.
(See Figure 3).

Code 3 of 9 is characterized by:

- A code structure with three wide elements out of a total of 9 elements.
(An element is the area occupied by a bar or space.)
- The 9 elements consist of five bars and four spaces.
- A full alphanumeric character set.
- A unique start/stop character, plus
- Seven other characters.

Code 3 of 9 does not include check digits. You are responsible for these, as well as the quiet zone.

The start/stop codes are provided by the printer. They are the same configuration as the “*”. If an “*” is used in the message it will be printed as just another character.

The only restrictions on defining a Large Character/Bar Code sequence in SCS mode are:

1. Combined sequence definitions may not span chains.
2. Sequences cannot include control codes i.e. “TAB.”
3. Sequences must be separated from each other and from normal text by new line codes.

Code 2 of 5

There are two types of 2 of 5 bar codes available, interleaved and non-interleaved. Both have a code structure with 5 elements, consisting of 2 wide bars and 3 narrow. They also have a numeric character set and a unique start/stop character.

Interleaved

Code 2 of 5 interleaved is a bidirectional continuous numeric bar code. It is continuous because there are no intercharacter gaps. Both the bars and the spaces contain information. All interleaved bar codes require an even number of characters. If an odd number of characters are to be encoded, a leading 0 is automatically added by the printer. For example, number 347 would be represented as 0347. There are two densities available:

“E” a high density code at 7.6 CPI and 2.9 wide to narrow bar ratio. “G” a low density code at 5.7 CPI and 2.2 wide to narrow bar ratio.

Non-Interleaved

Code 2 of 5 non-interleaved differs from interleaved in a number of ways: 1. the spaces do not contain information, 2. all of the spaces are the same width (narrow), 3. intercharacter gaps and an odd number of characters are allowed. There are two densities available.

“I” a high density code at 5.5 CPI and 2.9 wide to narrow bar ratio. “K” a low density code at 3.14 CPI and 2.2 wide to narrow bar ratio.

See the table below for a summary of differences.

INTERLEAVED	NON-INTERLEAVED
No intercharacter gaps Bars and spaces carry information. Start code = 00 Stop code = 10 Requires even number of characters.	Intercharacter gaps Only bars carry information Start code = 110 Stop code = 101 Doesn't require even number of characters.

2 OF 5 LEGAL CHARACTERS

CHARACTER	CODE*
0	00110
1	10001
2	01001
3	11000
4	00101
5	10100
6	01100
7	00011
8	10010
9	01010

*1 = wide elements
0 = narrow elements

CODE 3 OF 9 LEGAL CHARACTERS

Character	Bars	Spaces	Character	Bars	Spaces	Character	Bars	Spaces
1	10001	0100	F	01100	0010	U	10001	1000
2	01001	0100	G	00011	0010	V	01001	1000
3	11000	0100	H	10010	0010	W	11001	1000
4	00101	0100	J	01010	0010	X	00101	1000
5	10100	0100	K	00110	0001	Y	10100	1000
6	01100	0100	L	10001	0001	Z	01100	1000
7	00011	0100	M	11000	0001	—	00011	1000
8	10010	0100	N	00101	0001	.	10010	1000
9	01010	0100	O	10100	0001	SPACE	01010	1000
0	00110	0100	P	01100	0001	*	00110	1000
A	10001	0010	Q	00011	0001	\$	00000	1110
B	01001	0010	R	10010	0001	/	00000	1101
C	11000	0010	S	01010	0001	+	00000	1011
D	00101	0010	T	00110	0001	%	00000	0111
E	10100	0010						

APPENDIX C

PROGRAMMING INSTRUCTIONS

FOR THE CUT SHEET FEEDER

The following information describes the programming rules for using the triple-bin cut sheet feeder which is powered and controlled by the 487 printer. The cut sheet feeder is an option and can only be used by an ISI 487 so equipped.

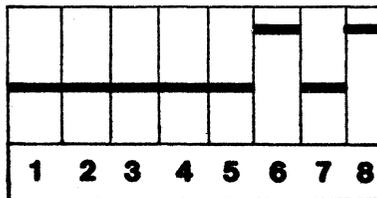
The cut sheet feeder comes ready to be attached to your 487, and needs no electrical connections to install or operate it. It has three bins which accept fixed-width, variable-width, and envelope cartridges. These cartridges are interchangeable and make paper loading fast and easy. The interchangeable inserts allow one cartridge to handle different sizes and types of papers. A standard paper tray is also included with the feeder. It mounts on the front of the feeder and collects sheets as they leave the printer in proper collating order.

Bin selection and deselection is controlled through the data stream with ISI's specially designed escape codes or manually through the control panel. Parameters can be set for each bin through the control panel as well.

Preparing Your Printer for the Cut Sheet Feeder

To prepare your printer for the cut sheet feeder refer to Figure C-2 and do the following. Make sure the printer is on a flat, stable surface and will not fall off during the installation procedure.

1. The first thing you should do is place switch number 6 in rear panel switch pack E81 in the UP position. (See Figure C-1). This will tell the printer to use the cut sheet feeder. (Remember that a change in these switch positions is only recognized by the printer at power ON. Thus, you must make sure the power is OFF while you are changing the setting.)



E81

Figure C-1 Switch Pack E81.

2. Remove the paper inlet and outlet.
3. Remove the rear cover and put it where it won't get stepped on.

4. Remove any paper left in the printer. (Make sure the paper guides are closed.)
5. Loosen the left tractor locking lever, slide to the extreme left, and then lock it into place.
6. Loosen the right tractor locking lever, slide to the extreme right, and then lock it into place.

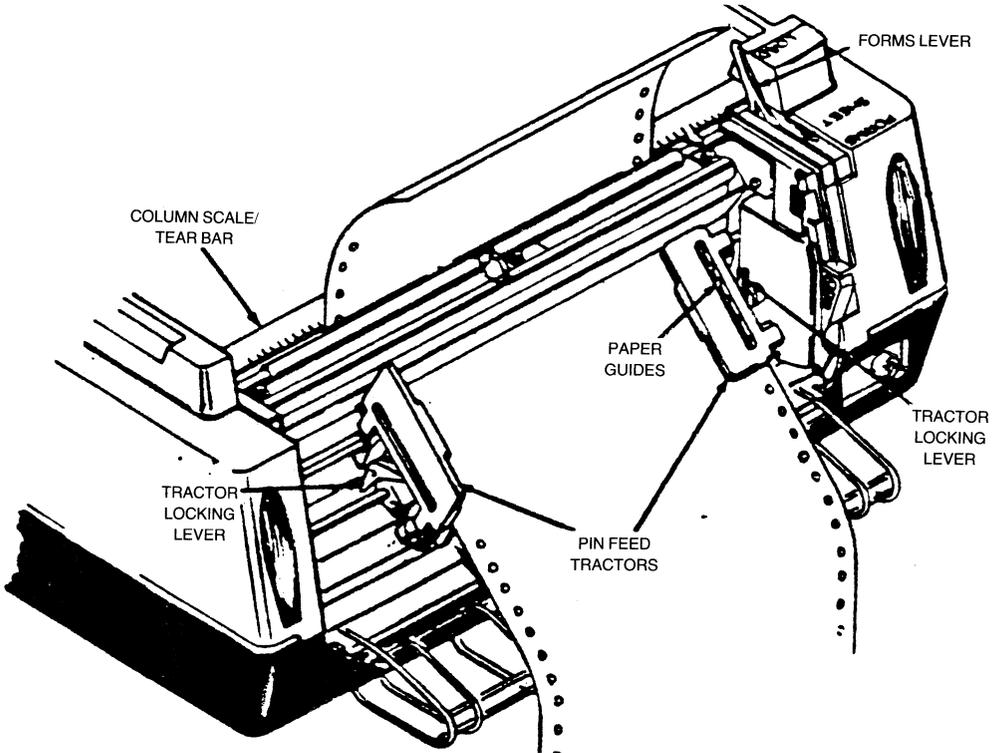


Figure C-2 Preparing Your Printer for the Sheet Feeder

Tractors must be as close to the printer's side frames as possible or paper jamming may occur.

7. Move the forms lever to SHEET.
8. Remove the acrylic cover attached to the top of the printer. To remove the acrylic cover:
 - a.) Face the side of the printer so your right hand is at the rear of the printer, and your left is at the front end.
 - b.) Put your left hand on top of the cover for leverage. Grasp the middle of the acrylic cover with your right hand.

- c.) Pull the cover toward you and lift up, bowing the cover in the middle.
 Note: The acrylic cover does not come off easily, so pull hard.
- This should loosen the end farthest from you so you can lift the cover off the peg.
9. Once the standard acrylic cover is removed, replace it with the acrylic cover shipped with your sheet feeder. To attach:
- Insert the cover end nearest you in the slot.
 - Pull the cover toward you, bowing it in the middle, and insert the other peg into the opposite slot.

After you have completed these preliminary procedures, you are ready to attach the feeder.

Attaching the Cut Sheet Feeder

To attach the cut sheet feeder refer to Figure C-3 and do the following:

- Face the front of your printer.
- Pick up the sheet feeder and carefully guide the right then left ends of the feeder adjustment rod into the mounting slots at the rear body cover.
- Once the rod is in the slots, grasp the sides of the sheet feeder and lower it. Check to see if the sheet feeder housing contacts either of the printer link shaft holders.

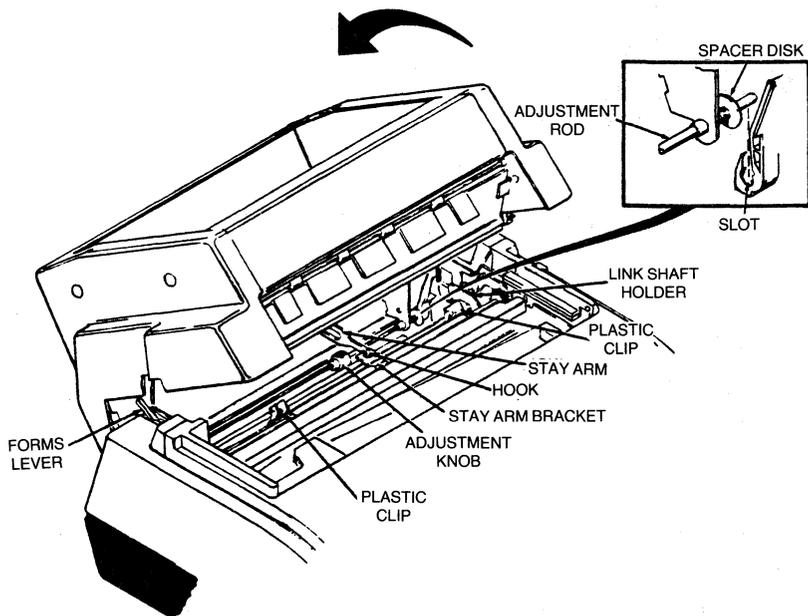


Figure C-3 Attaching the Sheet Feeder

4. If it does contact a shaft holder, turn the sheet feeder adjustment knob to change the lateral position of the sheet feeder. Turn the knob UP to move the feeder to the RIGHT side, and DOWN to move it to the LEFT. Continue adjusting until the housing does not contact the link holder(s).

One full turn of the wheel moves the feeder approximately 1/20".

5. Firmly grasp the sheet feeder stay arm, pull the arm forward, and insert the arm hook into the arm bracket as shown.
6. Tilt the feeder back to lock the hook in place.
7. Lower the sheet feeder until the upper feeder support rod snaps into the plastic mounting clips that are on the printer platen. (You should hear a dull snapping noise when it connects.)

Now your printer is in operating position, but it isn't ready yet. Horizontal adjustment of the sheet feeder is usually required after initial installation. Before you can adjust it, however, you need to know how to load the cartridges and the bins.

Loading Paper Into the Cartridges

The Paper:

Always use new paper in the feeder. The quality and condition of the paper you use in the sheet feeder is important. If you use suitable paper which is in good condition, the sheet feeder will operate smoothly and efficiently. If you use unsuitable paper you will have problems.

To make sure the paper is suitable for loading, follow these inspection procedures:

1. Choose the package of paper you want to use and inspect the wrapper. If it is torn, dented, or otherwise damaged be sure the enclosed stack of paper is not damaged as well.
2. If the paper looks undamaged, open the wrapper for a closer inspection.
3. Riffle through the stack of paper and remove any torn or wrinkled forms.
4. If you are using letterhead or other printed sheets, make sure they are all positioned the same way.
5. Square off the sheet edges to make a neat stack.
6. Lay the stack aside, with sheet sides to be printed facing up, until you are instructed to load it into the cartridges.

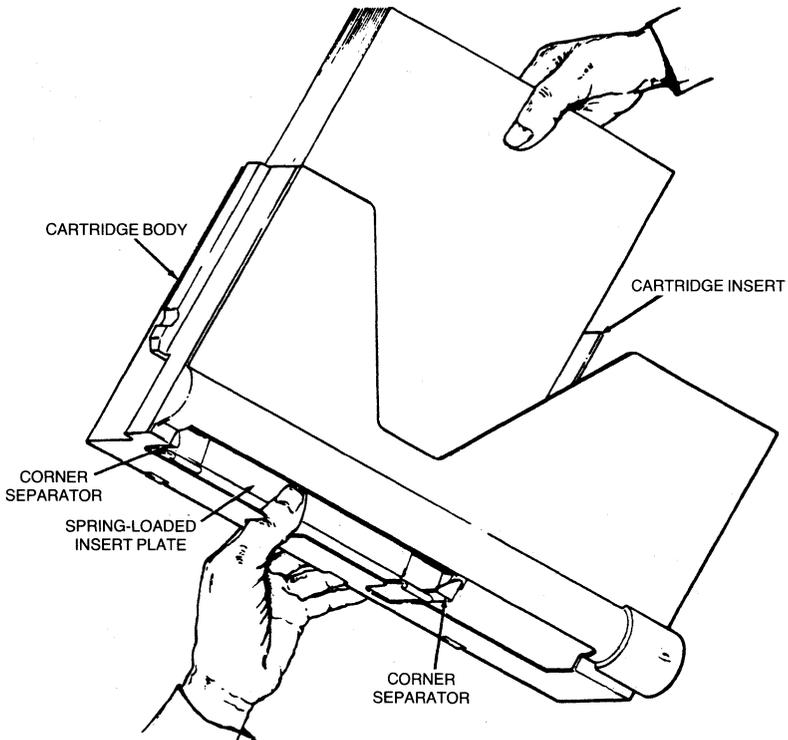


Figure C-4 Sheet Loading

Basic Paper Loading Procedure:

The basic procedure for loading the paper is the same for all the cartridges. There are some variations for the envelope cartridge, however. (See "The Envelope Cartridge" section for details on adjusting for different paper sizes. #3.)

Refer to Figure C-4 and do the following to load sheets into the cartridges:

1. First, follow steps 1-6 above.
2. Then, remove the empty cartridge from the packing box.
3. (If you are using the envelope cartridge, refer to the appropriate section for instructions on adjusting for different paper sizes. If you are using a fixed-width cartridge go to step #4.)
4. Grasp the bottom, middle part of the cartridge — keep fingers against the back, palm against the base, and thumb pressing down on the spring-loaded insert plate.
5. Pick up the stack of sheets and place in the cartridge insert.

Overloading the cartridge may result in improper feeding.

- When the bottom of the stack presses against the base of the insert, release the spring-loaded plate. The top sheet will press against the feed rollers.

Make sure all sheets are below the corner separators and against the base of the insert or misfeeds may occur.

- Adjust the “T” shaped paper support (pull up to raise; push down to lower). Ideally, the support should be extended so that the top of the “T” is just below the top of the stack of sheets. Load the cartridge into a bin. (Refer to Section C.4 for details.)
- Select the feeder and load from bin 1, 2, or 3 using the procedure described in Section C.8.

Table 1-C Cartridge Media Compatibility

<p>FIXED-WIDTH CARTRIDGE, U.S. Paper Width Paper Length Paper Weight Capacity</p>	<p>Can be used in all bins 8.5" 6"-14.0" 16 lb.-24 lb. (60-90 g/m²) 150 sheets, 20 lb. paper (capacity varies for different types/weights of paper)</p>
<p>FIXED-WIDTH CARTRIDGE, EUROPEAN Paper Width Paper Length Paper Weight Capacity</p>	<p>Can be used in all bins 210 mm 80 mm-297 mm 16 lb.-24 lb. (60-90 g/m²) 150 sheets, 20 lb. paper (capacity varies for different types/weights of paper)</p>
<p>ADJUSTABLE-WIDTH ENVELOPE CARTRIDGE Envelope Size Paper Weight Capacity</p>	<p>Can be used in bin 1 only #9; 8.875" x 3.875" (225 mmx98 mm) #10; 9.500"x4.125" (24 mm-105 mm) 20-24 lb. (75-90 g/m²) 50 envelopes</p>

The Fixed Width Cartridge:

A spring loaded insert holds paper in place inside the cartridge body. This insert can be positioned at the left or right side of the cartridge to permit special types of printing. Normally, the insert is justified LEFT, i.e., positioned at the left side (facing front) of the cartridge. (See table 1-C for details.)

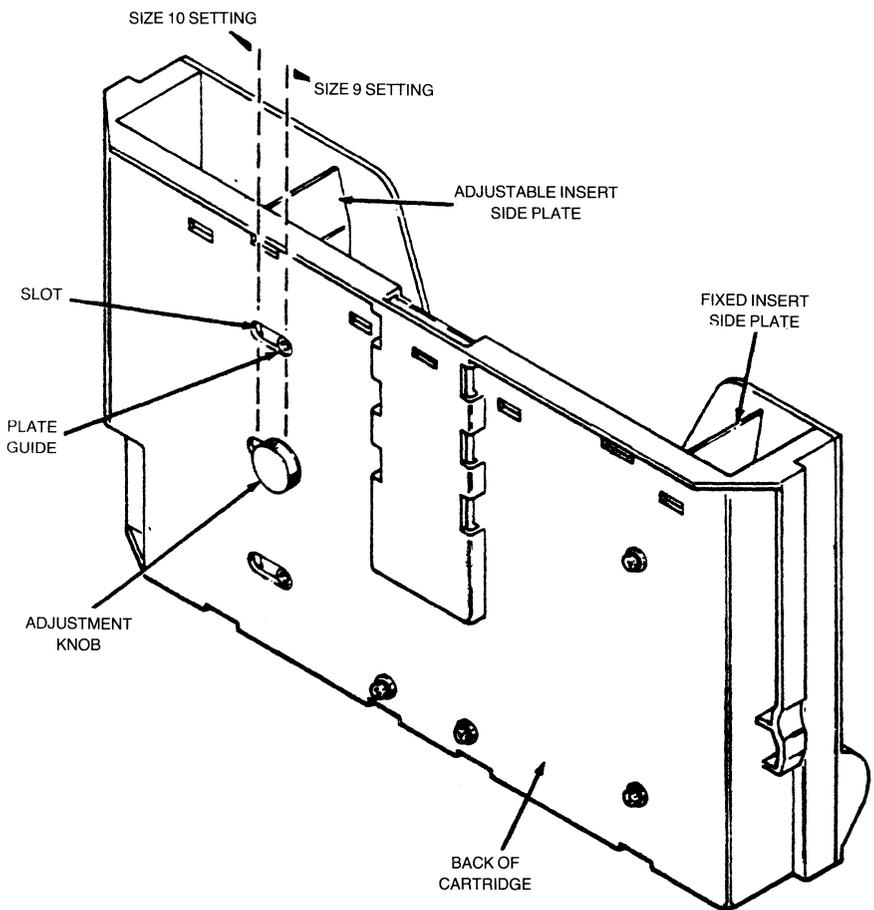


Figure C-6 Adjustable Envelope Cartridge; Set for Size 9 Envelopes.

The Envelope Cartridge:

The envelope cartridge can be adjusted to hold size #9 or #10 envelopes. You should adjust the insert before you load the envelopes. To adjust for size 9 envelopes do the following:

1. Loosen the adjustment knob at the back of the cartridge (See Figure C-6)
2. Move the adjustment knob to the far right.
3. Tighten the knob to lock the adjustable side plate in position.

To adjust for size 10 envelopes:

1. Loosen the knob.
2. Move the knob to the far left.
3. Tighten the knob to lock the adjustable side plate in place.

Load the cartridge into bin 1.

The envelope cartridge can only be loaded into the front bin of the sheet feeder. Never load the cartridge into the middle or the rear bin.

Because of design differences between cut paper envelope cartridges, left edges of paper do not line up with left edges of envelopes. Envelope edges are 1" to the right of cut sheet form edges.

Loading Cartridges Into the Sheet Feeder

Six slots mounted on the inside left and right side frames of the feeder compose the feeder bins. The front pair of slots compose bin 1, the middle pair bin 2, the rear pair bin 3.

The feeder will operate with one, two or three bins loaded. You can load three paper cartridges, or one envelope cartridge and two paper cartridges. The envelope cartridge can only be used in bin 1.

To load a cartridge refer to Figure C-7 and perform the following steps:

1. Facing the front of the feeder, position the cartridge above the required bin (pair of slots). The cartridge selector gear should be to your right.
2. Carefully guide either end of the cartridge into the slots on the side frames.

3. Grasp the end of the cartridge and push down until the cartridge locks into place in the bin.

Apply equal pressure at both ends while pushing to avoid binding.

To unload a cartridge:

1. Perform steps 1 through 3 above, in reverse order.

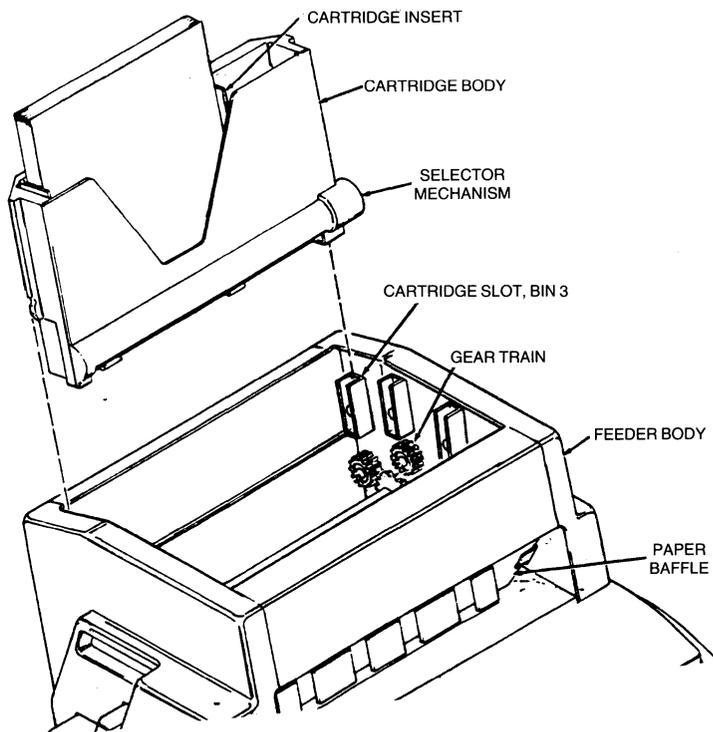


Figure C-7 Loading Cartridges.

Adjusting the Sheet Feeder

Now that you know how to load the paper and the cartridges, you may adjust the sheet feeder. To tell if your feeder needs horizontal adjustment, perform the following steps:

1. Load sheets into a cartridge. Be sure the cartridge insert is justified LEFT.
2. Load the cartridge into bin 1 (front bin).
3. Load a sheet into the printer from bin #1 of the feeder. Refer to Section C.11 for sheet feeder loading instructions.

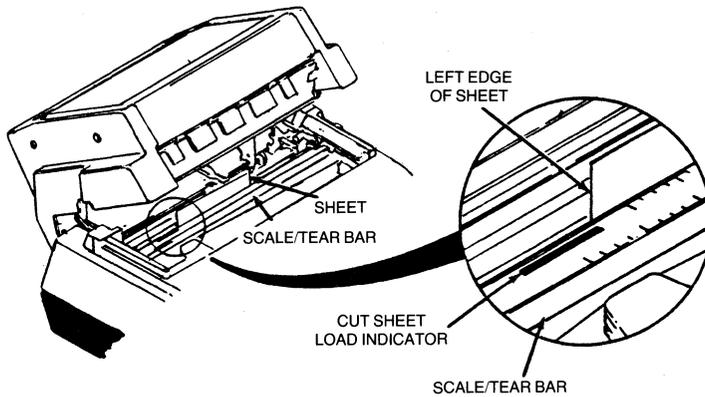


Figure C-8 Adjusting the Sheet Feeder.

4. Lift the feeder body up and note how the left edge of the sheet that is in the printer lines up with the right edge of the cut sheet indicator on the silver scale tear bar (see Figure C-8).
5. If the edge of the sheet lines up with the edge of the load indicator, the feeder is properly aligned with the printer and no horizontal adjustment is required. Skip the adjustment sections and go to Section C.7, "Installing the Paper Tray."
6. If the sheet does not line up with the edge of the indicator, perform the adjustment described in the following section.

How to Adjust the Sheet Feeder

This procedure involves turning the feeder adjustment rod to change the lateral position of the feeder on the printer. The adjustment rod in your feeder is turned using either (1) an adjustment wheel, which is at the back of the feeder, or (2) an adjustment knob, which is inside the feeder body.

Look at the back of your feeder to determine if it has an adjustment wheel like that shown in Figure C-6. If the wheel is present, perform steps 1 and 2 below. If your feeder does not have the wheel, skip to steps 3 through 7 below.

The Adjustment Wheel:

1. Turn the adjustment wheel UP (see Figure C-9) to move the feeder closer to the LEFT (form lever) side of the printer. Turn the wheel DOWN to move the printer toward the RIGHT (control panel) side of the printer.*
2. Eject the loaded sheet (by pressing HOLD and FORM FEED) and load another (by pressing HOLD, 2ND FUNC and F1) to determine if the new sheet lines up with the edge of the indicator. Repeat steps 1 and 2 until alignment is correct.

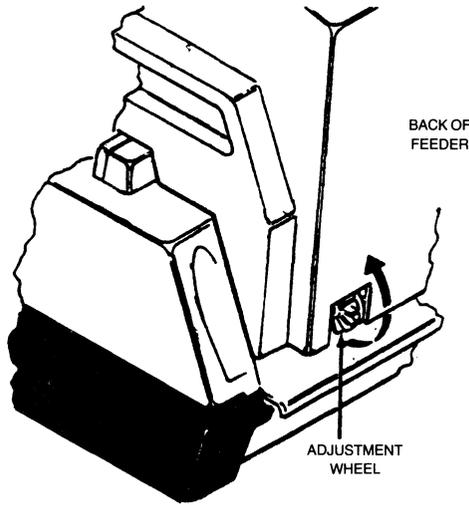


Figure C-9 Horizontal Adjustment Wheel.

Adjustment Knob

1. Tilt the feeder body back and locate the horizontal adjustment knob, shown in detail in Figure C-10.
2. Tilt the feeder all the way back to gain access to the adjustment knob.
3. Turn the knob UP (see Figure C-10) to move the feeder toward the RIGHT (control panel) side of the printer. Turn the knob DOWN to move the feeder toward the LEFT (forms lever) side of the printer.*
4. Lower the feeder back into operating position. Eject the loaded sheet (by pressing HOLD and FORM FEED) and reload another sheet (by pressing HOLD, 2ND FUNC and F1), then determine if the edge of the new sheet lines up with the edge of the indicator.
5. Repeat steps 4 through 6 until alignment is correct.

*Note: One full turn of the knob or wheel moves the feeder approximately 1/20".

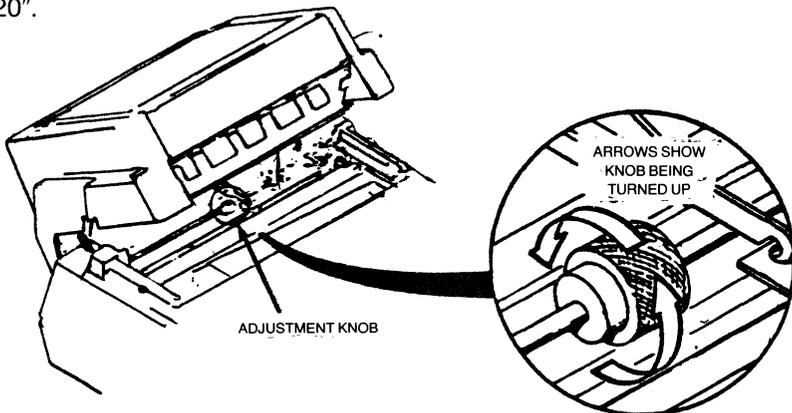


Figure C-10 Horizontal Adjustment Knob.

Paper Tray Installation

The tray attaches to the front of the feeder. To install the tray, refer to Figure C-11 and do the following:

1. Tilt the tray up while pushing down and guide the tray into the feeder body so that the back panel of the tray is just behind the baffle dentations.
2. Lower the front of the tray until the front supports contact the printer top cover.
3. Pull the tray forward until the baffle dentations press against the back panel.
4. To remove the tray, pivot the tray up while pushing down and pulling forward.

To eliminate the possibility of the paper tray falling to the floor, always REMOVE THE TRAY BEFORE LIFTING THE FEEDER BODY to clear paper jams or to make adjustments.

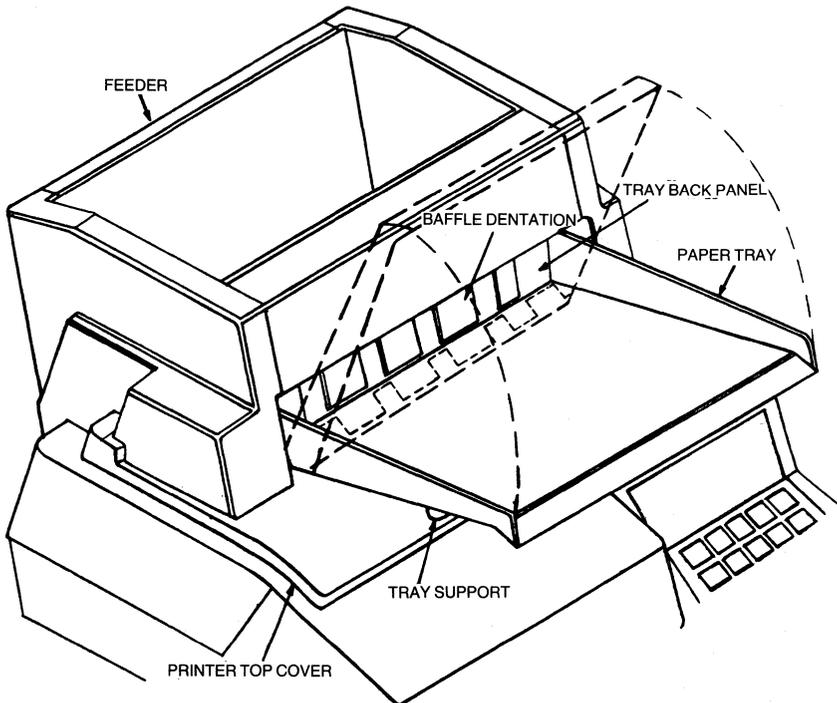


Figure C-11 Paper Tray Installation.

Bin Selection

The next thing you should do is choose which bin you want. You can do this two different ways: through the front panel, or through the data stream.

The Front Panel

To choose the bin you want through the front panel press HOLD and 2ND FUNC, then 1 key. If the bin you want is selected, press 2ND FUNC.

- The FUNCTION light will go on.
- A bin will be selected. (The front bin is 1, the middle bin is 2, and the back bin is 3.) Each time the 1 key is pressed, the next bin will be selected. For example, bin 1 changes to bin 2, bin 2 changes to bin 3, and bin 3 changes back to bin 1.
- The LED status indicator will display the number of the bin selected. After the correct bin has been selected, press F3 to load the new bin value into memory. To save this value permanently use the CONFIG key procedure on pages 37, 38.
- The next sheet will be fed from the selected bin.

If no bin is specified, the printer will use bin 2. The bin can also be selected through escape codes in the data stream, see below for details.

Any selection remains in effect until it is changed through the data or the front panel, or until the printer is powered off.

The Data Stream

To select a particular bin during a print under control of the host program you may use the cut sheet feeder header sequence. This header sequence is `&%H` and must be the first three characters of any cut sheet feeder line. The automatic sheet feeder bin selection escape codes are:

BIN	ESCAPE CODE
1	<code>&%H1</code>
2	<code>&%H2</code>
3	<code>&%H3</code>

Once the escape is entered, the next sheet fed, will be fed from the selected bin. It is possible to feed sheets from all three bins during one printing job by using the escape codes. For example, by using these codes you may program the 487 to feed from bin one for the first page of a letter, then bin two for the second page, and bin three for the third page. A number of other combinations may be used to fit your particular need. When no automatic

sheet feeder is installed, the escape sequences will be accepted, but will not have any effect on printing.

Forms Length

The forms length for all bins will be determined from the normal power on value. (The forms length setting procedure is no different than before. (See pgs. 36, 37.) The automatically fed cut sheets will be printed the same way the manually fed cut sheets were. The bottom of the first line available for printing is one inch below the top edge of the paper. The bottom of the last line will be one-half inch above the bottom of the paper. For example, 58 lines can be printed on a form set up as 66 lines at 6 LPI. The default values for the bins are: bin 1 (envelope bin) — 23 lines, and bin 2 and 3 — 66 lines per inch.

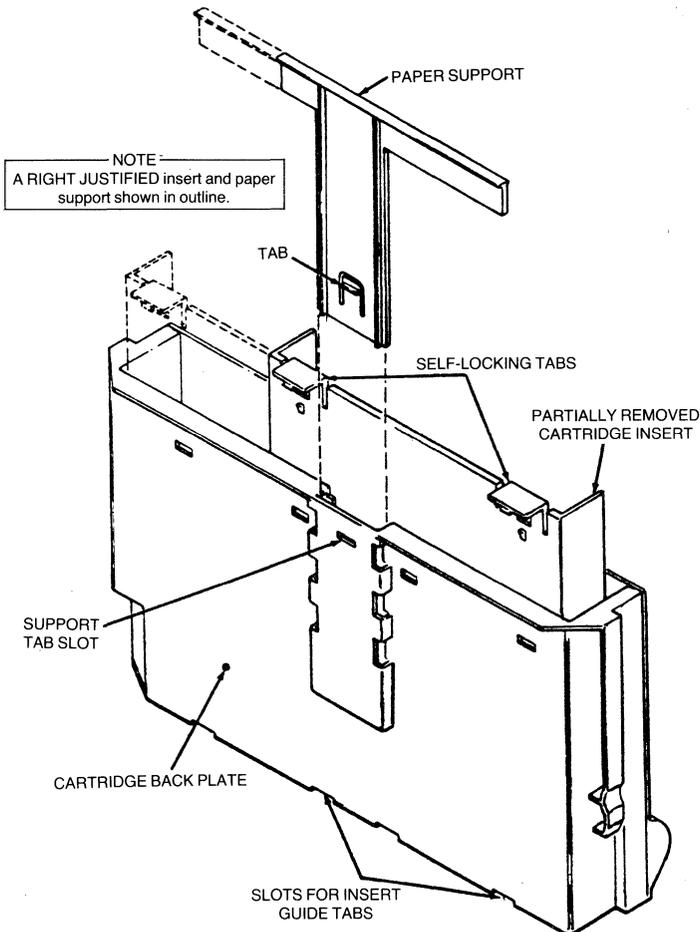


Figure C-12 Removing/Replacing Fixed Width Cartridge Insert.
Removing/Replacing the "T" Shaped Paper Support.

Removing/Replacing Fixed Width Cartridge Inserts

The cartridge inserts may be left or right justified to meet the printing requirements at hand.

TO REMOVE AN INSERT (refer to Fig. C-12)

1. Remove the cartridge from the feeder.
2. Remove the sheets loaded in the insert.
3. Raise the paper support to its maximum extended position.
4. Facing the cartridge backplate, unsnap the self-locking insert tabs which secure the top of the insert to the cartridge back plate.
5. Pull the insert up and out of the cartridge.

TO REPLACE AN INSERT (refer to Fig C-12)

1. Ensure paper support is in place and properly justified.
2. Guide the insert into the cartridge body.
3. Slide the insert to the extreme left or right to justify as required.
4. Tilt the base of the cartridge up and adjust the insert left/right until the two guide tabs at the bottom of the insert are positioned in the slots in the cartridge base.
5. Snap the two top insert tabs into locked position by pressing the top of the insert against the cartridge back plate.

Removing/Replacing the “T” Shaped Paper Support

The paper support should always be justified in the same direction as the cartridge insert (see Fig C-12) To reverse justification of the support, perform the removal/replacement procedures described below.

TO REMOVE THE PAPER SUPPORT — Get a flatblade screwdriver and do the following:

1. Remove the cartridge from the insert.
2. Raise the paper support until it locks into maximum-extended position.
3. Insert the edge of the screwdriver into the support tab slot and gently push the tab back while pulling the support up and out of the cartridge.

TO REPLACE THE SUPPORT:

1. Make sure the insert is removed from the cartridge.
2. Insert the support into its guide, making sure the support arm is justified in the proper direction.

You may now install the cartridge insert.

If you have any problems with your sheet feeder refer to the table on page 00. If you still cannot correct the problem after consulting this chart, call our qualified personnel at Interface Systems, Inc. The number is (313) 769-5900.

What to Do if You Have Problems With The Sheet Feeder

This section provides suggestions for correcting paper handling problems such as misfeeds, jam, etc.

Jam/misfeeds should be corrected immediately to avoid possible damage to a mylar paper guide inside the sheet feeder body.

Most paper handling problems can be corrected quickly and with minimal effort. The following chart lists the more common paper handling problems, lists possible causes, and describes the actions you should perform to correct the problems.

Problem	CAUSE	Corrective Action
Paper will not feed at all.	<p>Cartridge Empty. Cartridge installed incorrectly in bin.</p> <p>Feeder body not engaging printer mounting blocks Paper in cartridge too wide or poorly stacked</p> <p>Paper too heavy.</p>	<ul style="list-style-type: none"> • Load cartridge • Make sure cartridge is installed squarely and “bottomed” in the bin. • Make sure body engages blocks. • Make sure paper is correct width and is neatly stacked in cartridge. • Make sure paper doesn't exceed maximum paper weight of 24#.
Partial Feed	<p>Faulty selector Assembly. Paper in cartridge too wide or poorly stacked.</p> <p>Paper too heavy</p>	<ul style="list-style-type: none"> • Replace selector assembly. • Make sure paper is of proper width and is neatly stacked within cartridge. • Make sure paper doesn't exceed 24# maximum weight.

Problem	CAUSE	Corrective Action
Partial Feed (continued)	Paper not flat, wrinkled, etc.	<ul style="list-style-type: none"> • Make sure paper is flat and wrinkle-free. • Clear obstruction.
Incomplete insertion	Paper path obstructed. Printer forms lever not in "SHEET" position. Printer forms lever not in "SHEET" position. Forms length/lines per inch ratio too low for length of paper being used.	<ul style="list-style-type: none"> • Set forms lever to "SHEET." • Set forms lever to "SHEET." • Verify forms length and LPI settings (refer to pg. 76) and make sure the ratio is correct.
Excessive insertion	Forms length/LPI ratio too low for length of paper being used.	<ul style="list-style-type: none"> • Verify forms length and LPI settings (refer to pg. 76) and make sure the ratio is correct.
Paper buckles in print cavity during insertion	Paper path in printer is obstructed. Printer paper tear bar adjusted wrong. Printer paper set plate is damaged.	<ul style="list-style-type: none"> • Remove obstruction. • Adjust tear bar. Replace the set plate.
No or incomplete paper discharge	Paper/envelope not flat, wrinkled, etc. Mylar gate on feeder's upper paper guide assembly is damaged. Feeder adjusted incorrectly	<ul style="list-style-type: none"> • Make sure paper/envelopes are flat and wrinkle-free. • Replace upper paper guide assembly • Perform horizontal adjustment (see pg. 73)

Paper Specifications

See Appendix D for details.

APPENDIX D

PAPER SPECIFICATIONS

The 487 uses tractor-fed single or multi-part forms or single cut sheets of paper. The following sections list the various specifications you should follow when selecting paper for the 487.

The paper you select should:

- fit the specifications listed below.
- be removed from the box before being used.
- be in line with the pin feed tractors (i.e., the paper should not be fed from three feet behind and to the right of the printer.)
- be stored in an area free from both high and low humidity.

Fanfold Forms Design

Fanfold forms should fit the specifications listed below.

- Forms may be glued or crimped.
 - Crimps must be spaced a minimum of 2.0 in. (50.8 mm) along both edges of the forms and not within 0.5 in. (12.7 mm).
 - Metal staples cannot be used.
1. Size: See Figure D-1 for size specifications.
 2. Thickness:
 - Single part — 0.010 in. (0.25 mm)
 - Multi-part — 0.0204 in. (0.52 mm) maximum, up to six part with carbon.
 3. Weight:
 - Single part — 15-20 lb. bond (56 g/m²)
 - Multi-part

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

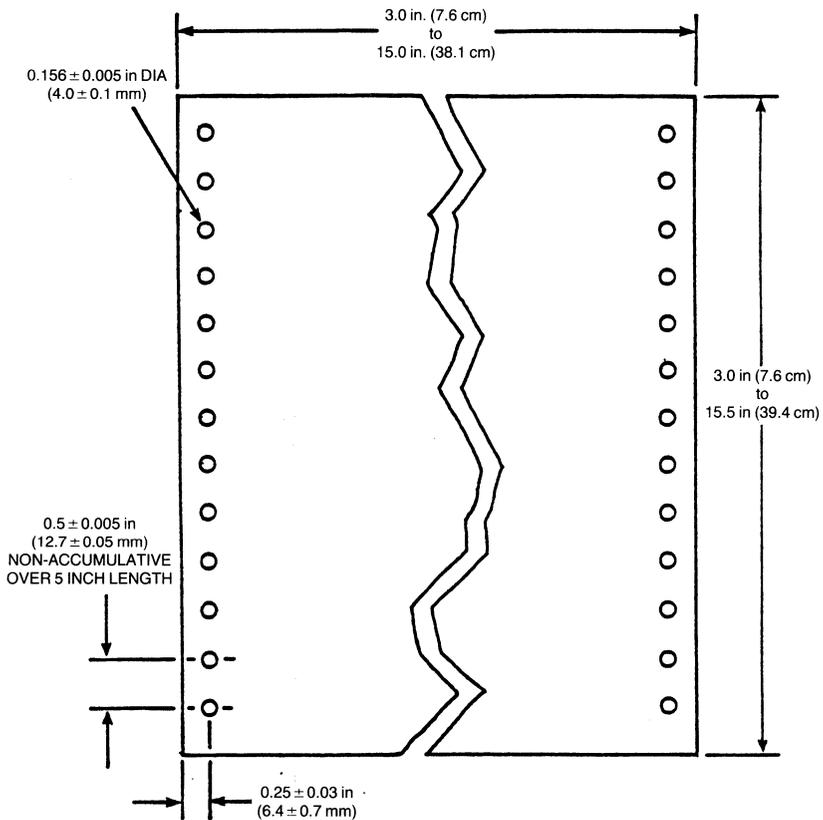


Figure D-1 Fanfold Forms Design.

Cut Sheet Forms Design

Cut sheet forms should fit the specifications listed below.

- Multi-part forms may be glued on the top or bottom.
- Stapled forms may not be used.
- Split forms with each side containing a different thickness or number of sheets are not recommended.
- On multi-part forms, use 12 lb. (45 g/m²) as the first copies with heaviest copies last.

1. Size: See Figure D-2 for specifications.

2. Thickness:

- Single part — 20 lb. paper (70 g/m²) minimum
- Multi-part — 0.024 in. (0.52 mm) maximum

3. Weight:

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

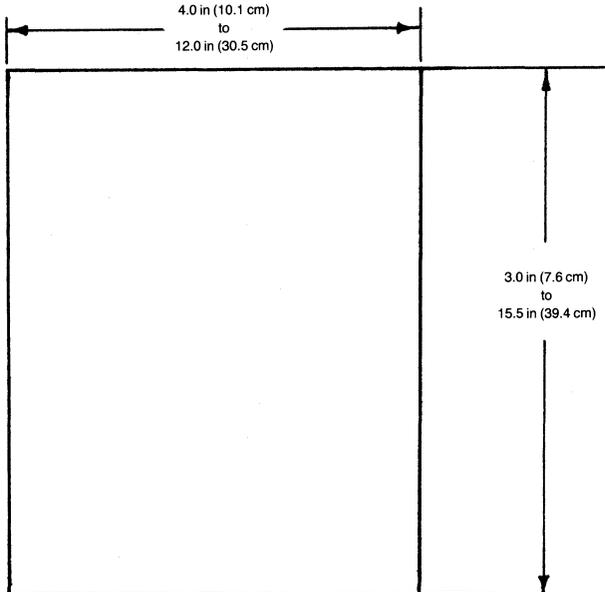


Figure D-2 Cut Sheet Forms Design.

Envelopes

1. Size:
 - Width — 304.8mm (12 in.) 127mm (5 in.) minimum
 - Length — 355.6mm (14 in.) 88.9 (3.5 in.) minimum
2. Weight — 16 lb. to 24 lb.

Cut Sheet Feeder Forms Design

The 487 Cut Sheet Feeder uses continuous forms or single cut sheets. The following sections list the various specifications you should follow when selecting paper for use in the cut sheet feeder.

The following things are not permitted:

- hard or metal fasteners
- partial forms separation
- side glued forms
- card stock forms
- multi-part forms are not recommended, but if used it is recommended that all multi-part forms be:
 1. qualified on an individual basis
 2. bottom glued
 3. of the same length
 4. of “carbonless” construction.
- printing across any holes, perforations, or edges of the form

Fanfold Forms Design

1. Size:

	Maximum	Minimum
Width		
Single-part	377.8mm (14.88 in.)	127mm (5 in.)
Multi-part	377.8mm (14.88 in.)	127mm (5 in.)
Length	355.6mm (14 in.)	76.2mm (3 in.)

Cut Sheet Forms Design

1. Size:

	Maximum	Minimum
Width		
Single-part	304.8mm (12 in.)	148mm (5.83 in.)
Multi-part	304.8mm (12 in.)	148mm (5.83 in.)
Length	355.6mm (14 in.)	Bin 1 — 152.4mm (6.00 in.) Bin 2 — 152.4mm (6.00 in.) Bin 3 — 203.2mm (8.00 in.)

Weight

Single-part	20 lb to 24 lb
Multi-part (front sheet)	20 lb to 25 lb

2. Thickness .51mm (.020 in.) max.

Envelope Design

1. Size:

#9 98mm (3.88 in) x 225mm (8.88 in.)

#10 241mm (9.5 in) x 105mm (4.13 in)

2. Weight:

20 lb to 24 lb (#24 diagonal fold recommended)

Note: When using the cut sheet feeder, sequentially feeding cut sheet forms and envelopes is not recommended due to varying forms thicknesses. Also, when using the feeder, envelope width tolerances of $\pm 1/16$ inches are required for most reliable feeding.

European, A4 Design

1. Size:

210 mm (8.3 inches) x 297 mm (11.7 inches)

Notes: European A4 paper can be used in cut sheet mode as though it were 12 inch continuous forms at 6 lines per inch.

When the form length is set to 000 and cut sheet operation is in effect, the printer will set itself up for A4 paper as follows.

1. When a sheet is inserted, the form will come to rest so that the first line of print will sit on a line 10.56 inches (268.3 mm) above the bottom of the form.
2. Sixty-four lines of text will print on the page.
3. The sixty-fifth line will overlap the bottom edge of the form.
4. Lines sixty-six to seventy-two will print on the platen.
5. When the seventy-second New Line is performed, the form will be ejected and the next form is inserted.

It is the user's responsibility to ensure that the lines printed on the platen are all blank.



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