IBM

Proprinter

Guide to Operations

PN6328945

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The warranty terms and conditions for the printer (except for the U.S. and Puerto Rico) are available from your supplier. Please retain them with your proof of purchase.

No statements contained in this documentation shall affect the statutory rights of consumers.

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FCC Notice (U.S.only)

The IBM Proprinter generates and uses radio frequency energy. If the printer is not installed and used in accordance with the operating instructions, technical or service information, it may interfere with radio or television reception. It has been tested and found to comply with the limits for a Class B computing device pursuant to Subpart J of Part 15 of Federal Communications (FCC) rules, which are designed to provide reasonable protection against such interference when operated in a residential area. If this printer interferes with radio or television reception, which can be determined by switching the printer off and on, the user is encouraged to try one or more of the following:

- Move the receiving antenna on the radio or television;
- Relocate the printer in relation to the radio or television;
- Plug the printer into a different electrical outlet from the radio or television.

If necessary contact your IBM Authorized dealer for additional suggestions. The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. It is the responsibility of the user to correct such interference.

Warning: To comply with FCC regulations on electromagnetic interference for a Class B computing device, the printer cable must be shielded. To assure compliance with FCC regulations for a computing device use IBM cable part number 1525612 and jumper plug part number 6493159 (parallel interface) or IBM cable part number 8509386 (optional serial interface) or other compatible cables. Use of cables not properly shielded may result in violating FCC regulations.

First Edition (April 1985)

Publications are not stocked at the address below. For copies, contact an IBM Product Center, an IBM Authorized Dealer, or your IBM Marketing Representative.

You can send comments or suggestions on the form at the rear of this guide. If the form has been removed, simply address your comments to the IBM Corporation, Information Development, Department 78C, 1001 W.T. Harris Boulevard, Charlotte, NC 28257, USA.

Information you supply may be used by IBM without obligation. You may, of course, use it yourself. Necessary changes will be made in later editions of the guide.

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DANGER
Serious shock hazards exist within the main cover of your printer. Do not remove this cover. For service information refer to the *Proprinter Hardware Maintenance and Service*.

CAUTION
This product is equipped with a UL listed and CSA certified grounded plug for user safety. The printer is to be used in conjunction with a properly grounded 110 volt AC receptacle to avoid electrical shock.

CAUTION
The print head stays hot after continuous use. Allow the print head to cool before you touch the print head.

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About This Manual

This guide describes the operation of the IBM Proprinter.

You do not need any other manuals, experience, or computer training to operate this printer.

Some knowledge of the BASIC language would help you understand Section 4, "Printer Control Codes and Escape Sequences."

"Section 1. Introduction" describes your printer.

"Section 2. How to Set Up Your Printer" shows you what to do after you unpack your printer.

"Section 3. How to Operate Your Printer" explains how to get your printer ready to print. This section also explains what the lights and keys mean.

"Section 4. Printer Control Codes and Escape Sequences"gives you descriptions of all control codes and escape codes.

"Section 5. Problem Determination Procedures" tells you the easiest and fastest way to verify your printer is working or if your printer needs service. If you need additional help with setup or operation, contact your IBM Authorized Dealer, an IBM Product Center, or the IBM Branch Office serving your locality.

"Section 6. How to Change the Switch Settings" shows you how to change the printer switches from the factory setting. You can change the switch settings to meet your particular needs.

"Section 7. How to Move Your Printer" shows you how to pack your printer for shipping.

The **"Appendices"** contain the information you need about:

What to do when the printer needs service
Parallel interface
Factory-set options

Related Publications

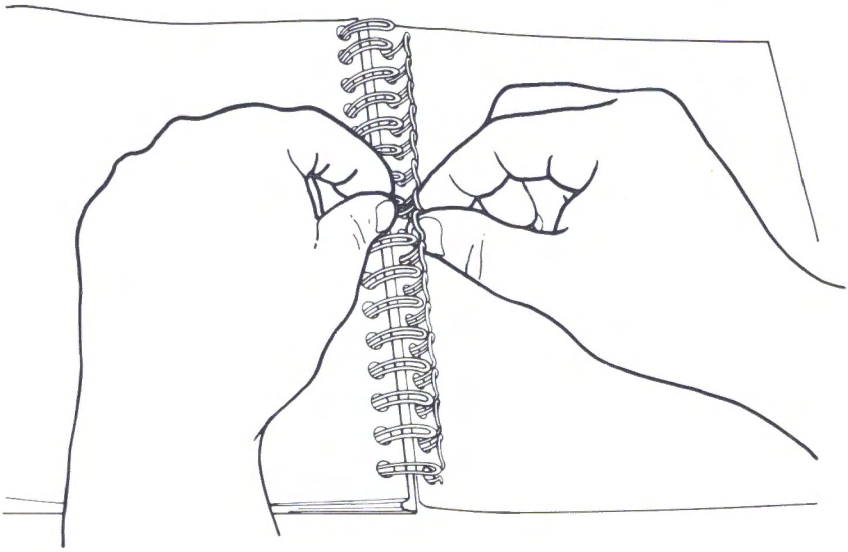
For additional technical information about your printer, read the *IBM Proprinter Technical Reference.*

For service information, read the *IBM Proprinter Hardware Maintenance and Service.*

To buy either of the manuals, contact an IBM authorized dealer, an IBM Product Center, or your IBM Marketing Representative.

How to Put this Guide into a Notebook

You can easily remove the pages of this book and put the pages into a three ring notebook or binder.



Place this guide with the front cover down and open the back cover so the wire binding shows. Spread each pair of wires apart and remove the pages.

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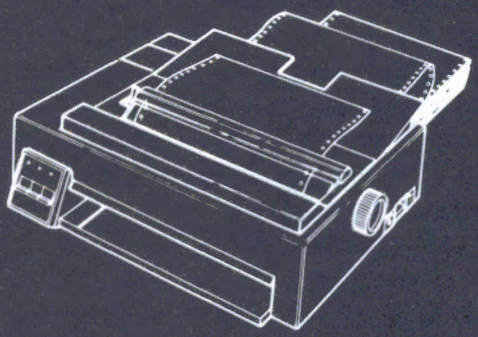
Section 1. Introduction



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Notes:

Printer Description

The Proprinter is a small but versatile tabletop printer for your personal computer or terminal. This dot-matrix printer uses a print head with nine pins (wires). The nine wires, under control of the printer, print a group of dots to form each character.

For near-letter quality (NLQ) printing, which Proprinter can produce for your letters, the dots print closer together.

The print head takes the shortest path for the next character to print. Your printer can print up to 200 characters per second (CPS). The printer feeds paper at 76.2 mm (3.0 in.) per second.

For emphasized printing, the printing speed is up to 100 CPS. For NLQ mode the printing speed is up to 40 CPS. Depending on the print mode you select, you can print from 1 to 137 characters on one 8-inch line.

Dot-Addressable Graphics

Dot-addressable graphics lets you print a dot anywhere on the paper, line-by-line. The printer can form a picture, graph, or a large chart.

Ease Of Use

Your Proprinter has many features that make it easy to use.

- Simple operator panel
- Common control coding
- Convenient, front-load cut forms feed
- Choice of cut forms or continuous forms
- Easy removal of a continuous form page after the page has printed, without wasting a page.

Simple Operator Panel

The operator panel has three lights and three keys. The lights tell you when the printer is ready to use. The keys let you control the paper feeding and make the printer ready to use.

Types of Printing

You can use your printer to print on variable-width:

- Continuous forms
- Cut forms
- Multiple-part forms up to four parts
- Envelopes
- Mail labels.

Your printer can also print:

- High-volume continuous reports
- Spreadsheets
- Word processing documents.

And, your printer has:

- Underlining and overscoring
- Mathematics symbols
- International and user-definable characters
- Superscripts and subscripts.

For programming examples, read **"Section 4, Printer Control Codes and Escape Sequences"** and the *IBM Proprinter Technical Reference.*

Design Your Own Characters

You can design your own characters or symbols. You can store in the printer memory (download) up to 94 of your own characters or symbols.

You can download any character or group of characters (font) using the design of your choice. For programming examples, read **"Section 4, Printer Control Codes and Escape Sequences"** and the *IBM Proprinter Technical Reference*.

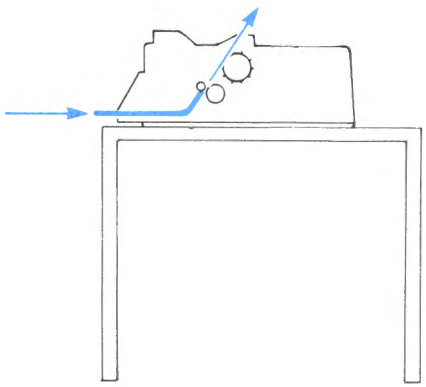
Near-Letter Quality Printing

The printer can print in near-letter quality (NLQ) mode. You can use NLQ mode to print the complete character set, including special symbols, and downloaded characters. See **"Section 4, Printer Control Codes and Escape Sequences"**.

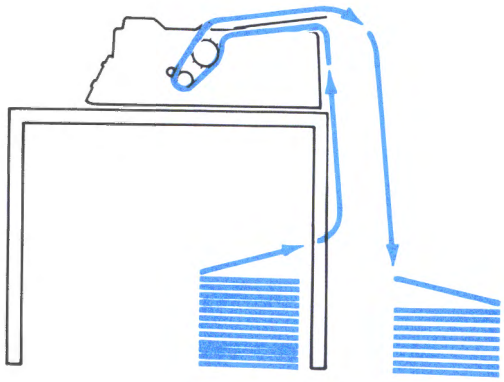
Paper Feeding

The printer has two paper-feed modes:

- The friction feed, for feeding separate sheets of paper (cut forms), lets you use your own stationery.



- The pinfeed, for feeding continuous fan-fold forms, lets you print long reports without having to use separate cut forms.



Built-In Test

Each time you switch the printer power on, the printer tests itself without printing.

Print Modes

This guide has a section that explains how to:

- Use control codes and escape sequences
- Create 10 or 12-character per inch (CPI), condensed, double wide, emphasized, and near-letter quality printing.
- Download characters of your own design.

Some of the print modes the printer uses are:

Normal, for fast printing

12 characters per inch, 96 characters per line

Compressed, small characters , up to 137 characters per line

Emphasized, for dark printing

Near letter quality, nice printing

Near letter quality and emphasized, for highlighted printing

Emphasized and double strike, for very dark printing

Near letter quality at 12 characters per inch

Near letter quality and emphasized, for highlighted printing at 12 characters per inch

Emphasized and double strike, for very dark printing at 12 characters per inch

Superscript or subscript

Superscript/Subscript compressed for very small characters

Double wide, for large characters

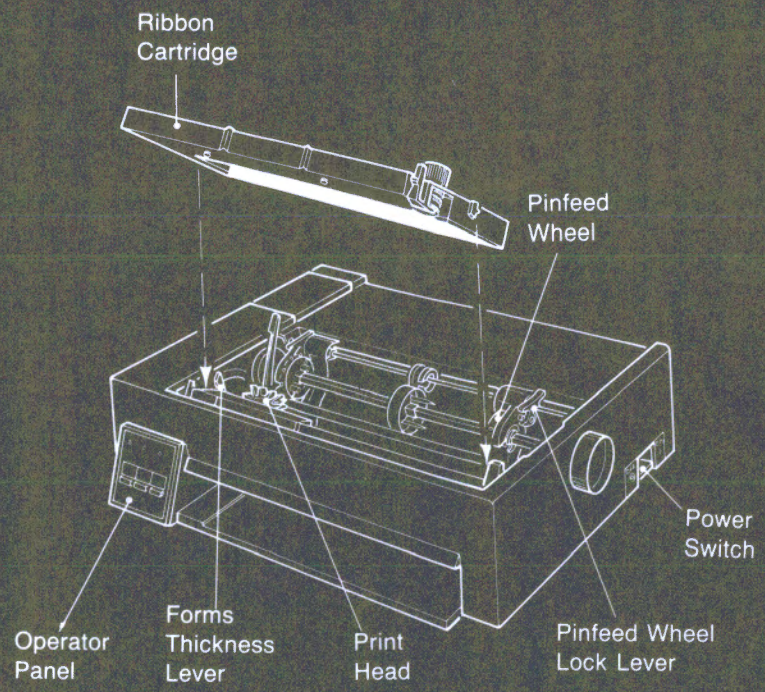
Double wide, near letter quality, and 12 characters per inch

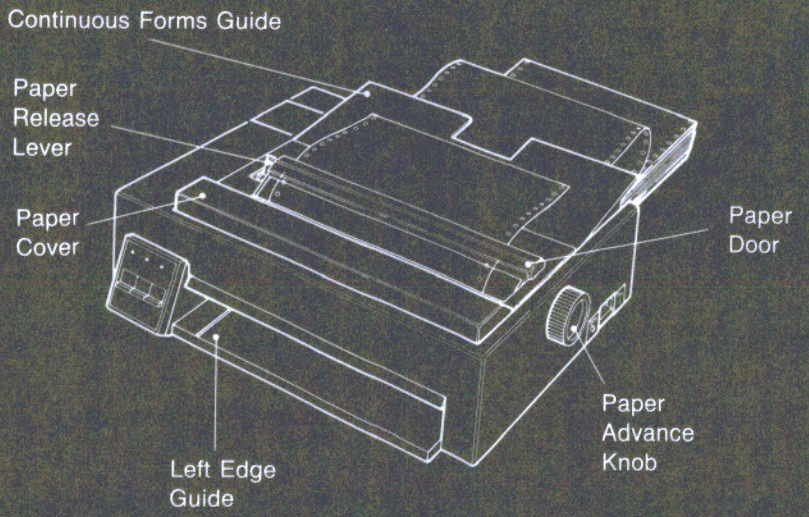
Double wide, double strike, emphasized

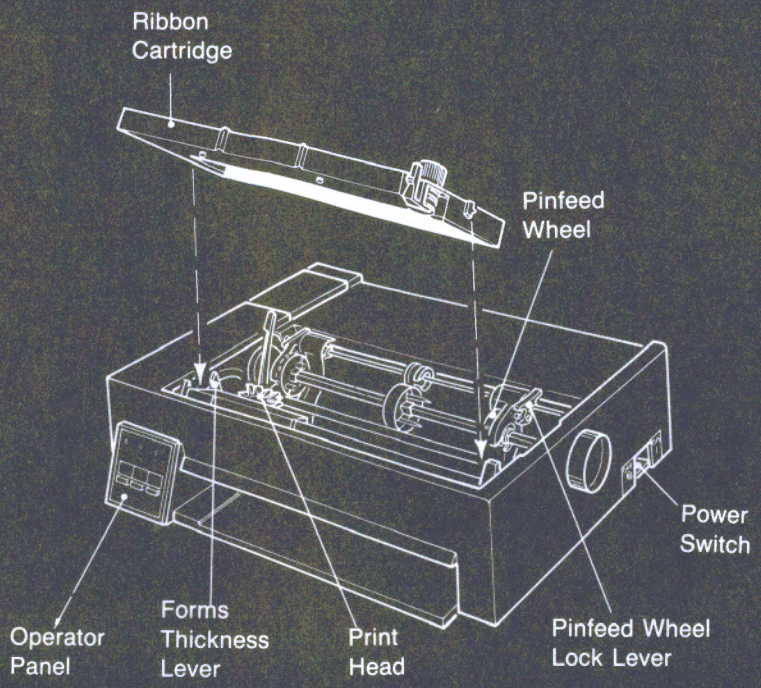
Double wide compressed and double strike

How to Identify Parts of the Printer

Use the following drawing to become familiar with your printer.






Ribbon
Cartridge
Pinfeed
Wheel
Power
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Thickness
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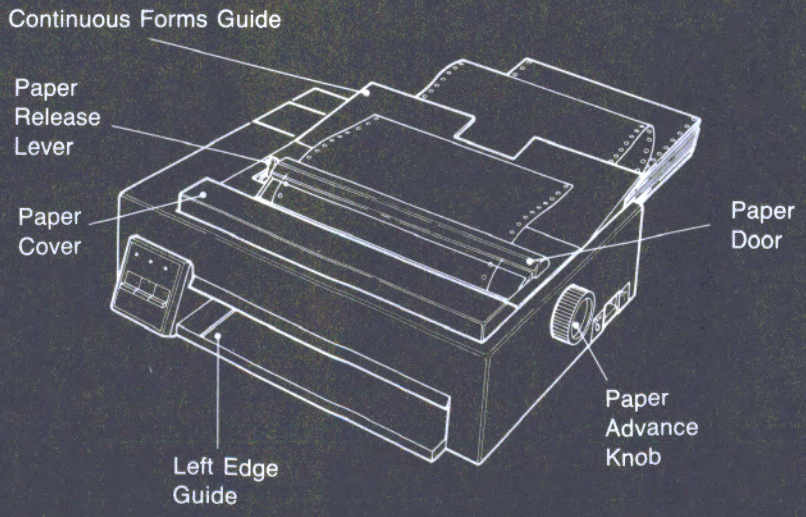
Continuous Forms Guide
Paper
Release
Lever
Paper
Cover
Paper
Door
Paper
Advance
Knob
Left Edge
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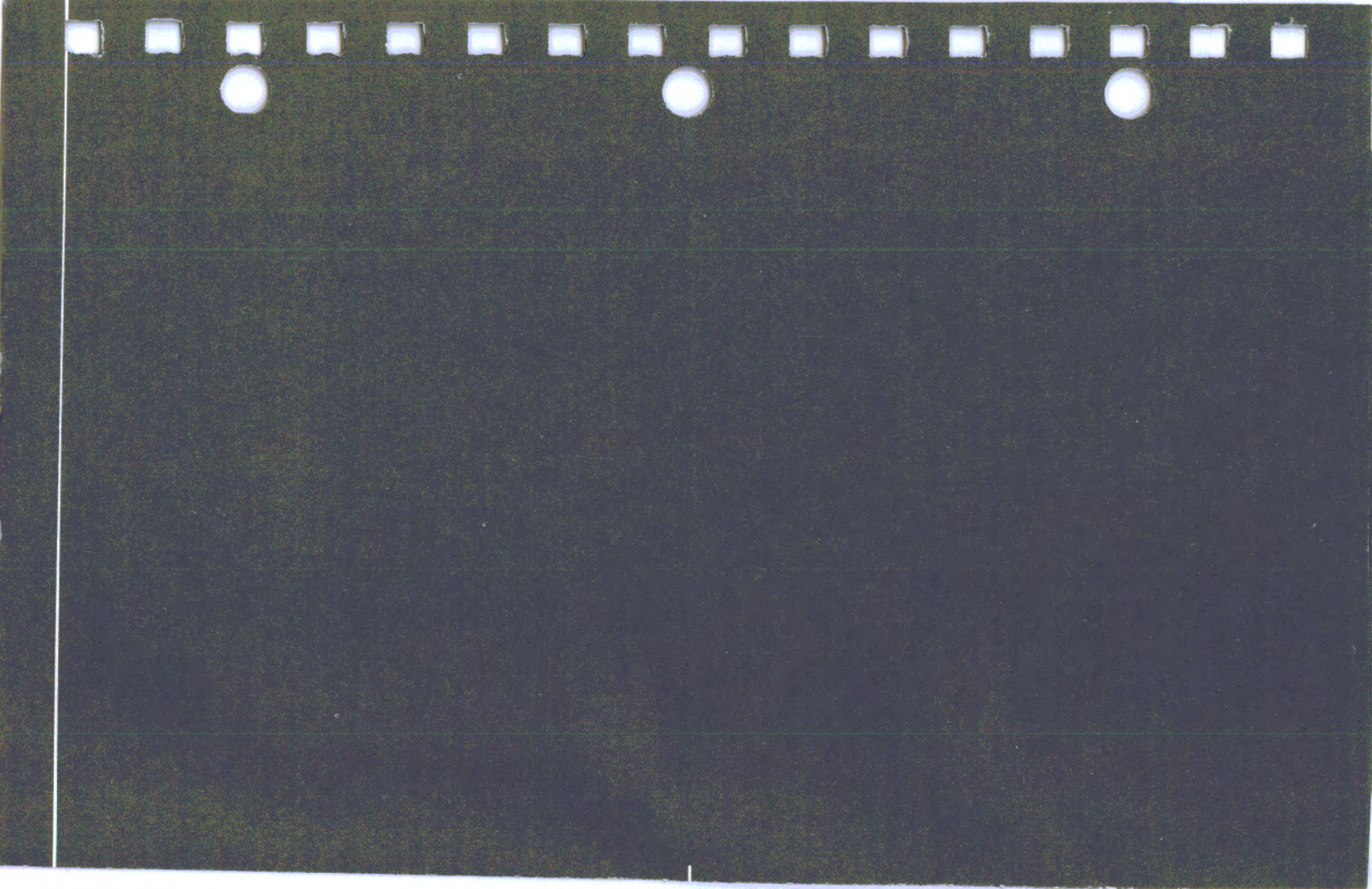

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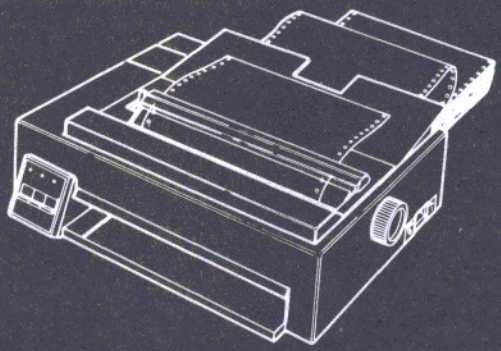
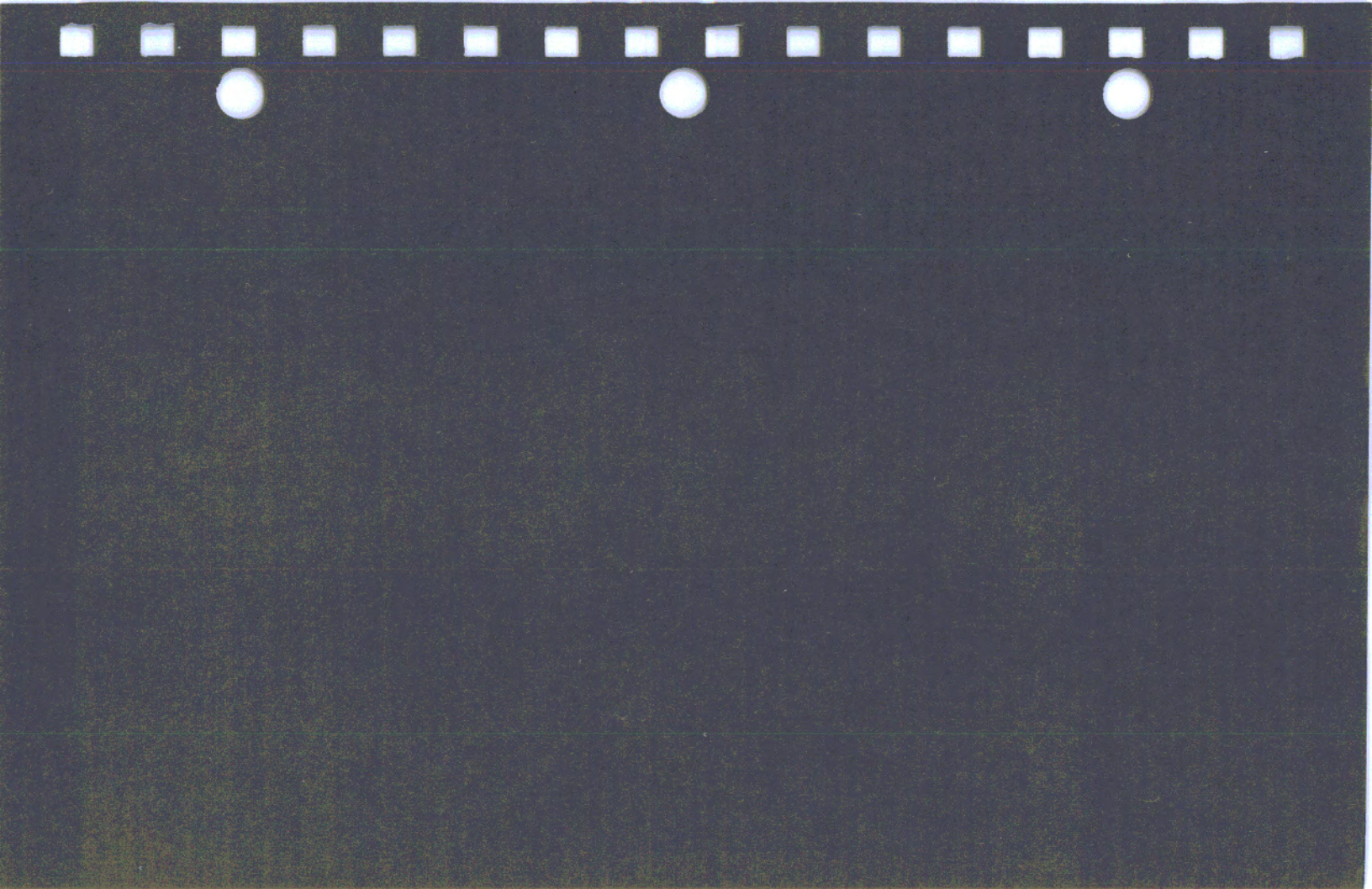
Section 2. How to Set up Your Printer





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Notes:

How to Set Up Your Printer

This section tells you how to set up your printer and checkout its operation.

Before you set up your printer, read *all* the steps from beginning to end.

Setup Requirements

> **DANGER**
> Serious shock hazards exist under the printer cover. Do not remove the printer cover.

Power Requirement: Find the power requirements label on the bottom of your printer. Ensure that the power at your wall outlet matches this label *before* you plug in your printer.

Power Plug: Your printer has a safety feature, a three-wire grounding-type plug. This plug fits only a grounding-type power outlet. If you cannot insert the plug into the outlet, contact your electrician to replace your outlet. Do not defeat the purpose of the grounding plug.

Location: To allow for air flow, do not place anything closer than 50.8 mm (2 in.) to your printer. Place the printer on a level surface.

Interface

The interface is the connecting point for your printer to your terminal or computer. The Proprinter can have two types of interfaces. The parallel interface is standard. The serial interface is optional.

Parallel Interface: Many computers have the parallel interface. To ensure your computer has a parallel printer interface, contact an IBM Authorized Dealer, an IBM Product Center, or the IBM Branch Office serving your locality.

Serial Interface: If your computer or terminal has the serial interface, contact an IBM Authorized Dealer, an IBM Product Center, or your IBM marketing representative.

Printer Cable

You need a printer cable to connect your printer to your computer or terminal. ***The printer cable does not come with your printer. Use compatible cables, or:***

Parallel Interface Cable: Use IBM Part number 1525612.

Serial Interface Cable: Use IBM Part number 8509386.

Jumper Cable: Use IBM part number 6493159.

You cannot use both cables at the same time.

Begin Here

After you have removed your printer from the carton, begin here.

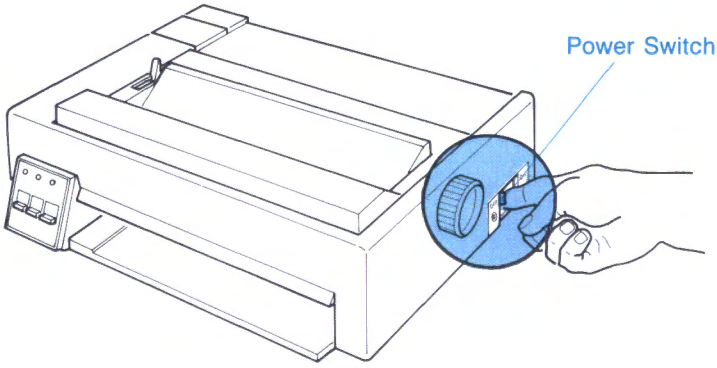
If you have a problem during setup, *first* see **"Section 5, Problem Determination Procedures."** For further help, contact an IBM Authorized Dealer, an IBM Product Center, or the IBM Branch Office serving your locality.

What to Do With the Shipping Carton

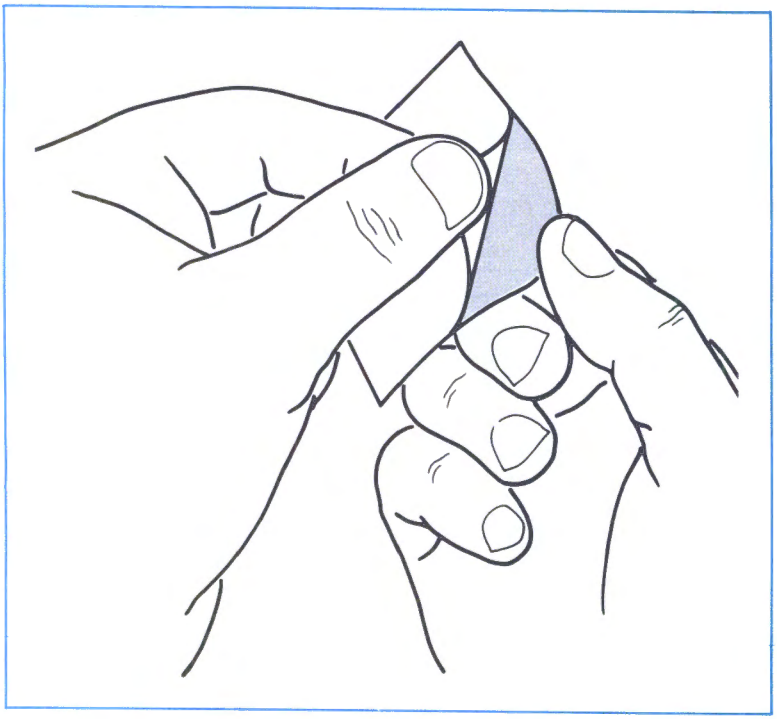
Save the shipping carton. You need this carton when you move your printer or ship the printer for service.

> **Warning:** Do not connect your printer to a wall outlet or to your computer until the step tells you.

1. Remove the plastic bag.
2. Set the printer **power switch** to **Off (O)**



3. If you are setting up the printer in a country other than the U.S., find the operator panel label for your country. Remove the peel-off backing on the label and line up the 3 *round holes* in the sticker with the 3 *lights* on the operator panel. Press the self-sticking label on the operator panel.

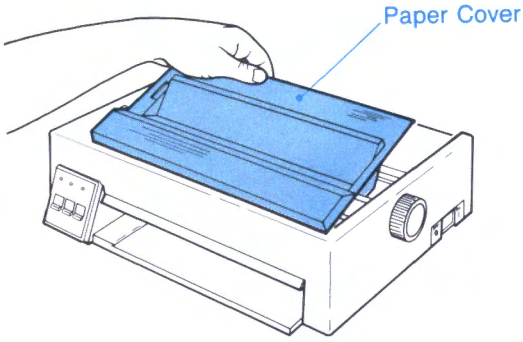


4. **Go to** the next page to install the ribbon cartridge.

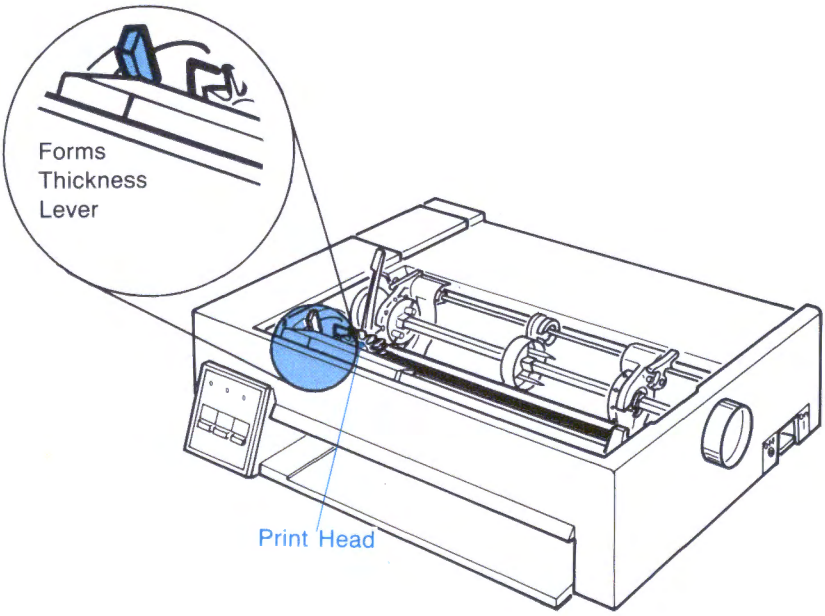
How to Install the Ribbon Cartridge

Use the following steps if you are setting up your printer or changing the ribbon. If your printer is shipped with a ribbon installed, go to "How to Insert a Sheet of Paper (for Testing)" on page 2-14.

1. Remove the **paper cover**.



2. Set the **forms thickness lever** midway between "1" and "6". (The numbers "1" and "6" are on the printer cover at the edge of the opening.)

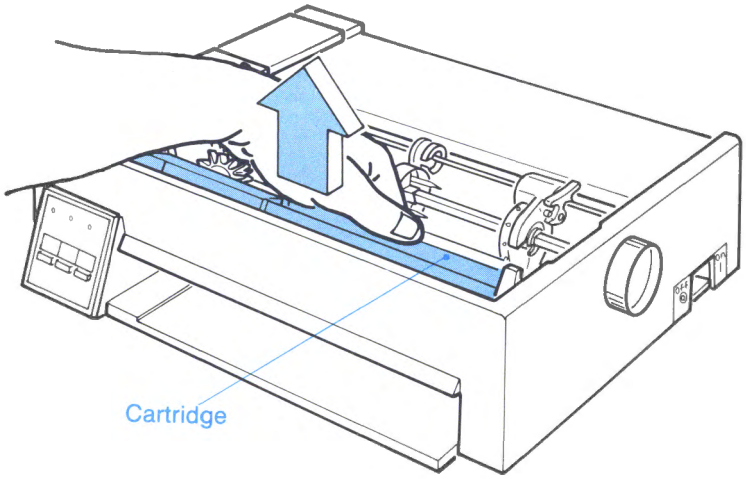


CAUTION
The print head stays hot after continuous use. Allow the print head to cool before you touch the print head.

3. Ensure the print head is all the way to the left side.

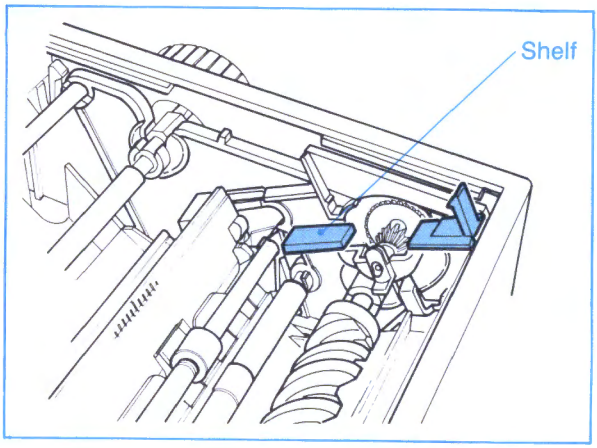
Operator Note!

If you are removing a worn ribbon, grasp the **cartridge** and lift as shown.

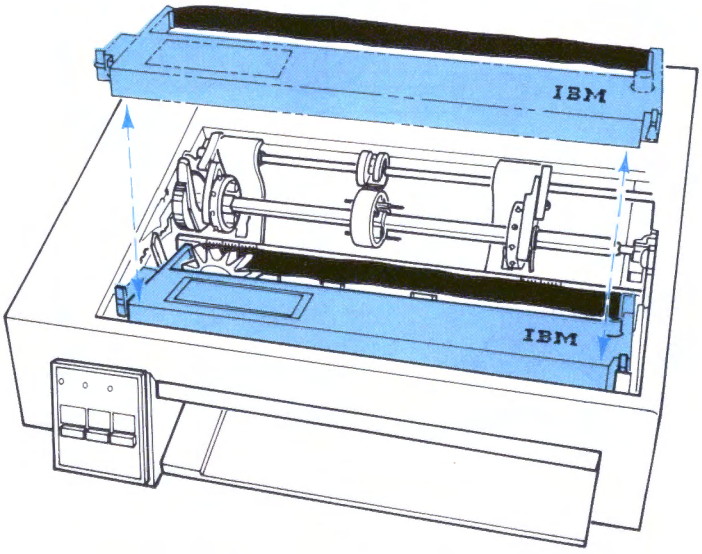


4. Get the new **ribbon cartridge**, IBM part number 6328829. The **ribbon knob** is on the *top* of the cartridge. Tighten the ribbon by turning the **ribbon knob** the same way as the arrow on the cartridge.

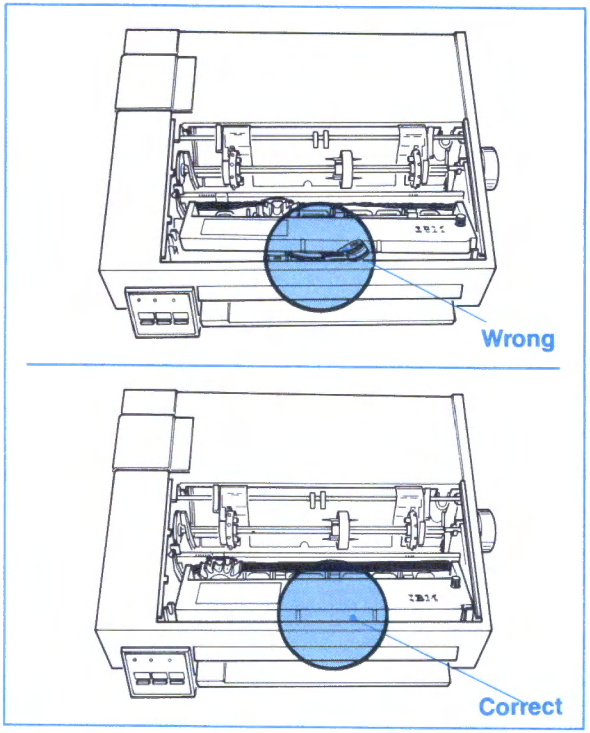
5. Look for the **shelf** in the *right* of the printer. After you install the cartridge, it sits on this shelf.



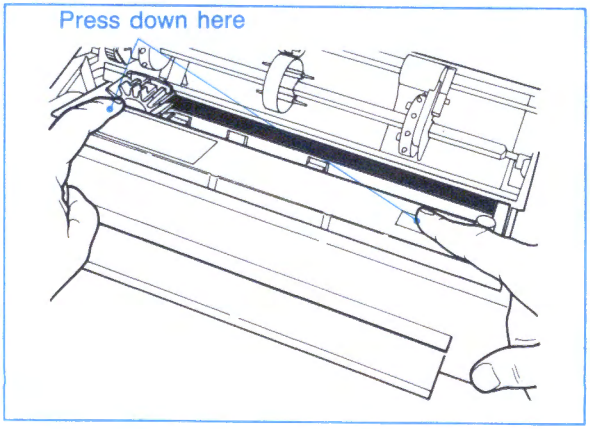
6. Put the cartridge in the printer, with the ribbon part away from you, tilting down.



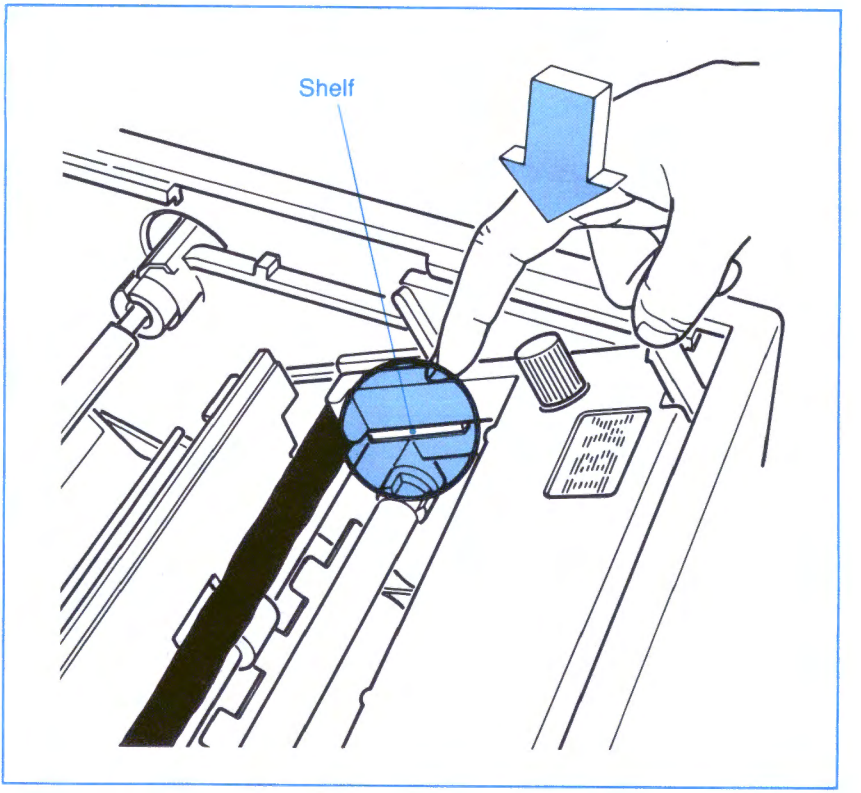
7. Ensure the long, curved, flexible strip in the printer is not pinched. The ribbon cartridge goes over the strip, and holds the strip down.



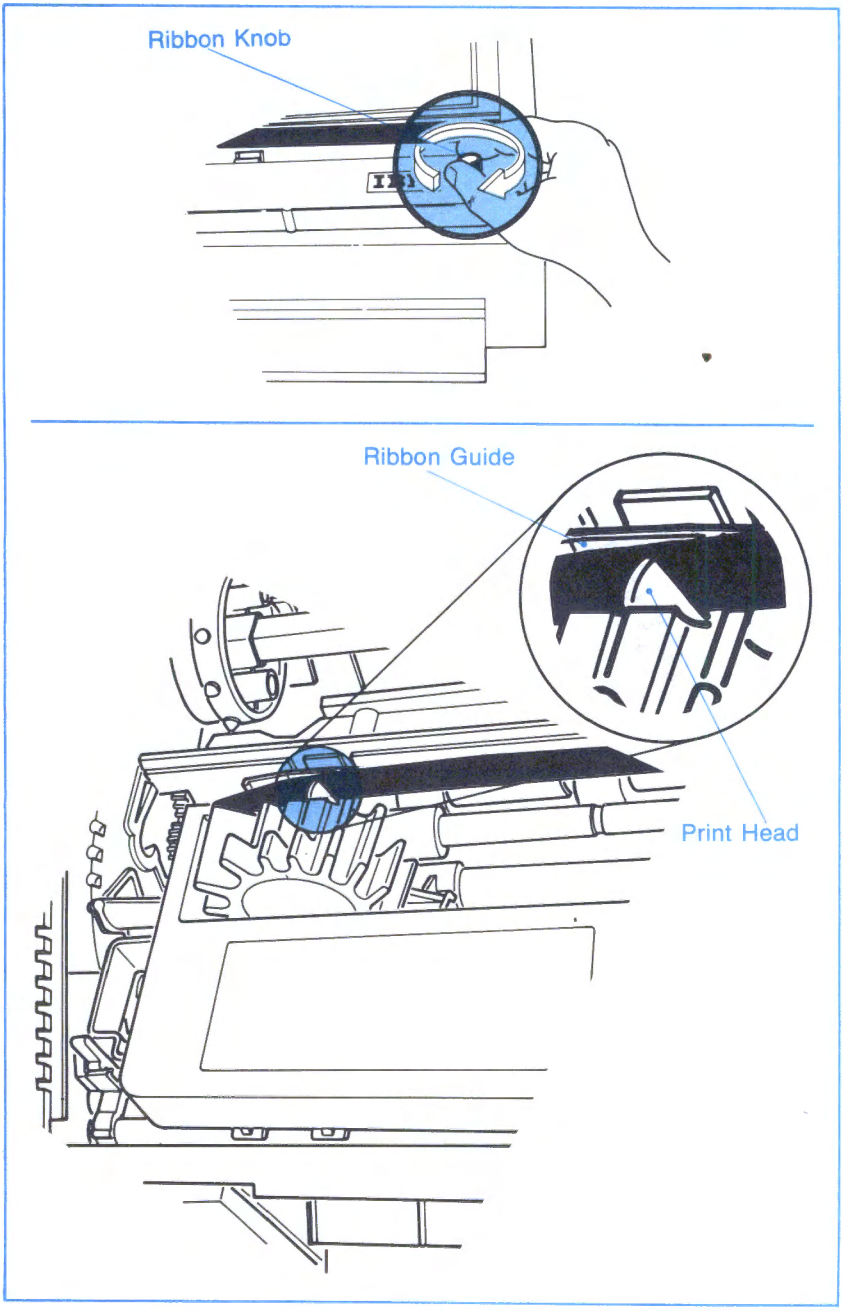
8. Press down on both sides of the cartridge.



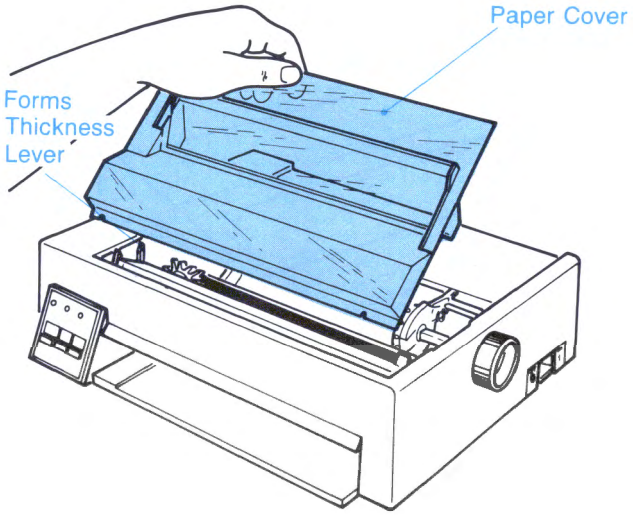
9. Ensure the *right side* of the cartridge sits on the small "shelf" in the right side of the printer.



10. Turn the **ribbon knob** several turns and ensure the **ribbon** goes *down* between the print head and **ribbon guide**.



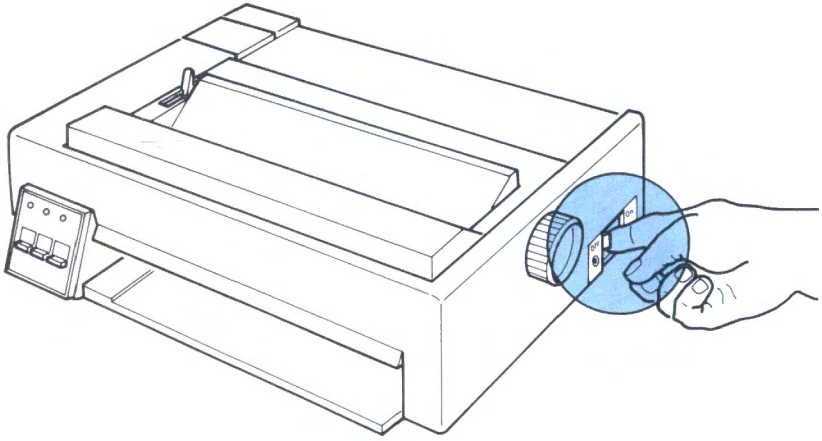
11. Put the **paper cover** on the printer.



12. **Go to** the next page.

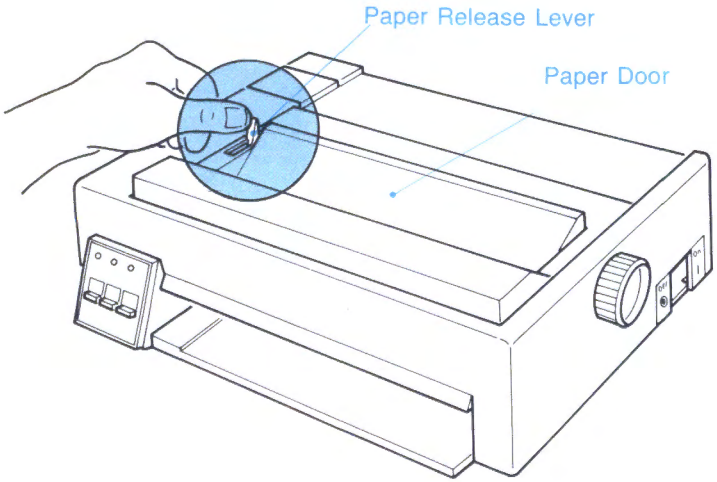
How to Insert a Sheet of Paper (for Testing)

1. Set the power switch to **Off (O)**.

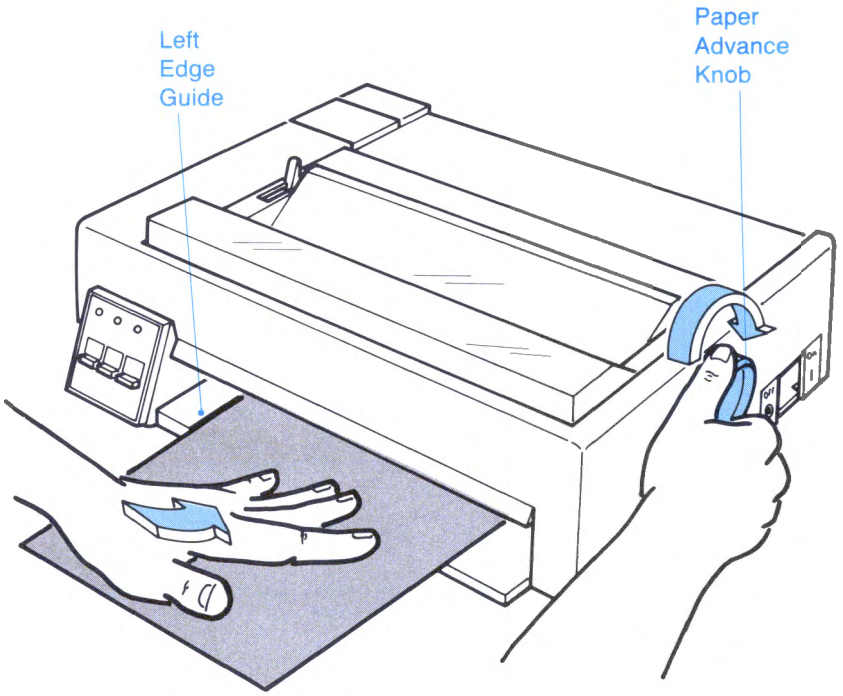


2. Ensure the **paper release lever** is toward the rear of the printer.

3. Flip the **paper door** toward you, so you can see the numbered scale.



4. Get a sheet of paper at least 203.2 mm (8.0 in) wide. Slide the sheet of paper (the printing occurs on the front side) straight into the front opening, in line with the **left edge guide** until the paper stops.



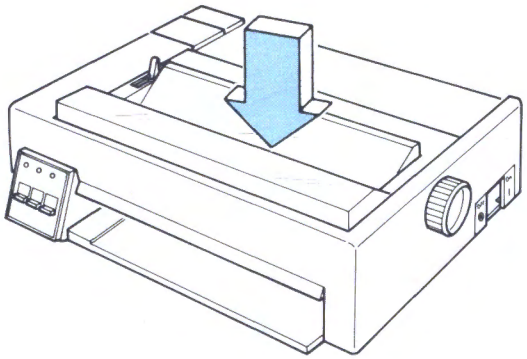
5. Watch for the paper to move up as you turn the **paper advance knob** as shown above.

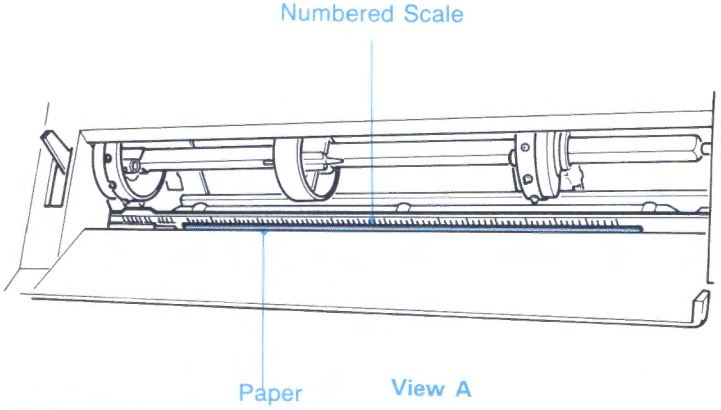
6. Use the bottom of the **numbered scale** as a guide.

Operator Note!

When you place the top **edge** of the form at the bottom of the **numbered scale**, printing starts 12.7 mm (0.5 in.) from the top **edge** of the form.

View A



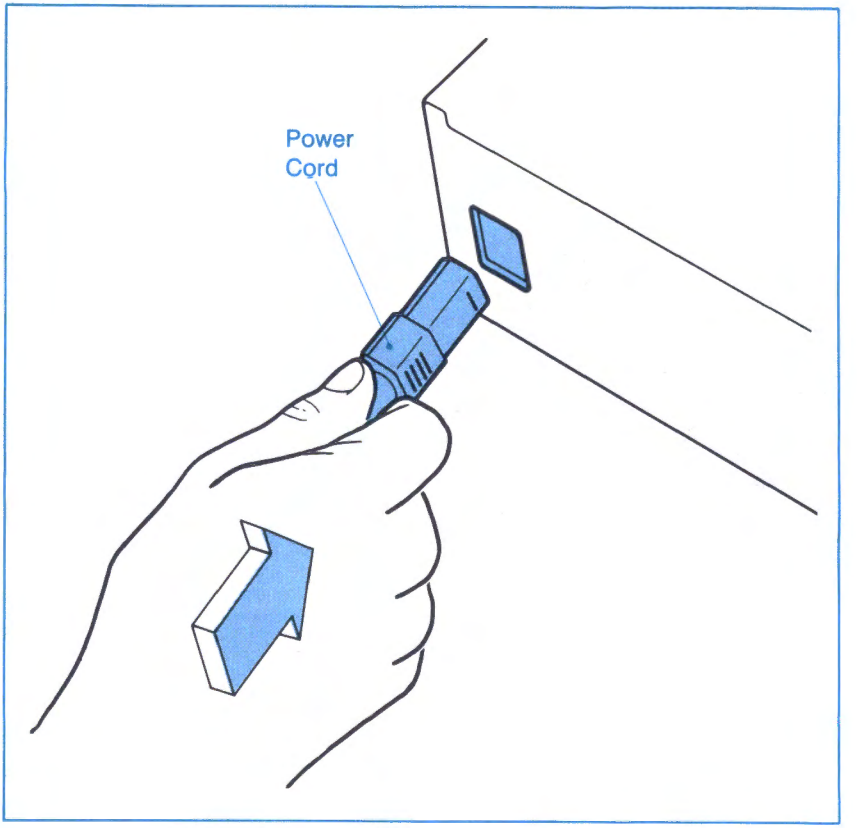


View A

7. Close the paper door.
8. **Go to** the next page.

How to Install the Power Cord

1. Go to the rear of the printer and connect the smaller end of the power cord. Use firm hand pressure to push the connector in.



2. Plug the larger end of the power cord into a properly grounded wall outlet. To check out your printer, **go to** the next page.

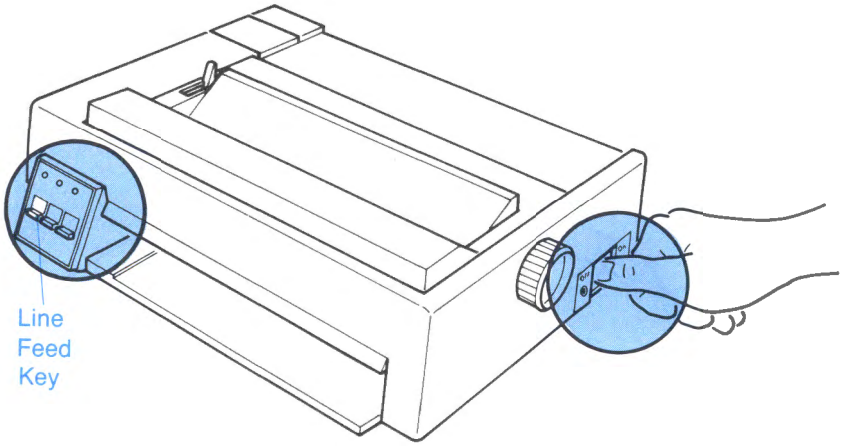
Printer Check Out

To see if your printer works correctly, **do the following steps.**

How to Test the Printer (Self-Test)

1. Press and hold the **Line Feed** key while you set the power switch to **On** (|).

2. Release the **Line Feed** key when printing starts.



3. Ensure your printout looks like this:

```
62552667 COPYRIGHT IBM CORP 1984,1985
 !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHI
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJ
"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJK
#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKL
$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLM
%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMN
&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNO
'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOP
()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQ
)*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQR
*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRS
+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRST
,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTU
```

The printer continues to print the test pattern until you switch the printer off or the paper runs out. If the printing is too light, adjust the **forms thickness lever**. See "Forms Thickness Lever" on page 3-11.

Warning: If the form thickness lever is moved to a lower setting than is necessary for satifactory printing, **damage** to the print head and ribbon may occur.

If your printout is as shown above, your printer is ready for use.

How to Stop the Self-Test

To interrupt the test, press the **Online** key.

> **Operator Note!**
>
> After you press the **Online** key, the self-test stops *after* a complete line of characters print.
>
> To run the complete self-test on *continuous* forms, ensure you have at *least* five sheets *before* you start the self-test.

To continue the test pattern, press the **Online** key.

To end the test, switch the printer power off.

Printer setup is complete.

See "How To Connect the Cable" on page 2-21.

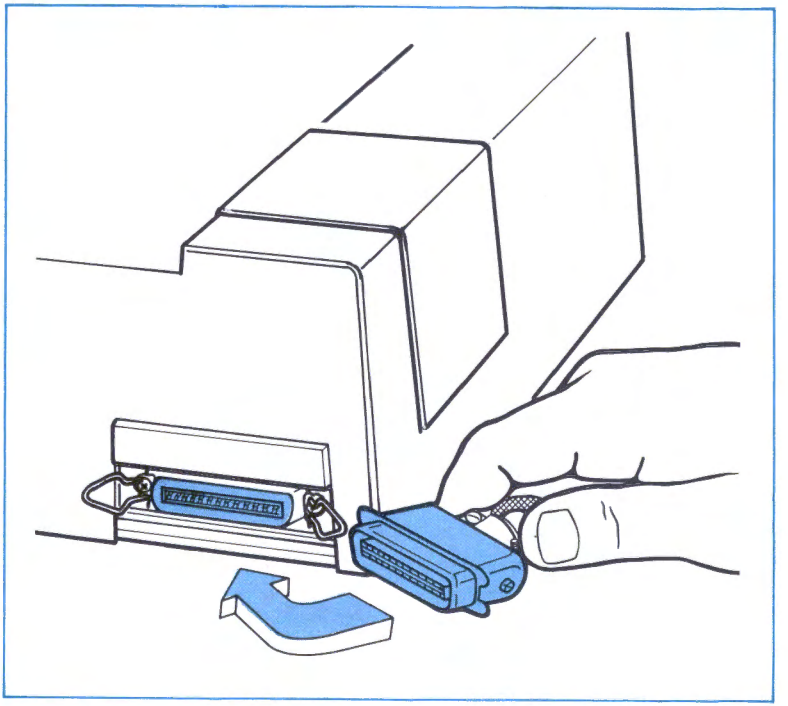
If you need additional help with setup or operation, contact an IBM Authorized Dealer, an IBM Product Center, or the IBM Branch Office serving your locality.

What to Do If the Printer Does Not Operate Correctly

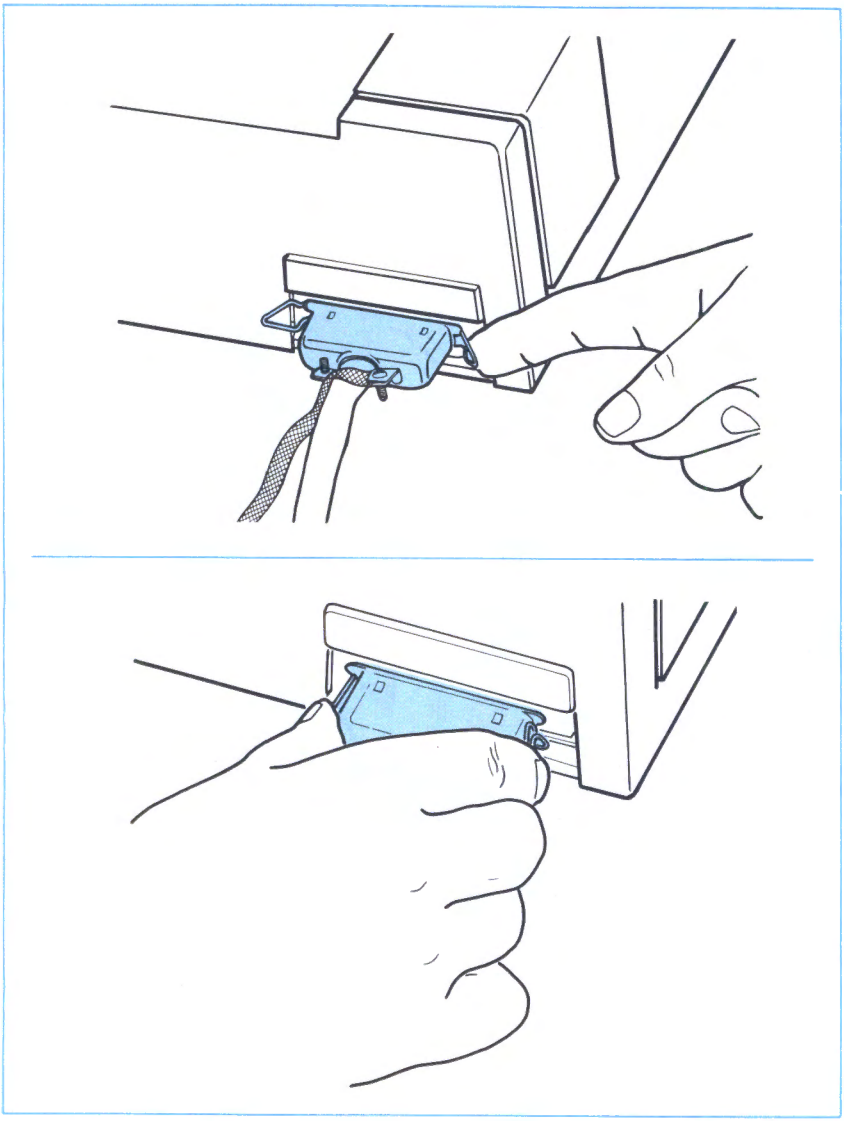
If you have any problems, see "Problem Determination Procedures" on page 5-1.

How to Connect the Cable

1. Set the printer **power switch** to off.
2. Set your computer or terminal power switch to off.
3. Connect the parallel interface cable (IBM part number 1525612 or other compatible cables) as shown. Ensure that you fully press the plug into the printer connector. You do not need to attach the ground wire on the printer cable.



4. Move both clips over the edge of the plug until you hear a "click."

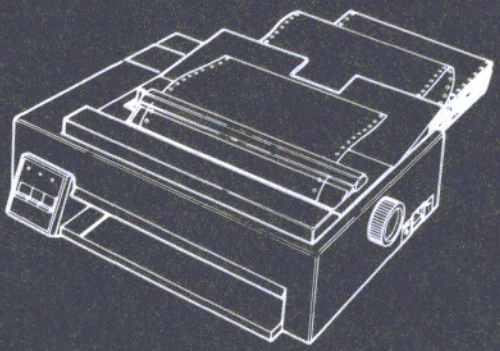


5. Connect the other end of the printer cable to your computer or terminal. Use your computer or terminal instructions to attach the printer cable.

6. Your Proprinter is ready to use.

3

Section 3. How to Operate Your Printer



3

Section 3. How to Operate Your Printer

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Notes:

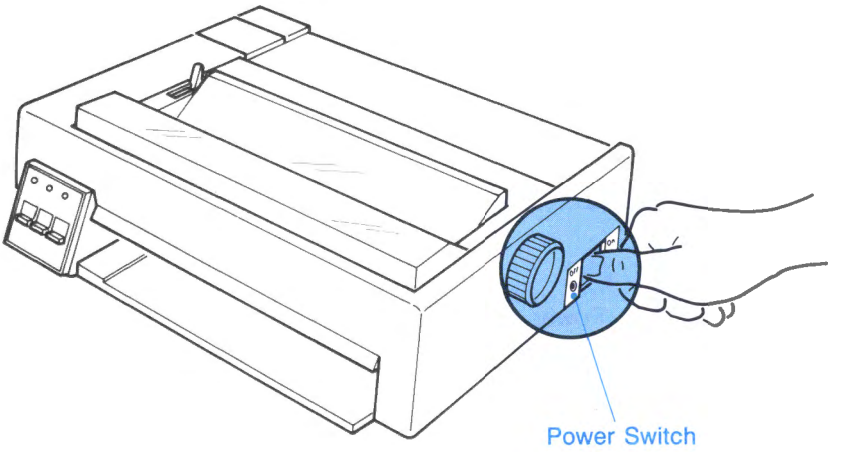
How to Operate Your Printer

This section tells you:

- How to get your printer ready to print
- What the lights and keys mean.

How to Switch the Printer On

To switch the power on, set the printer **power switch** to **On** (|).



Operator Note!

| is the international symbol for On.

O is the international symbol for Off.

What Happens When You Switch the Power On

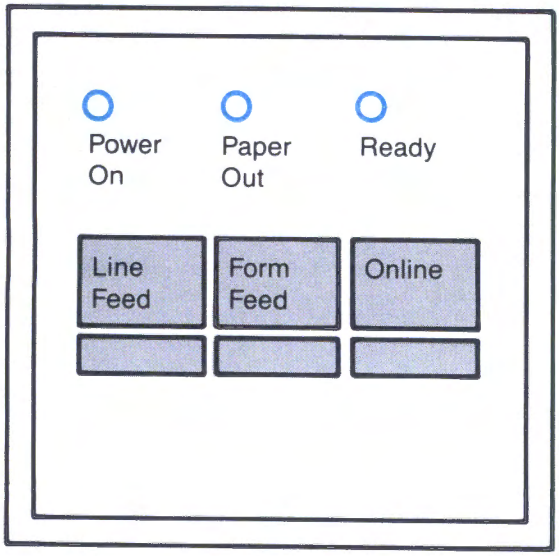
Operator Note!

Interference may occur on the display if the printer is placed to the left side of the display. If this occurs, increase the distance between the printer and the display.

When you set the power switch to **On** (|), the **Power On** and **Ready** lights each come on (forms must be in the printer). Also, the **print head** moves to the left. Built-in tests check the printer and the printer resets the **top of form**.

Printer Lights

Look at the three lights on the operator panel.



What the Lights Mean

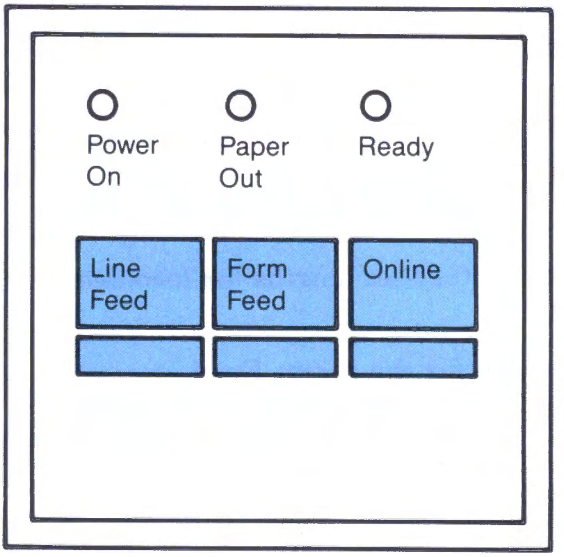
The **Power On** light is on when the printer power is on.

The **Paper Out** light comes **on** when the printer detects the end of forms. The **Paper Out** light *stays on* until you put paper in the printer, *and* press the **Online** key. The **Paper Out** light and the **Ready** light ***blink alternately*** if the printer has an error. If you have any problems, see "Problem Determination Procedures" on page 5-1.

The **Ready** light is on when the printer is ready to receive information for printing.

Control Keys

Look at the three keys on the operator panel.



What the Keys Do

The **Online** key turns the **Ready** light on and off. When the **Ready** light is on, the computer controls your printer, and the printer is ready to receive print data. Press the **Online** key once to place the printer offline (**Ready** light is off). Press the **Online** key once *again* to place the printer online (**Ready** light is on).

When the **Paper Out** light is on, you have to put paper in the printer. *After* you put paper in the printer, press the **Online** key *once*. This turns on the **Ready** light, sets the **top of form**, and turns the **Paper Out** light off.

To move the paper to the next **top of form**, press the **Form Feed** key. The **Ready** light must be off for the **Form Feed** key to operate.

Use the **Form Feed** key to feed a new cut sheet when the **Paper Out** light is on.

To move the paper to the next line on the form, press the **Line Feed** key. When you hold down the **Line Feed** key, the paper continues to move until you stop pressing the key. The **Ready** light must be off for the **Line Feed** key to operate.

The **Line Feed** key also starts the printer self-test. See "How to Test the Printer (Self Test)" on page 2-18.

Operator Note!

The printer has factory-set lengths for form feed and line feed.

The factory setting for the **Form Feed** key is 279.4 mm (11 in.) for the U.S. and Canada and 304.8 mm (12 in.) for all other countries. The factory setting for the **Line Feed** key is 6 lines per inch. This means unless the printer is under program control the factory-set lengths will be the default values.

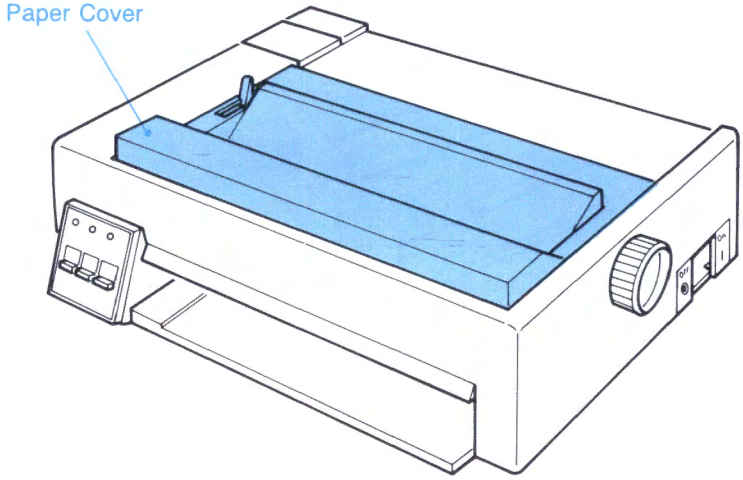
You can change the lengths with printer control codes or a switch described later in this guide. See **"Section 4, Printer Control Codes and Escape Sequences"** and See "How to Change a Switch Setting" on page 6-4 for additional information.

Paper Cover

The **paper cover** is on the top of your printer. You lift and remove this cover *before* you put continuous forms in your printer or change the ribbon cartridge. *After* you change the ribbon cartridge or install continuous forms, replace the paper cover.

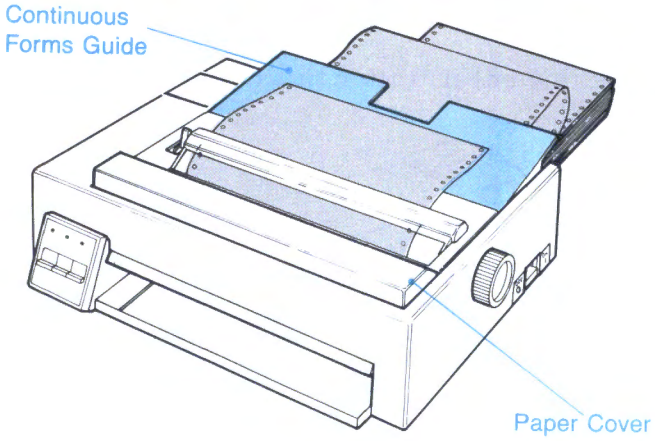
Keep the paper cover on the printer while using continuous forms.

Continuous forms **enter under** this cover.



Continuous Forms Guide

Use the **continuous forms guide** for continuous forms. You may leave the **continuous form guide** in place while you use cut forms. The **paper cover** holds the **continuous forms guide** in place. Blank continuous forms enter the printer *under* this guide. Printed continuous forms leave the printer *over* this guide.



Continuous Forms

Continuous forms have pinfeed holes on either side of the paper. Continuous forms feed into the *top* of the printer.

Cut Forms

Cut forms are sheets of paper, like sheets of stationery. Cut forms feed into the *front* of the printer.

Controls

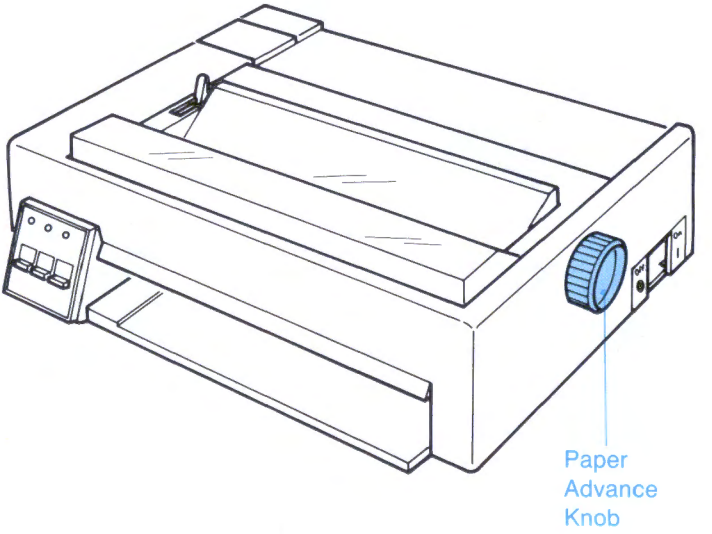
Paper Advance Knob

Use the **paper advance knob** to:

- To move the paper
- To add or change paper.

Operator Note!

Turn the **paper advance knob** only while the **Ready** light is off.



Paper Release Lever

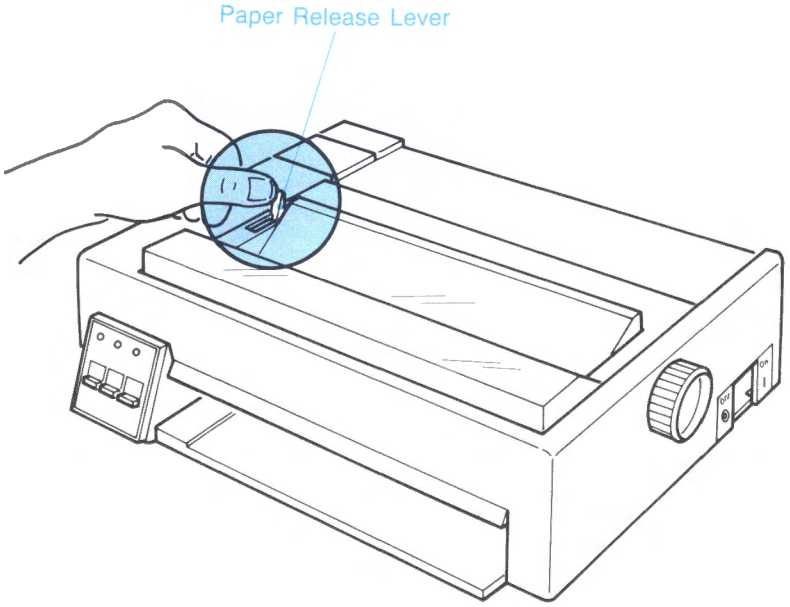
Where to Find the Paper Release Lever

The **paper release lever** is on the top edge of your printer, at the left side.

How to Adjust the Paper

The **paper release lever** allows you to adjust the paper. Move the lever toward the front of the printer to release the paper.

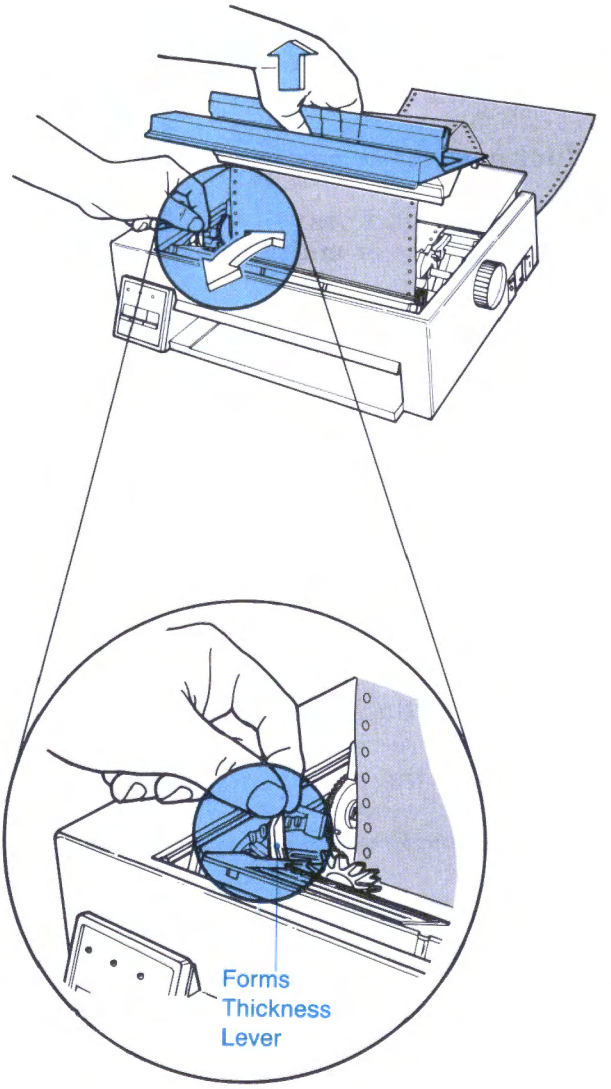
Move the **paper release lever** toward the rear of the printer (normal place) before printing begins.



Forms Thickness Lever

Where to Find the Forms Thickness Lever

The **forms thickness lever** is *under* the **paper cover**, on the left side of your printer.



What the Numbers Mean

The numbers "1" through "6" (on the printer cover) are for reference only. The numbers do not mean the number of copies in the forms you are using.

How to Adjust the Printer for Different Forms

To adjust the **forms thickness lever**, remove the paper cover. Put the paper cover back on the printer after you adjust the **forms thickness lever**.

The **forms thickness lever** moves the print head to:

- Adjust the printing darkness
- Adjust for single-copy or multiple-copy forms.

Move the lever toward "1" for single-copy forms. Move the lever toward "6" for multiple-copy forms.

Operator Note!

Each time you put paper in the printer, *always* start with a higher-numbered setting, and then slowly move the **forms thickness lever** toward "1" until the printing is satisfactory.

Warning: If the form thickness lever is moved to a lower setting than is necessary for satisfactory printing, **damage** to the print head and ribbon may occur.

Printing Too Dark or Too Light

The forms thickness lever adjusts print darkness. If the printing is too light, move the lever toward "1." If the printing is too dark or smudges, move the lever toward "6."

How to Put Forms in Your Printer

Use this section for putting forms in your printer.

> **Operator Note!**
>
> Each time you put paper in the printer *always* check the **forms thickness lever** setting. See "Forms Thickness Lever" on page 3-12.

Types of Forms

The printer uses either cut forms or continuous (fan-fold) single-copy or multiple-copy (up to four-part) forms. (Four-part forms have an original and three copies.)

Cut Forms Specifications: Cut forms can be from 76.2 mm (3 in.) to 279.4 mm (11 in.) wide and not less than 76.2 mm (3 in.) long. If your forms length is 304.8 mm (12 in.), set switch 4 on. See "How to Change a Switch Setting" on page 6-4.

Continuous Forms Requirements: Continuous forms can be from 76.2 mm (3 in.) to 254 mm (10 in.) wide, including pinfeed holes.

> **Operator Note!**
>
> If your program requires printing within the last (bottom) 12.7 mm (0.5 inch) of the form, attach a trailer to the *bottom* edge of the form.
>
> During conditions of extreme temperature or humidity, you may have to monitor the feeding of multle-part forms.

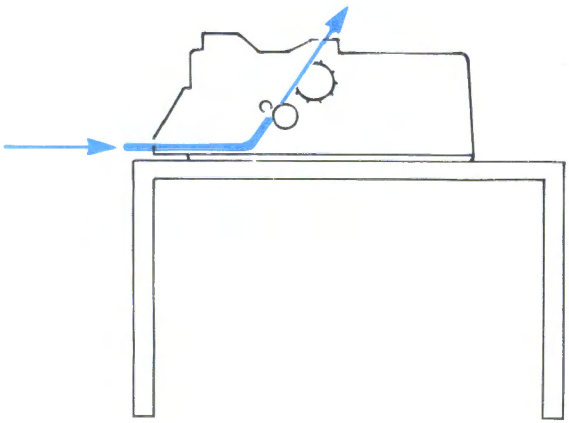
WARNING: When you use labels, envelopes or thick forms, avoid moving the forms in reverse. The envelopes or thick forms can jam in the printer or damage the print head. See "How To Clear a Paper Jam" on page 5-17.

Operator Note!

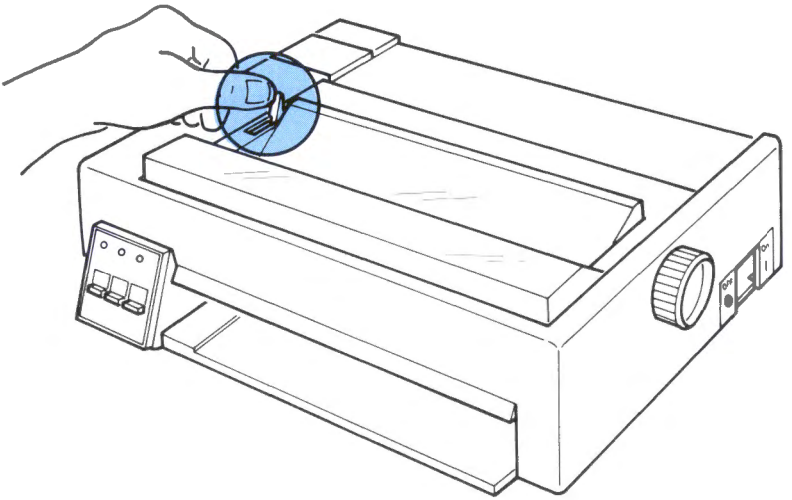
Prior to inserting an envelope, set the **Forms Thickness Lever** to "3" or higher. Then, adjust the **Forms Thickness Lever** until you obtain a satisfactory print.

Operator Note!

One-part continuous forms can remain in the printer while you use cut forms or envelopes *of the same width or narrower* than the continuous forms. The continuous forms still move through the printer. However, you can remove the continuous forms to save paper. The **Paper Out** light does not come on at the end of a cut form, when running with continuous forms. If you have more printing than will fill the cut form, the printing will continue on the continuous forms.



1. Ensure the **paper release lever** is toward the rear of the printer.

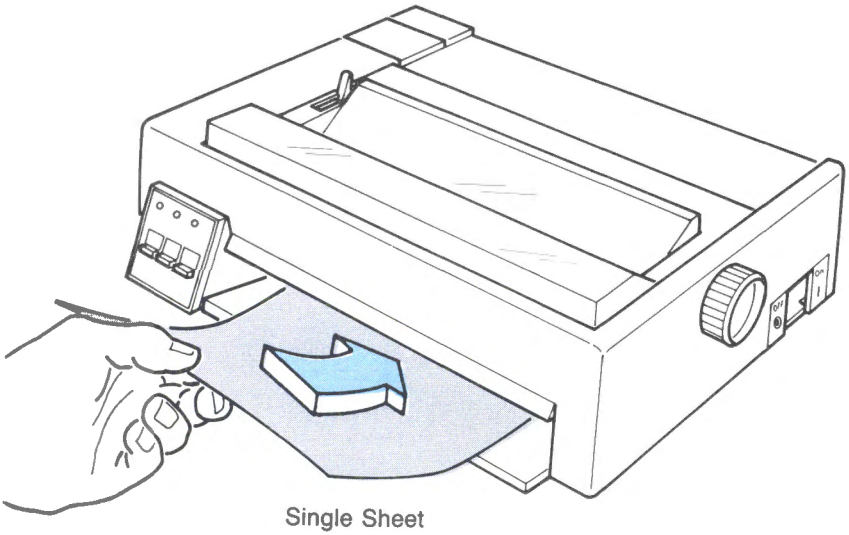


2. Slide the sheet of paper straight into the front opening until you feel the paper stop moving.

Operator Note!

For 215.9 mm (8.5 in.) wide paper (or narrower), insert the sheet in line with the **left edge guide** in the bottom of the opening.

For paper between 215.9 mm (8.5 in.) and 279.4 mm (11 in.) wide, insert the sheet against the **left side** of the opening.

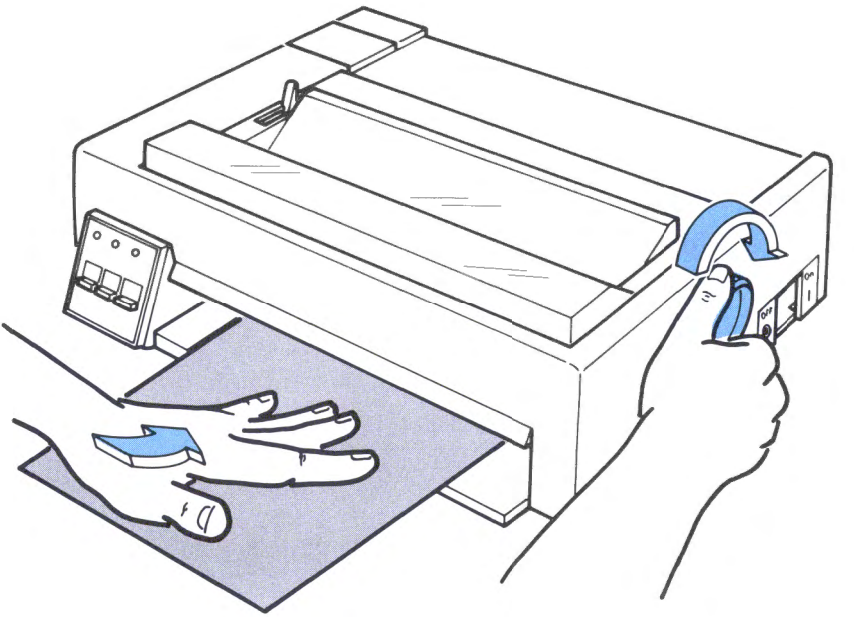


Single Sheet

3. If the printer power is ***on***, press the **Online** key (to turn off the **Ready** light). Press the **Line Feed** key or turn the paper advance knob to move the paper up.

   If the **Paper Out** light is on, press the **Form Feed** key. The printer moves the cut form to the top print line on the form.

If the printer power is ***off***, turn the **paper advance knob** as shown.



4. To adjust the paper or set the left margin (if necessary), **go to** the next page.

5. See "How to Set the Top of Form" on page 3-28.

How to Set the Left Margin on Cut Forms

The **numbered scale** shows where each character prints at 10 CPI.

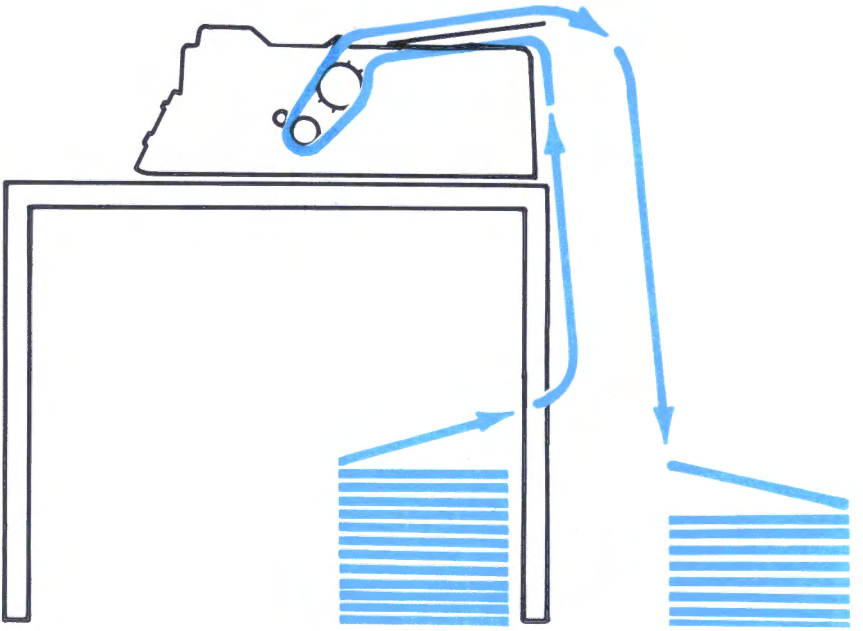
The **"0"** on the scale shows where printing starts on a line of printing.

1. Move the **paper release lever** toward the front of the printer.
2. Open the **paper door**.
3. Adjust the paper sideways, using the **numbered scale** as a guide.
4. Before you start printing, push the **paper release lever** toward the rear of the printer.
5. See "How to Set the Top of Form" on page 3-28.

How to Install Continuous Forms

Operator Note!

When you use labels, envelopes or thick forms, avoid moving the forms in reverse. The labels, envelopes, or forms can jam in the printer or damage the print head. See "How To Clear a Paper Jam" on page 5-17. Move the **forms thickness lever** toward "6" before you install forms.

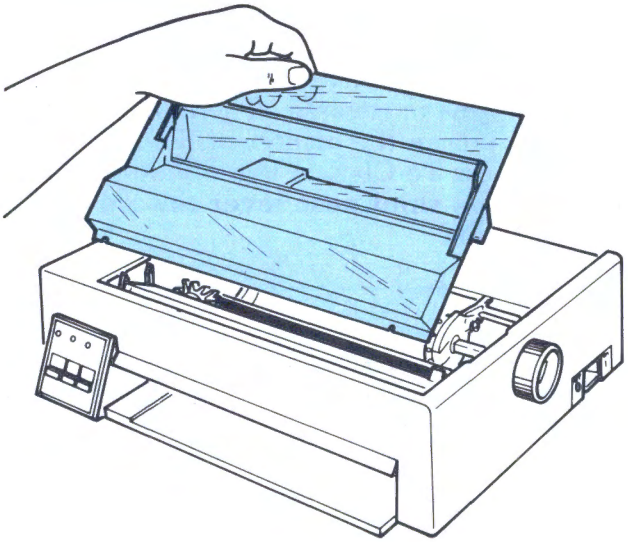


See illustration above for recommended paper feed path.

1. Set the printer **power** switch to **Off (O)**.

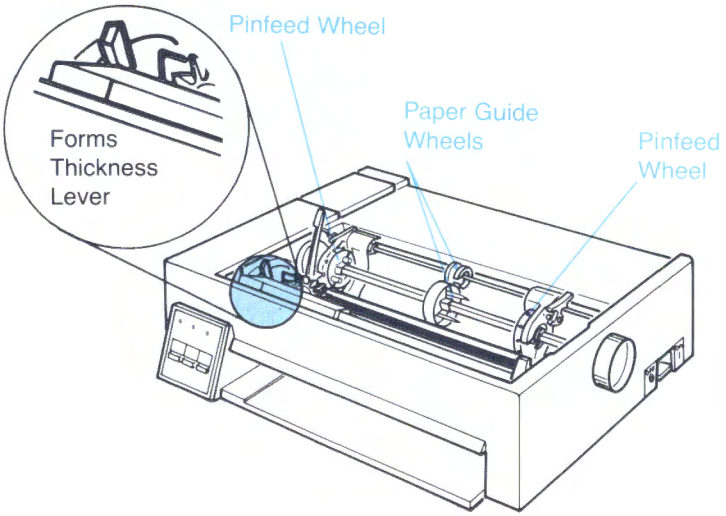
2. Before you install continuous forms, fan the forms to loosen the sheets. Place your stack of **forms** directly behind, or below the printer. Do not let the forms rub against anything, including the printer cable.

3. Remove the **paper cover**.



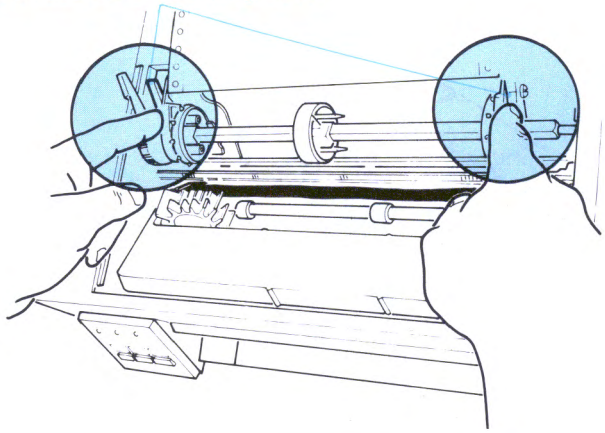
4. Move the **forms thickness lever** toward "6."

5. Slide both **paper guide wheels** to the middle, between each **pinfeed wheel**.

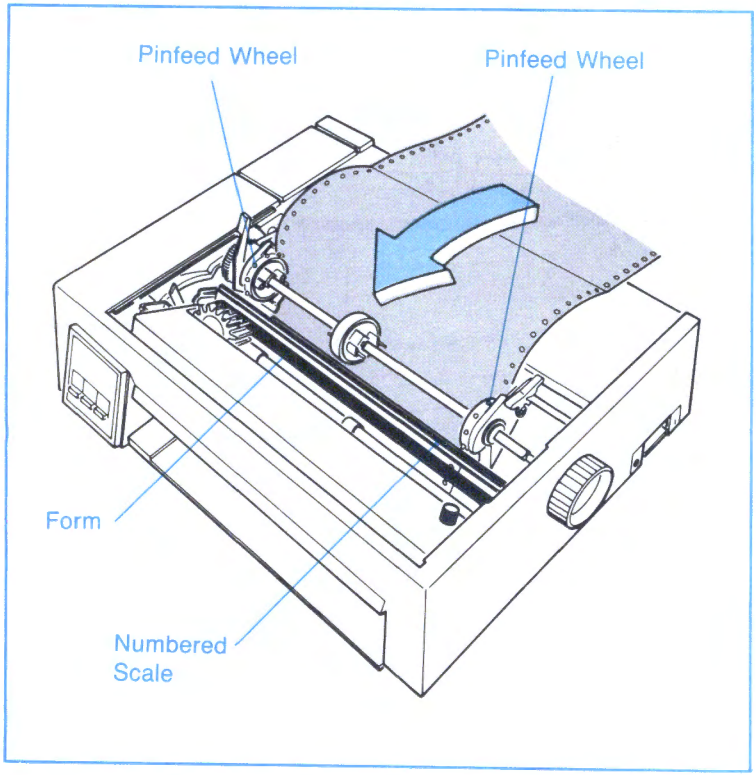


6. Tilt the locking levers toward the front of the printer. Slide the **pinfeed wheels** so that they line up with the holes in the form. Lock both pinfeed wheels in place by tilting the locking levers toward the rear of the printer.

Pinfeed Wheel Locking Lever



7. Place the paper *directly behind* each **pinfeed wheel**. Turn the **paper advance knob** a small amount until the **pinfeed wheels** go in the holes at each side of the paper. Ensure the form is straight in the printer. Turn the **paper advance knob** until you can see the *top edge* of the form move up to the numbered scale.

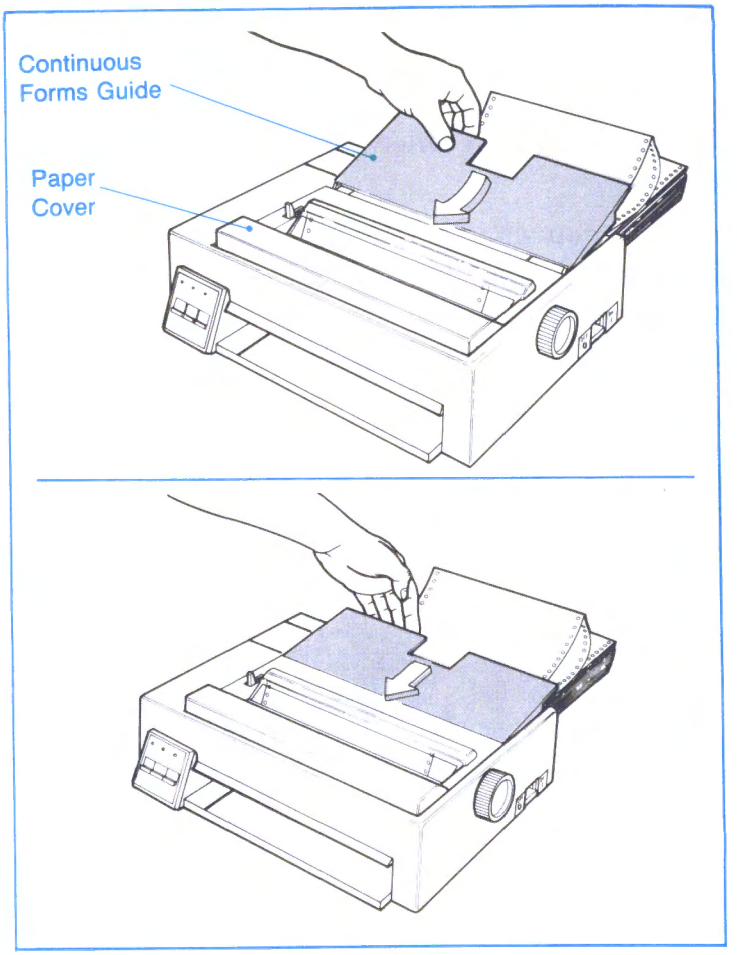


Operator Note!

For some forms, fold over the first sheet to help you feed the paper into the top of the printer.

8. Install the paper cover.

9. Install the continuous forms guide *over* the blank forms. The **paper cover** holds the guide in place.



10. If you have to change the left margin, **go to** the next page.

    If you *do not* have to change the left margin, set the **top of form**. See "How to Set the Top of Form" on page 3-28.

How to Set the Left Margin on Continuous Forms

To adjust the **pinfeed wheels**, use the following steps.

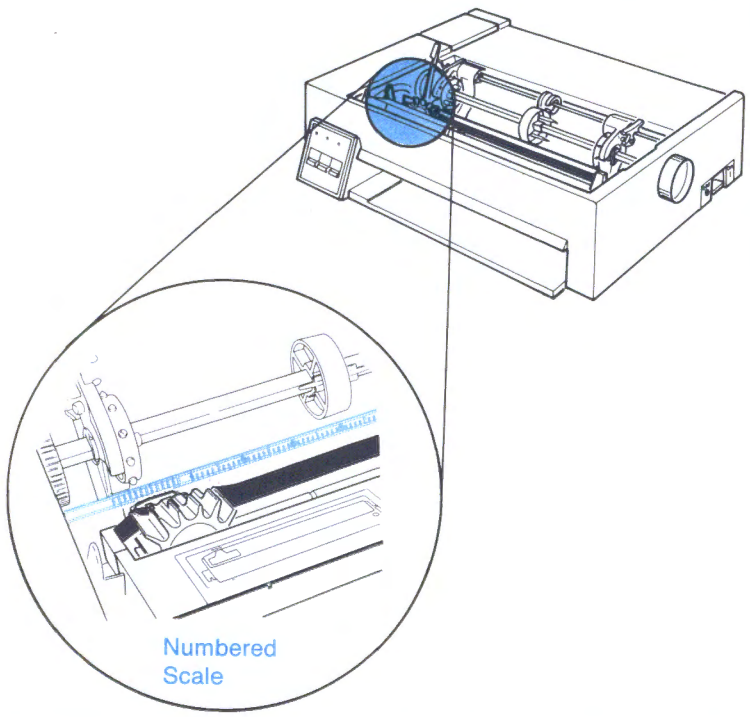
The **numbered scale** shows where each character prints at 10 CPI.

The **"0"** on the scale shows where printing starts on a line of printing.

1. Decide where you want to have your printing begin. Use the "0" on the scale as a starting point.

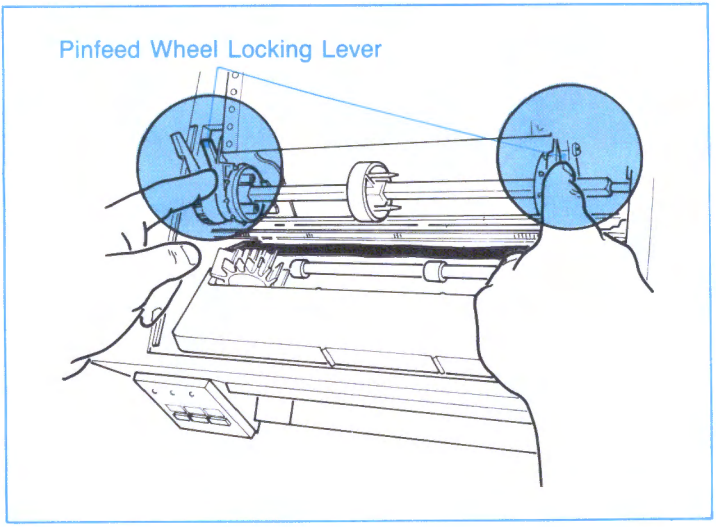
Warning: To prevent damage to the print head:

- Do not print over the pinfeed holes
- Do not print off the edge of the paper.

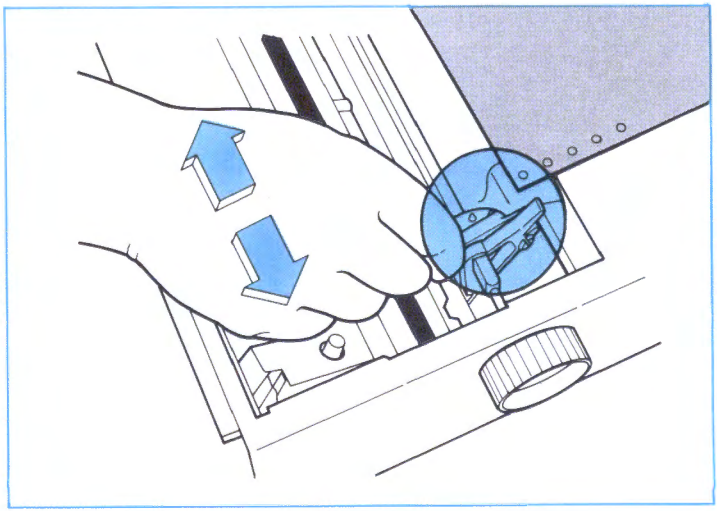


2. Move the **paper release lever** toward the front of the printer.

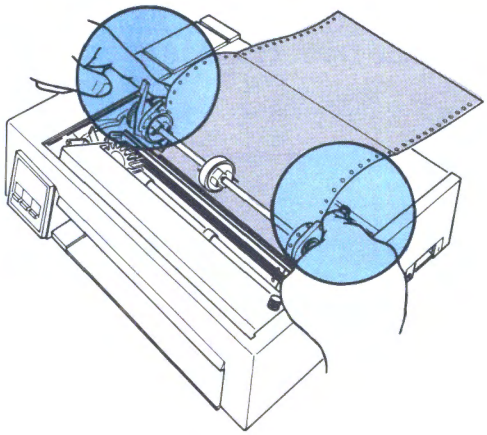
3. Unlock both pinfeed wheels by tilting the locking levers toward the front of the printer.



4. Slide the pinfeed wheels, with the paper in place, to where you want the paper. Set the pinfeed wheels so the paper is flat between them.

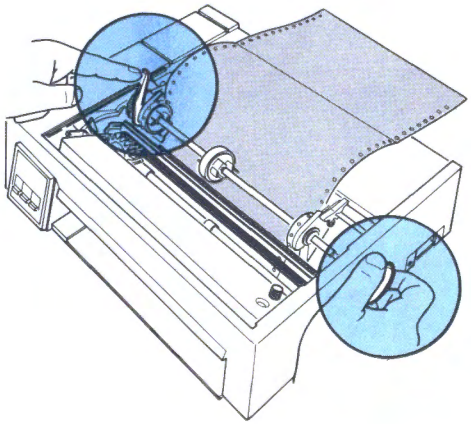


5. Lock both pinfeed wheels in place by tilting both locking levers toward the rear of the printer.



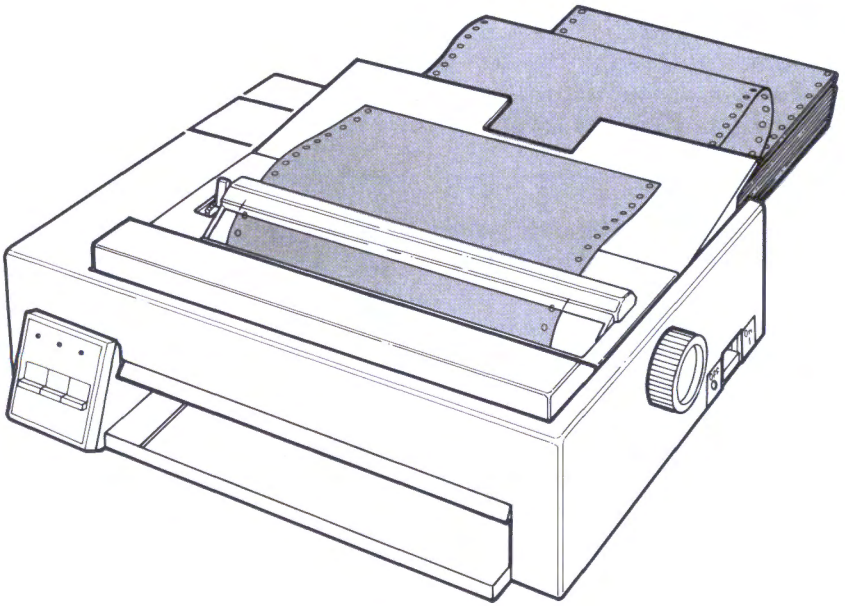
6. Move the **paper release lever** toward the rear of the printer.

> **Operator Note!**
>
> When you place the top **edge** of the form at the bottom of the **numbered scale**, printing starts 12.7 mm (0.5 in.) from the top **edge** of the form.



7. Put the **paper cover** back on the printer. Your printer is now ready to print. The printed forms pass through the paper cover **opening**.

> **Operator Note!**
>
> If the printing is too light, adjust the **forms thickness lever**. See "Forms Thickness Lever" on page 3-11.



8. Set the **top of form**. **Go to** next page.

How to Set the Top of Form

Before Power is On

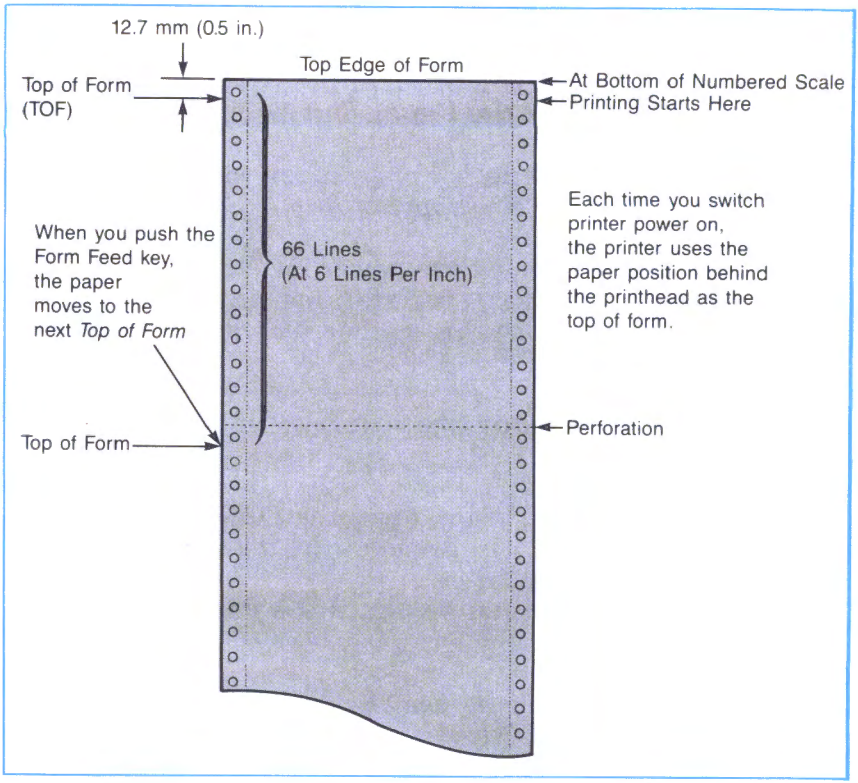
Whenever you switch power on, the printer sets the top of form. Adjust the paper *before* you set the printer power switch to on.

Each time your press the **Form Feed** key, the paper moves to the same place on the *next* page.

Operator Note!

When you place the top **edge** of the form at the bottom of the **numbered scale**, printing starts 12.7 mm (0.5 in.) from the top **edge** of the form.

Use the drawing on the **next page** to help you understand how to set the **top of form**.



Operator Note!

The length of the form and the page length set in the printer are the same in this example. For additional information see **"Section 4. Printer Control Codes and Escape Sequences."**

After the Printer is Out of Paper

You can also set the **top of form** the **first** time you press the **Online** key, *after* the **Paper Out** light comes on.

Note: *Press the* **Online** *key once,* **after** *you adjust the top edge of your new supply of forms.*

Use this method (leaving the power on) to save any previously-set items like special formatting, tabs, and downloaded fonts. Use this method *only* after the **Paper Out** light comes on.

To make the **Paper Out** light come on, if the light is *not* already on:

1. If the **Ready** light is on, press the **Online** key.
2. Tear off the supply of forms at the tear-line *before* the paper enters the printer.
3. Press the **Form Feed** key until the **Paper Out** light comes on.

If you have any problems, see "Problem Determination Procedures" on page 5-1.

Cleaning Your Printer

CAUTION

Before you clean the printer:

1. Switch the printer power off
2. Unplug the power cord at both ends.

Cleaning the Inside of the Printer: Remove your ribbon cartridge before any vacuuming to prevent the ribbon going into the vacuum. Every three months: use a soft brush and a vacuum to remove dust, ribbon lint, and pieces of paper. Vacuum any dust directly *below* the **forms thickness lever**. You may move the print head to the right, to clean below the **forms thickness lever**.

CAUTION

The print head stays hot after continuous use. Allow the print head to cool before you touch the print head.

Cover Cleaning: Clean the printer outer cover with a *damp* cloth and mild soap. Do not use any spray-type or chemical cleaners anywhere on your printer. Do not put any liquids or spray near the air vents. For stubborn ink stains on the cover, use a commercially available mechanic's hand cleaner. For best results, let cleaner set 1 – 2 hours before removing.

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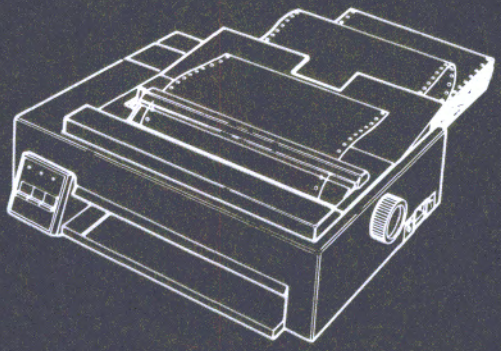
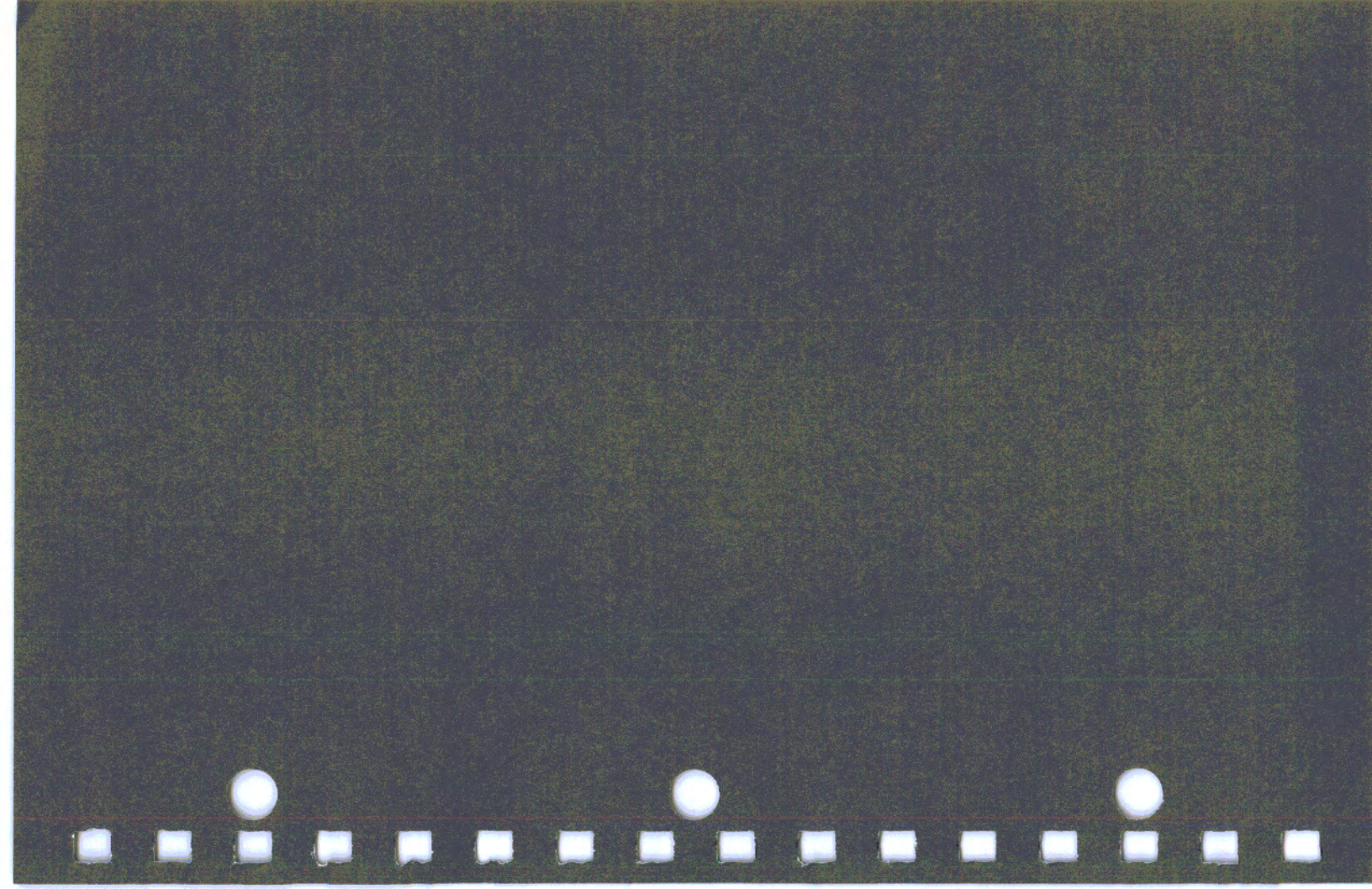
Section 4. Printer Control Codes and Escape Sequences





4

Section 4. Printer Control Codes and Escape Sequences

Printer Control Codes and Escape Sequences . . . 4-3
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Character Set 2 Chart (ASCII values in decimal) 4-38
All Characters Chart (ASCII values in decimal) . 4-40

Notes:

Printer Control Codes and Escape Sequences

Printer control codes and escape sequences are special characters that your computer sends to the printer to control its operation.

All examples in this guide use American National Standard Code for Information Interchange (ASCII) decimal values in parentheses.

Descriptions

The following list describes each control code and escape sequence.
Some knowledge of BASIC (or, knowing how to put printer control codes in your program) is necessary to use the codes properly. An example of each code in BASIC follows each description.

Operator Note!

Please note the semicolon at the end of the LPRINT statement. The semicolon (;) prevents the carriage return (CR) and line feed (LF) at the end of the statement.

Control Codes

Code	Description
BEL	**Beeper** Sounds the printer beeper once, for about 1 second. The beeper switch (switch 1) setting does not affect the BEL control code. `LPRINT CHR$(7);`
BS	**Backspace** Moves the print head one character width to the left. The character spacing you select determines the exact movement of the print head. If the current print position is at one, the printer ignores **BS** (the same as a **NUL** control code). Use this control code to create overstrike characters. `LPRINT CHR$(8);`
CAN	**Cancel Data** Clears all data stored in the last print buffer, but does not change the current print position. `LPRINT CHR$(24);`

Code	Description
CR	**Carriage Return** Causes the data that follows a **CR** to print at the left side. No line feed occurs unless: • The automatic line feed switch (switch 3) is on, or • Your computer sends an **ESC 5** to the printer. `LPRINT CHR$(13);` *Note: IBM Personal Computer* `BASIC` *(and many other programs) automatically send line feed (LF) with carriage return (CR). If you do not want LF sent after CR, use ASCII decimal value 141 in place of ASCII decimal value 13. Your printer must be in Character Set 1.*
DC1	**Select Printer** Sets the printer to accept data from your computer. `LPRINT CHR$(17);`

Code	Description
DC2	**10 Characters per Inch Print** Cancels condensed mode and 12 characters per inch (CPI) and sets the printer to 10 characters per inch (CPI). This control code does not cancel double-wide print. `LPRINT CHR$(18);`
DC3	**Deselect Printer** The printer ignores this control code. `LPRINT CHR$(19);`
DC4	**Cancel Double-Wide Printing by Line** Ends double wide printing by line started by **SO**. Returns the printer to the previous character spacing. `LPRINT CHR$(20);`
FF	**Form Feed** Advances the paper to the next **top of form** and does a carriage return (**CR**). `LPRINT CHR$(12);`
HT	**Horizontal Tab** Moves the print head to the next horizontal tab stop. If the next horizontal tab stop is beyond the right side, the printer ignores **HT**. Set tab stops with **ESC D**. The setting at power on is a tab stop every 8 positions, beginning at tab stop 9. `LPRINT CHR$(9);`

Code	Description
NUL	**Null** The printer ignores a **NUL** control code. `LPRINT CHR$(0);`

SI	**Condensed Printing**
	This control code causes the printer to begin condensed printing. Character spacing in condensed printing is 17.1 characters per inch. The **DC2** control code cancels this mode, and returns spacing to 10 characters per inch.
	
	`LPRINT CHR$(15);`
	
	or,
	
	`LPRINT CHR$(27);CHR$(15);`

SO	**Double-Wide Printing by Line**
	Causes the printer to start double-wide printing. Double-wide printing prints the characters twice as wide as the current character spacing. This results in half as many characters per inch. Each character takes up the space of two tab positions. A Carriage Return, Cancel, Line Feed, Form Feed, Vertical Tab, ESC W, or DC4 cancels the SO control code.
	
	`LPRINT CHR$(14);`
	
	or,
	
	`LPRINT CHR$(27);CHR$(14);`

Code	Description
SP	**Space** This control code causes the printer to move the current horizontal position one character space to the right. `LPRINT CHR$(32);`
VT	**Vertical Tab** This control code advances the paper to the next vertical tab stop position. If the automatic CR switch (switch 6) is on, the printer does an *automatic* carriage return. If the next vertical tab stop is greater than the form length (or form length minus skip perforation), the **VT** does a line feed (**LF**). If no vertical tab stops are set (or at power on reset), the **VT** does a **LF**. `LPRINT CHR$(11);`

Code	Description
ESC	**Command Prefix** Sets the printer to accept the next data sent as a printer command. `LPRINT CHR$(27);`

ESC A	**Store Text Line Spacing**
	Format: ESC A;n;
	ESC A stores a line spacing value of n x 0.3528 mm (n/72 in.). ESC 2 (start text line spacing) must be sent to start the text line spacing. The text line spacing is the amount the form moves for line feeds.
	
	For example, to store a line spacing value of 8.47 mm (24/72 in.), the code is ESC A 24. Any line feeds (LF) sent before ESC 2 space at the previously set line spacing amount. The LFs following the ESC 2 use the new line spacing amount of 8.47 mm (24/72 in.). Use any amount between 1/72 and 85/72. If n = 0, the previous ESC A setting remains, if present. If not, 6 lines per inch spacing is used.
	
	`LPRINT CHR$(27);CHR$(65);CHR$(n);`
	
	or,
	
	`LPRINT CHR$(27);"A";CHR$(n);`

Code	Description

ESC B	**Set Vertical Tabs**
	Format: ESC B;n_1;n_2;...n_{64};0;
	Sets the vertical tab stop positions in lines. At power on, the printer has no vertical tab stops set. n_1 through n_{64} represent tab stop positions by line number. The line at the top of the form is line 1. This escape sequence cancels all previous tab settings. The printer uses tab stop positions in ascending order. The printer recognizes up to 64 positions.
	
	Once vertical tab stops are set, they remain in effect until you specify new tab stops. If no vertical tab stops are set, the Vertical Tab (**VT**) control code does the same as a line feed (**LF**) control code. **ESC R** or **ESC B 0** cancels all vertical tab stops.
	
	`LPRINT CHR$(27);CHR$(66);CHR$(n1);`
	`CHR$(n2);...CHR$(n64);CHR$(0);`
	
	or,
	
	`LPRINT CHR$(27);"B";CHR$(n1);`
	`CHR$(n2);...CHR$(n64);CHR$(0);`

Code	Description

ESC C	**Set Form Length in Lines** "Form Length Control Codes."'
	Format: ESC C;n;
	Sets the form length in lines. You must follow **ESC C** with **n**, which specifies the desired length of the form in lines. The maximum form length for this printer is 255 lines. This sequence also sets the current position of the paper as the **top of form**. ESC C overrides the setting of the form length switch (switch 4).
	
	`LPRINT CHR$(27);CHR$(67);CHR$(n);`
	
	or,
	
	`LPRINT CHR$(27);"C";CHR$(n);`
	
	Notes:
	
	1. *Automatic perforation skip (***ESC N***) is reset. Refer to* **ESC C 0** *for setting the form length in inches.*
	
	2. *The printer converts the number of lines (***n***) to inches, using the current line spacing. The printer saves the form length in inches and does not change the form length when you change line spacing.*

Code	Description

ESC C 0	**Set Form Length in Inches**
	Format: ESC C;0;n;
	Sets the form length in inches. This sequence overides the setting of the form length switch (switch 4).
	This sequence also sets the current position of the paper as the **top of form**.
	
	`LPRINT CHR$(27);CHR$(67);CHR$(0);`
	`CHR$(n);`
	
	or,
	
	`LPRINT CHR$(27);"C";CHR$(0);`
	`CHR$(n);`
	
	*Note: Automatic perforation skip (**ESC N**) is reset. If n = 0, the printer ignores this sequence.*

ESC D	**Set Horizontal Tabs**
	Format: ESC D;n_1;n_2;...n_{28};0;
	Sets the horizontal tab stop positions represented by n_1 through n_{28}. The power on setting is a tab stop every eight positions, beginning at column 9. The printer recognizes up to 28 horizontal tab stops. The tabs must be in ascending order and followed by 0. Tab stops can be set starting with 1. **ESC D 0** cancels all previous tab settings. **ESC R** sets all horizontal tabs to power on values.
	
	`LPRINT CHR$(27);CHR$(68);CHR$(`n_1`);`
	`CHR$(`n_2`);...CHR$(`n_{28}`);CHR$(0);`
	
	or,
	
	`LPRINT CHR$(27);"D";CHR$(`n_1`);`
	`CHR$(`n_2`);...CHR$(`n_{28}`);CHR$(0);`

Code	Description

ESC E	**Emphasized Printing**
	Changes the printer to emphasized printing. Characters are struck twice with the smallest possible horizontal space between strikes. During this mode, the printer runs at half speed.
	
	`LPRINT CHR$(27);CHR$(69);`
	
	or,
	
	`LPRINT CHR$(27);"E";`

ESC F	**Cancel Emphasized Printing**
	Ends emphasized printing started by **ESC E**.
	
	`LPRINT CHR$(27);CHR$(70);`
	
	or,
	
	`LPRINT CHR$(27);"F";`

ESC G	**Double Strike (NLQ) Printing**
	This sequence sets double strike mode. Characters print in near-letter quality (NLQ) mode.
	
	`LPRINT CHR$(27);CHR$(71);`
	
	or,
	
	`LPRINT CHR$(27);"G";`

ESC H	**Cancel Double Strike (NLQ) Printing**
	This sequence ends double strike printing started by **ESC G**.
	
	`LPRINT CHR$(27);CHR$(72);`
	
	or,
	
	`LPRINT CHR$(27);"H";`

Code	Description

ESC I	**Select Print Mode**
	Format ESC I;n;
	This sequence selects the printing quality.
	
	• When n = 0, you have normal quality (standard font).
	• When n = 2, you have near-letter quality (NLQ) (standard font).
	• When n = 4, you have normal quality (download font).
	• When n = 6, you have NLQ (download font).
	
	Each printing quality selection produces a different spacing of the dots that make up a character. Use **ESC =** to load a download font, before you select the print quality (with either **ESC I;(4);** or **ESC I;(6);**).
	
	`LPRINT CHR$(27);CHR$(73);CHR$(n);`
	
	or,
	
	`LPRINT CHR$(27);"I";CHR$(n);`

Code	Description

ESC J	**Variable Line Space**
	Format: ESC J;n;
	This sequence advances the paper n x 0.12 mm (n/216 in.). The value of n must be between 1 and 255. Use a line spacing of 24/216 inch for bit-image graphics, using eight bits.
	
	An automatic **CR** occurs when the automatic CR switch (switch 6) is on.
	
	For **n**, use exact multiples of 3 to move exactly n/216 inch.
	
	ESC J is reset after the line space takes place. The printer does not store the value of n.
	
	`LPRINT CHR$(27);CHR$(74);CHR$(n);`
	
	or,
	
	`LPRINT CHR$(27);"J";CHR$(n);`
	
	*Note: The printer ignores automatic perforation skip (**ESC N**) for this escape sequence.*

Spacing	n/216
8 LPI	27/216
6 LPI	36/216
8-dot	24/216
7-dot	21/216

Figure 4-1. Escape J Line Spacing Values

Code	Description
ESC K	**480 Bit-Image Graphics** Format: ESC K;n_1;n_2;v_1;v_2; ... v_{480} This sequence specifies bit-image data at the normal print speed and spacing. Spacing is 60 dots per inch horizontally and 72 dots per inch vertically. The printer can print 480 dot columns on an 8-inch line, at 508 mm (20 in.) per second. Each vertical column can have eight rows of dots. n_1 and n_2 are binary numbers that specify the number of bit-image data bytes to transfer. All bit-image graphics print from left to right. The total number of bit-image data bytes is equal to n_1 + (n_2 x 256) and cannot exceed 480 (the total number of dot positions in an 8-inch line). For example, to print 480 dot columns, $n_1 = 224$ and $n_2 = 1$. The printer discards any data bytes over the amount of 480. Bit-image graphics print using eight of the nine print head wires (the bottom wire is not used). v_1 through v_{480} are bit-image data bytes. ***Continued on next page.***

Code	Description
ESC K	Each byte represents a set of eight dots in a vertical line. The horizontal placing of the eight dots is determined by the position of the bit-image data byte within the v_1 through v_{480} series. v_1 prints at the starting position followed in order from left to right by v_2 through v_{480}. Each bit of a bit-image data byte represents a vertical dot location. The dot location is at the horizontal position represented by that bit-image data byte. The lowest value, or least significant bit (bit 0), represents the bottom dot position. The highest value, or most significant bit (bit 7), represents the top dot position.
ESC K	In the following list, the column of (●) represents dot positions within a vertical line. The **bit number** column shows the corresponding bit number within a bit-image data byte. (The bit numbering is 7 through 0, from left to right.) **Dot Position** **Bit Number (binary value)** Top ● --- 7 (128) ● --- 6 (64) ● --- 5 (32) ● --- 4 (16) ● --- 3 (8) ● --- 2 (4) ● --- 1 (2) ● --- 0 (1) Bottom ***Continued on next page.***

Code	Description

ESC K	For example: If v_1 is binary 10000000 (decimal 128), only the top dot prints; if v_1 is binary 00000001 (decimal 01), only the bottom dot prints; and if v_1 is binary 11111111 (decimal 255), all eight dots print.
	
	`LPRINT CHR$(27);CHR$(75);CHR$(n1); CHR$(n2);CHR$(v1);CHR$(v2); ... CHR$(v480);`
	
	or,
	
	`LPRINT CHR$(27);"K";CHR$(n1); CHR$(n2);CHR$(v1);CHR$(v2); ... CHR$(v480);`

ESC L	**960 Bit-Image Graphics (half speed)**
	Format:
	ESC L;n_1;n_2;v_1;v_2; ... v_{960}
	For improved print quality (and to print adjoining dots), ESC L prints at half the speed of 480 bit-image graphics (ESC K). The printer can print 960 dot columns on an 8-inch line, at 254 mm (10 in.) per second. n_1, n_2, v_1, and v_2 through v_{960} represent the same values as in 480 bit-image graphics (ESC K). The total number of bit-image data bytes is equal to $n_1 + (n_2 \times 256)$ and cannot exceed 960 (the total number of dot positions in an 8-inch line). For example, to print 960 dot columns, $n_1 = 192$ and $n_2 = 3$. Refer to the description of ESC K for the meaning of the values. The printer discards any data bytes over the amount of 960.
	
	`LPRINT CHR$(27);CHR$(76);CHR$(n1); CHR$(n2);CHR$(v1);CHR$(v2); ... CHR$(v960);`
	
	or,
	
	`LPRINT CHR$(27);"L";CHR$(n1); CHR$(n2);CHR$(v1);CHR$(v2); ... CHR$(v960);`

Code	Description

ESC N	**Set Automatic Perforation Skip**
	Format: ESC N;n;
	This sequence specifies the number of lines the printer skips at the end of each page. This causes the printer to skip over the perforation between pages of continuous forms. The value of n must be between 1 and 255. **ESC N** is reset when you change the form length by **ESC C** (set form length in lines) or by **ESC C 0** (set form length in inches).
	
	`LPRINT CHR$(27);CHR$(78);CHR$(n);`
	
	or,
	
	`LPRINT CHR$(27);"N";CHR$(n);`
	
	*Note: The printer converts the number of lines (**n**) to inches, using the current line spacing. The printer saves the form length in inches and does not change the form length when you change line spacing.*

ESC O	**Cancel Automatic Perforation Skip**
	This sequence cancels the automatic perforation skip sequence.
	
	`LPRINT CHR$(27);CHR$(79);`
	
	or,
	
	`LPRINT CHR$(27);"O";`

Code	Description

ESC Q 3	**Deselect IBM Proprinter**
	Format: ESC Q;3;
	This sequence is intended for diagnostic purposes only. This sequence tells the printer to not accept data from the computer. The computer must reset the printer or select the printer, using **DC1** (Select Printer) to accept data.
	
	`LPRINT CHR$(27);CHR$(81);CHR$(3);`
	
	or,
	
	`LPRINT CHR$(27);"Q";CHR$(3);`

ESC R	**Set All Tabs to Power On Settings**
	This sequence sets horizontal tabs at every eight positions starting at column 9 and clears all vertical tabs.
	
	`LPRINT CHR$(27);CHR$(82);`
	
	or,
	
	`LPRINT CHR$(27);"R";`

Code	Description

ESC S	**Subscript or Superscript Printing**
	Format: ESC S;n;
	ESC S 1 changes the printer to subscript printing. ESC S 0 changes the printer to superscript printing.
	
	ESC T cancels **ESC S.**
	
	`LPRINT CHR$(27);CHR$(83);CHR$(n);`
	
	or,
	
	`LPRINT CHR$(27);"S";CHR$(n);`

ESC T	**Cancel Subscript or Superscript**
	This sequence ends subscript or superscript printing started by **ESC S.**
	
	`LPRINT CHR$(27);CHR$(84);`
	
	or,
	
	`LPRINT CHR$(27);"T";`
	
	Note: If the printer receives an **ESC T** *when the printer is not printing in subscript or superscript, the printer ignores this escape sequence.*

Code	Description

ESC U	**Print in One Direction**
	Format: ESC U;n;
	When n = 1, this code sets the printer to print from left to right only. ESC U 0 returns the printer to normal two direction printing. One direction printing, while slower, ensures a more accurate printing start position for better print quality.
	
	`LPRINT CHR$(27);CHR$(85);CHR$(n);`
	
	or,
	
	`LPRINT CHR$(27);"U";CHR$(n);`

ESC W	**Continuous Double Wide Printing**
	Format: ESC W;n;
	ESC W 1 changes the printer to double wide printing. ESC W 0 ends the double wide printing started by ESC W 1. ESC W resets double wide printing mode previously set by **SO**
	
	`LPRINT CHR$(27);CHR$(87);CHR$(n);`
	
	or,
	
	`LPRINT CHR$(27);"W";CHR$(n);`

Code	Description

ESC Y	**960 Bit-Image Graphics**
	Format: ESC Y;n_1;n_2;v_1;v_2; ... v_{960}
	Prints at normal printing speed. The printer can print 960 dot columns on an 8-inch line, at 508 mm (20 in.) per second. ESC Y graphics cannot print dots in adjoining horizontal dot positions. If you specify adjoining dot positions, the second dot does not print. You can mix bit-image data with text data on the same line. n_1, n_2, v_1, and v_2, through v_{960} represent the same values as in 480 Bit-Image Graphics (**ESC K**). The total number of bit-image data bytes is equal to n_1 + (n_2 x 256) and cannot exceed 960 (the total number of dot positions in an 8-inch line). For example, to print 960 dot columns, $n_1 = 192$ and $n_2 = 3$. Refer to the description of **ESC K** for a complete description of the values.
	
	`LPRINT CHR$(27);CHR$(89);`
	`CHR$(n1);CHR$(n2);`
	`CHR$(v1);CHR$(v2); ...CHR$(v960);`
	
	or,
	
	`LPRINT CHR$(27);"Y";CHR$(n1);`
	`CHR$(n2); CHR$(v1);`
	`CHR$(v2); ...CHR$(v960);`

Code	Description

ESC Z	**1920 Bit-Image Graphics**
	Format: ESC Z;n_1;n_2;v_1;v_2; ... v_{1920}
	For improved print quality, 1920 bit-image graphics prints at half the speed of 480 bit-image graphics (**ESC K**). The printer can print 1920 dot columns on an 8-inch line, at 254 mm (10 in.) per second. If you specify adjoining dot positions, the second dot does not print. You can mix bit image data with text data on the same line. n_2, v_1, v_2, and v_{1920} represent the same values as in 480 bit-image graphics (ESC K). The total number of bit-image data bytes is equal to n_1 + (n_2 x 256) and cannot exceed 1920 (the total number of dot positions in an 8-inch line). For example, to print 1920 dot columns, n_1 = 128 and n_2 = 7. Refer to the description of **ESC K** for a complete description of the values.
	
	`LPRINT`
	`CHR$(27);CHR$(90);CHR$(n1);CHR$(n2);`
	`CHR$(v1);CHR$(v2);...CHR$(v1920);`
	
	or,
	
	`LPRINT`
	`CHR$(27);"Z";CHR$(n1);CHR$(n2);`
	`CHR$(v1);CHR$(v2);...CHR$(v1920);`

ESC 0	**1/8 Inch Line Spacing**
	This sequence sets the line spacing to 8 lines per inch.
	
	`LPRINT CHR$(27);CHR$(48);`
	
	or,
	
	`LPRINT CHR$(27);"0";`

Code	Description

ESC 1	**7/72 Inch Line Spacing**
	This sequence sets the line spacing to 7/72 inch.
	
	`LPRINT CHR$(27);CHR$(49);`
	
	or,
	
	`LPRINT CHR$(27);"1";`

ESC 2	**Start Text Line Spacing**
	ESC 2 is a sequence that starts an **ESC A** (Set Text Line Spacing). If no **ESC A** sequence has been entered, line spacing is 6 lines per inch. Line feeds move forms the amount ESC A specifies.
	
	`LPRINT CHR$(27);CHR$(50);`
	
	or,
	
	`LPRINT CHR$(27);"2";`

Code	Description

ESC 3	**Graphics Line Spacing**
	Format: ESC 3;n;
	Sets line spacing to n/216 inch. Use a line spacing of 24/216 inch for bit-image graphics using eight bits. The value of n must be between 1 and 255.
	
	For n, use exact multiples of 3 to move exactly n/216 inch.
	
	`LPRINT CHR$(27);CHR$(51);CHR$(n);`
	
	or,
	
	`LPRINT CHR$(27);"3";CHR$(n);`

ESC 4	**Set Top of Form**
	This sequence sets the current paper position as the top of form.
	
	`LPRINT CHR$(27);CHR$(52);`
	
	or,
	
	`LPRINT CHR$(27);"4";`

Code	Description

ESC 5	**Automatic Line Feed**
	Format: ESC 5;n;
	When n = 1, automatic line feeding starts. The printer does a line feed each time the printer receives a carriage return (**CR**). ESC 5 overrides the automatic line feed switch (switch 3). When n = 0, automatic line feeding stops.
	
	`LPRINT CHR$(27);CHR$(53);CHR$(n);`
	
	or,
	
	`LPRINT CHR$(27);"5";CHR$(n);`

ESC 6	**Select Character Set 2**
	This sequence selects Character Set 2. Character Set 2 contains characters and symbols used in non-English languages. ESC 6 overrides the character set switch (switch 5). See "Character Set 2 Chart" at the end of this section.
	
	`LPRINT CHR$(27);CHR$(54);`
	
	or,
	
	`LPRINT CHR$(27);"6";`
	
	Note: If your program uses control codes with values above 128, use character set 1. If your program does not use control codes with values above 128, you can use character set 2.

Code	Description

ESC 7	**Select Character Set 1**
	This sequence selects Character Set 1. Character Set 1 contains characters and symbols commonly used in the English language. Character Set 1 also contains some common non-English, characters and symbols. ESC 7 overrides the character set switch (switch 5). See "Character Set 1 Chart" at the end of this section.
	
	`LPRINT CHR$(27);CHR$(55);`
	
	or,
	
	`LPRINT CHR$(27);"7";`
	
	Note: If your program uses control codes with values above 128, use character set 1. If your program does not use control codes with values above 128, you can use character set 2.

ESC _	**Continuous Overscore**
	Format: ESC _;n;
	When n = 1, the printer overscores all data and spaces that follow. ESC _0 cancels overscoring.
	
	`LPRINT CHR$(27);CHR$(95);CHR$(n);`
	
	or,
	
	`LPRINT CHR$(27);"_";CHR$(n);`
	
	Note: The printer does not overscore spaces caused by a HT.

Code	Description

ESC -	**Continuous Underscore**
	Format: ESC -;n;
	When n = 1, the printer underlines all data and spaces that follow. ESC -0 cancels underscoring.
	
	`LPRINT CHR$(27);CHR$(45);CHR$(n);`
	
	or,
	
	`LPRINT CHR$(27);"-";CHR$(n);`
	
	Note: The printer does not underscore spaces caused by a HT.

ESC :	**12 Characters per Inch Printing**
	This sequence sets character spacing to 12 characters per inch. DC2 resets to 10 characters per inch (CPI).
	
	`LPRINT CHR$(27);CHR$(58);`
	
	or,
	
	`LPRINT CHR$(27);":";`

Code	Description
ESC =	**Character Font Image Download** This sequence starts a character font image download. Use a maximum of 94 characters. If you load less than 94, all character codes must be continuous from the first character code. You can select the downloaded font with ESC I CHR$(4) or ESC I CHR$(6).

The two parts of the ESC = control code are:

1. ***Part one*** includes ***count 1, count 2,*** and ***code.*** Use this part once for each ESC = command.

2. ***Part two*** includes the ***attribute*** and ***col.1*** through ***col.11.*** Repeat this part for each character you download.

Part One	`CHR$(27);"=";CHR$(count1);` `CHR$(count2);CHR$(20);CHR$(code);`
Part Two	`CHR$(attribute);CHR$(0);` `CHR$(col.1);...CHR$(col.11);`

- ***Count 1*** and ***count 2*** show how many characters to download. The next section describes how to calculate the values of ***count1*** and ***count2.***

- ***Code*** is the ASCII decimal value for the first downloaded character. The download characters replace normal characters starting at that code point. For example, to download a character set that replaces characters beginning with the uppercase letter "A", code = 65 (ASCII "A" = decimal 65). You can download to any point from decimal 33 through decimal 126. All character codes are consecutive from the starting code point.

- ***Attribute*** implies whether the character is ascending or descending. If ***attribute*** = 0, the character prints with the top eight print wires of the print head (ascending character). If ***attribute*** = 1, the character prints with the bottom eight wires of the print head (descending character).

- ***Col.1*** through ***col.11*** are the values of the vertical columns of dots in each character.

Calculating Count 1, Count 2 Values for ESC =: To calculate the values for ***count 1*** and ***count2***:

1. Calculate the ***total count*** with this formula:

   total count = (number of characters x 13) + 2

2. If the total count is less than 256, then ***count 1 = total count*** and ***count 2 = 0***. For example, for 2 characters:

   total count = (2 x 13) + 2 = 28.

   count 1 = 28

   count 2 = 0

3. If the total count is greater than or equal to 256, then divide the number of bytes by 256. ***Count 1*** = the remainder and ***count 2*** = the integer part of the result. For example, for 94 characters:

   total count = (94 x 13) + 2 = 1224

   1224/256 = 4 200/256

   count 1 = 200

   count 2 = 4

Example – Downloading the © Symbol: This example replaces the "@" character (decimal 64) with the copyright symbol (©). The example uses the *top* eight wires (attribute = 0). ***Count 1*** and ***count 2*** for the example are :

total count = (1 x 13) + 2 = 15.
count 1 = 15
count 2 = 0
code = `CHR$(64)`
attribute = `CHR$(0)`

```
20 LPRINT CHR$(27);"=";CHR$(15);
   CHR$(0);CHR$(20);CHR$(64);
   CHR$(0);CHR$(0);CHR$(60);CHR$(66);
   CHR$(0);CHR$(153);CHR$(165);
   CHR$(165);CHR$(165);CHR$(129);
   CHR$(0);CHR$(66);CHR$(60);
```

This example loads data for the copyright symbol into the printer. The data remains in the download font part of storage until you:

- Set the printer power switch to off, or,
- Overlay the data with other character data, or,
- Send the following to the printer to clear the download font buffer:
  `LPRINT CHR$(27);"=";CHR$(0);CHR$(0);`

Downloading data to one code position does not affect any other code positions that *already* have data from a previous ESC =.

Notes:

1. *The initialize signal does not clear the download font buffer or the download font select.*

2. *See "Examples" in the IBM Proprinter Technical Reference for further information.*

Code	Description

ESC \	**Print Continuously From All Characters Chart**
	Format: ESC \ ;n_1;n_2;
	This sequence allows the printing of all characters, including characters with an ASCII value below decimal 32. The printer normally recognizes the ASCII values less than decimal value 32 as control codes. ESC \ allows the printer to print the special symbols assigned to the ASCII control codes. You can also use this sequence to print characters between 128-159 (for Character Set 1). If the printer receives a code value for an unassigned character, a space character prints. No control code functions operate when this sequence is in effect. Refer to the "All Characters Chart" in this section.
	
	The total number of characters is equal to n_1 + (n_2 x 256).
	
	`LPRINT CHR$(27);CHR$(92);`
	`CHR$(n1);CHR$(n2);`
	
	or,
	
	`LPRINT CHR$(27);"\";`
	`CHR$(n1);CHR$(n2);`

Code	Description

ESC ^	**Print Single Character From All Characters Chart.**
	This sequence prints one character from the All Characters Chart (at the end of this section). You can use this sequence to print codes the printer normally recognizes as control codes.
	
	See ESC \ for further information. Refer to the "All Characters Chart" in this section.
	
	`LPRINT CHR$(27);CHR$(94);`
	
	or,
	
	`LPRINT CHR$(27);"^";`

Mixing Print Modes

Certain combinations of print modes give you the following results:

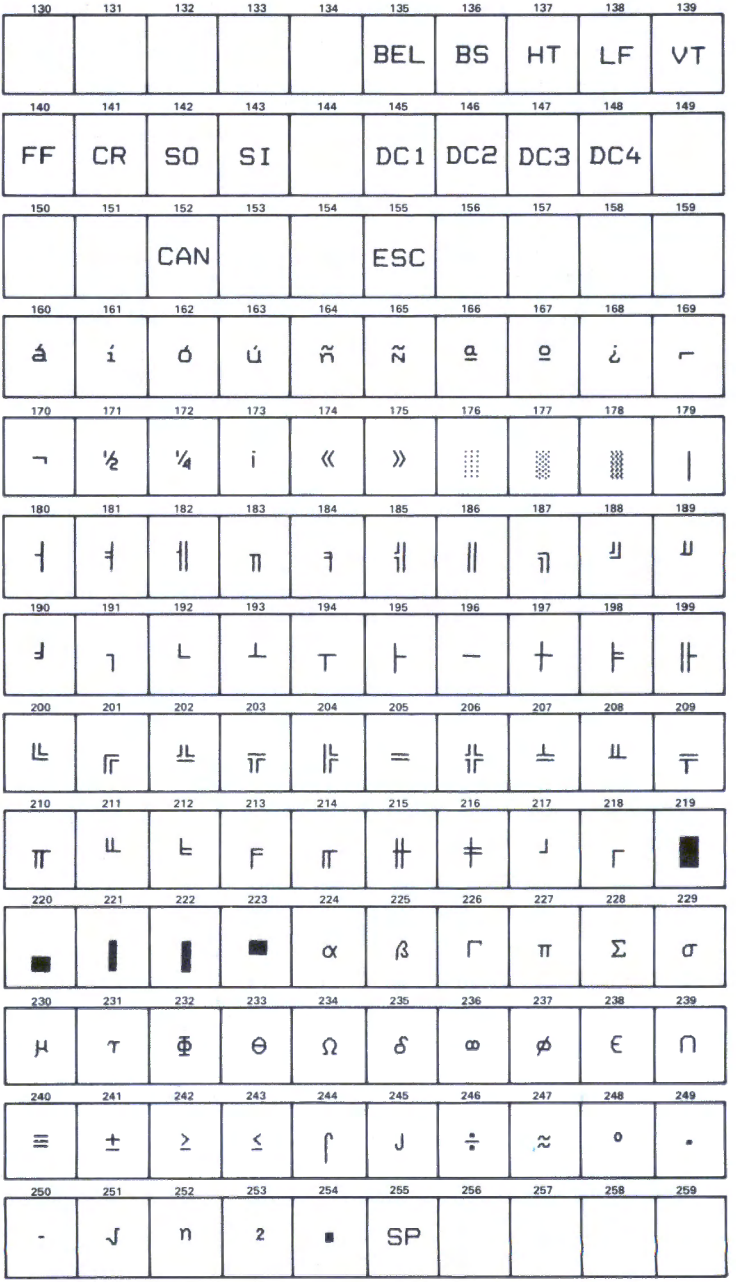
Print Mode Combinations	Resulting Mode
Condensed, Emphasized	Emphasized
Condensed, 12 CPI	12 CPI
Condensed, NLQ	Condensed
Condensed, NLQ, Emphasized	NLQ, emphasized
10 CPI, 12 CPI	Last mode selected
Superscript, Subscript	Last mode selected

All other combinations are valid.

Note: Block character graphics (codes 176-223, 244) cannot have overscores or underscores.

Character Set 1 Chart (ASCII values in decimal)

0	1	2	3	4	5	6	7	8	9
NUL							BEL	BS	HT
10	11	12	13	14	15	16	17	18	19
LF	VT	FF	CR	SO	SI		DC1	DC2	DC3
20	21	22	23	24	25	26	27	28	29
DC4				CAN			ESC		
30	31	32	33	34	35	36	37	38	39
		SP	!	"	#	$	%	&	'
40	41	42	43	44	45	46	47	48	49
(	)	*	+	,	-	.	/	0	1
50	51	52	53	54	55	56	57	58	59
2	3	4	5	6	7	8	9	:	;
60	61	62	63	64	65	66	67	68	69
<	=	>	?	@	A	B	C	D	E
70	71	72	73	74	75	76	77	78	79
F	G	H	I	J	K	L	M	N	O
80	81	82	83	84	85	86	87	88	89
P	Q	R	S	T	U	V	W	X	Y
90	91	92	93	94	95	96	97	98	99
Z	[	\	]	^	_	`	a	b	c
100	101	102	103	104	105	106	107	108	109
d	e	f	g	h	i	j	k	l	m
110	111	112	113	114	115	116	117	118	119
n	o	p	q	r	s	t	u	v	w
120	121	122	123	124	125	126	127	128	129
x	y	z	{	¦	}	~		NUL	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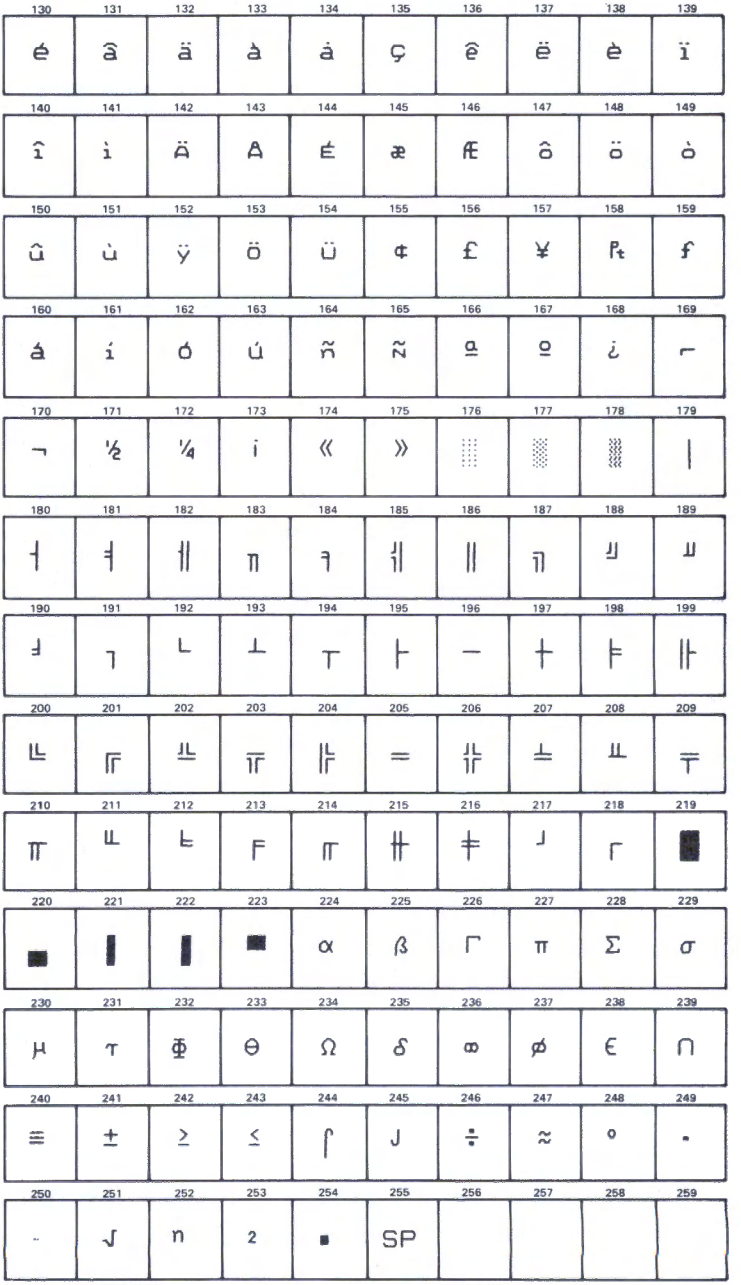
BEL BS HT LF VT
140 141 142 143 144 145 146 147 148 149
FF CR SO SI DC1 DC2 DC3 DC4
150 151 152 153 154 155 156 157 158 159
CAN ESC
160 161 162 163 164 165 166 167 168 169
170 171 172 173 174 175 176 177 178 179
180 181 182 183 184 185 186 187 188 189
190 191 192 193 194 195 196 197 198 199
200 201 202 203 204 205 206 207 208 209
210 211 212 213 214 215 216 217 218 219
220 221 222 223 224 225 226 227 228 229
230 231 232 233 234 235 236 237 238 239
240 241 242 243 244 245 246 247 248 249
250 251 252 253 254 255 256 257 258 259
SP

Character Set 2 Chart (ASCII values in decimal)

0	1	2	3	4	5	6	7	8	9
NUL			♥	♦	♣	♠	BEL	BS	HT
10	11	12	13	14	15	16	17	18	19
LF	VT	FF	CR	SO	SI		DC1	DC2	DC3
20	21	22	23	24	25	26	27	28	29
DC4	§			CAN			ESC		
30	31	32	33	34	35	36	37	38	39
		SP	!	"	#	$	%	&	'
40	41	42	43	44	45	46	47	48	49
(	)	*	+	,	-	.	/	0	1
50	51	52	53	54	55	56	57	58	59
2	3	4	5	6	7	8	9	:	;
60	61	62	63	64	65	66	67	68	69
<	=	>	?	@	A	B	C	D	E
70	71	72	73	74	75	76	77	78	79
F	G	H	I	J	K	L	M	N	O
80	81	82	83	84	85	86	87	88	89
P	Q	R	S	T	U	V	W	X	Y
90	91	92	93	94	95	96	97	98	99
Z	[	\	]	^	_	`	a	b	c
100	101	102	103	104	105	106	107	108	109
d	e	f	g	h	i	j	k	l	m
110	111	112	113	114	115	116	117	118	119
n	o	p	q	r	s	t	u	v	w
120	121	122	123	124	125	126	127	128	129
x	y	z	{	¦	}	~		Ç	ü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é â ä à ȧ Ç ê ë è ï
140 141 142 143 144 145 146 147 148 149
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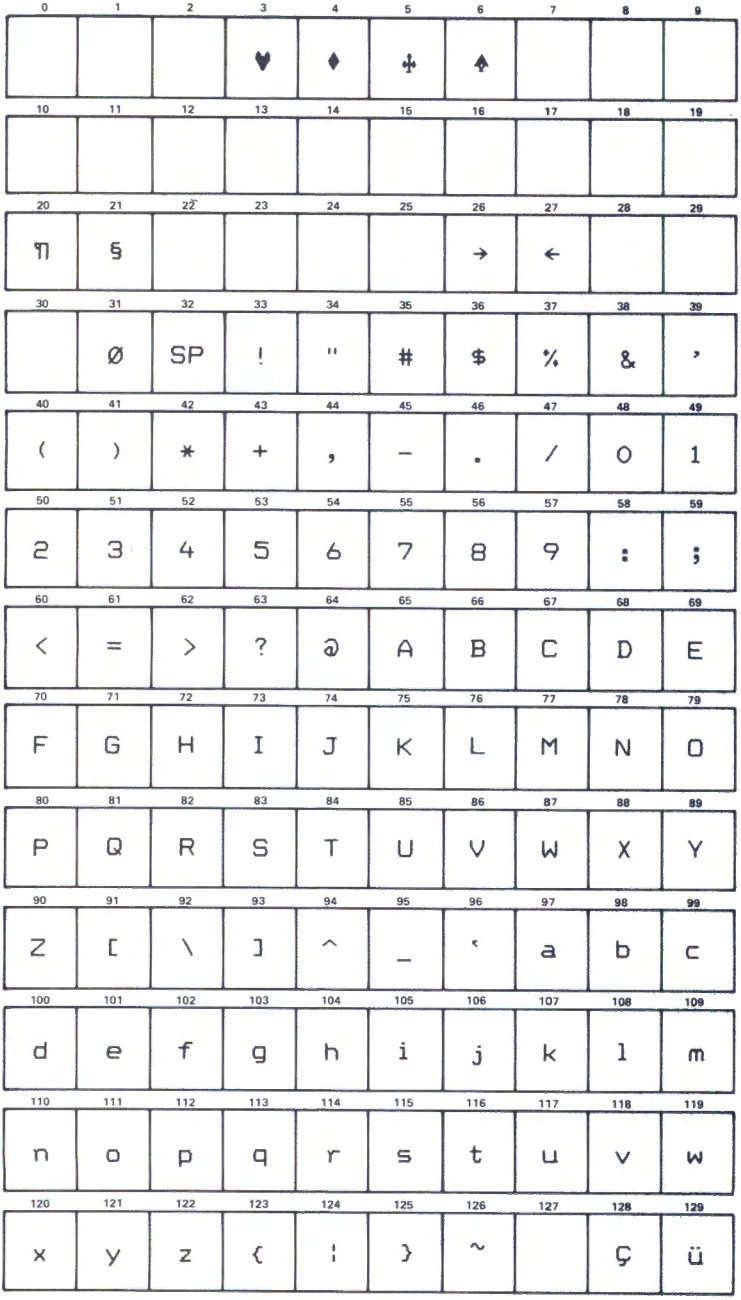
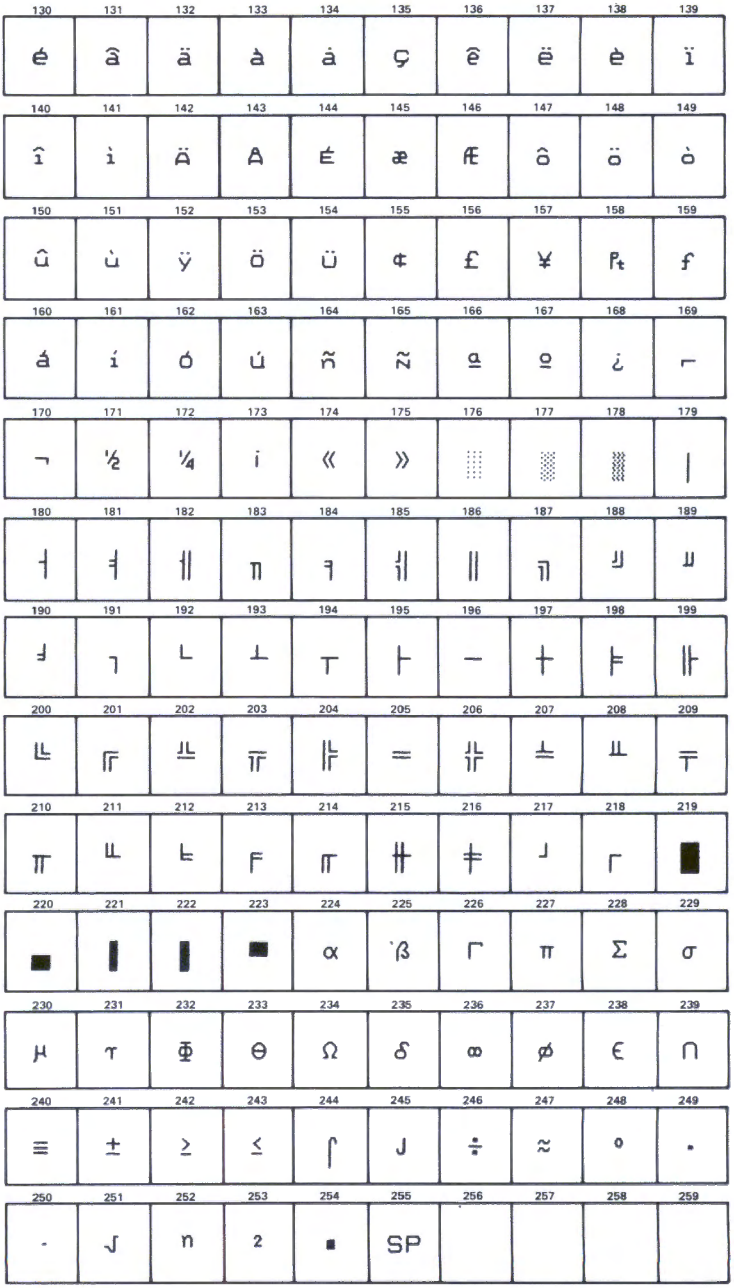
180 181 182 183 184 185 186 187 188 189
┤ ╡ ╢ ╖ ╕ ╣ ║ ╗ ╝ ╜
190 191 192 193 194 195 196 197 198 199
╛ ┐ └ ┴ ┬ ├ ─ ┼ ╞ ╟
200 201 202 203 204 205 206 207 208 209
╚ ╔ ╩ ╦ ╠ ═ ╬ ╧ ╨ ╤
210 211 212 213 214 215 216 217 218 219
╥ ╙ ╘ ╒ ╓ ╫ ╪ ┘ ┌ ■
220 221 222 223 224 225 226 227 228 229
▄ ▌ ▐ ▀ α ß Γ π Σ σ
230 231 232 233 234 235 236 237 238 239
µ τ Φ Θ Ω δ ∞ ø ∈ ∩
240 241 242 243 244 245 246 247 248 249
≡ ± ≥ ≤ ⌠ ⌡ ÷ ≈ ° ∙
250 251 252 253 254 255 256 257 258 259
· √ n 2 ■ SP

All Characters Chart (ASCII values in decimal)

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190 191 192 193 194 195 196 197 198 199
200 201 202 203 204 205 206 207 208 209
210 211 212 213 214 215 216 217 218 219
220 221 222 223 224 225 226 227 228 229
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240 241 242 243 244 245 246 247 248 249
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SP

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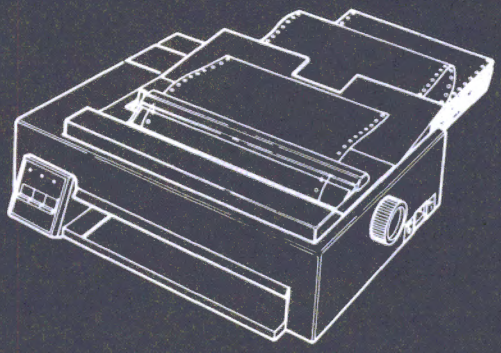
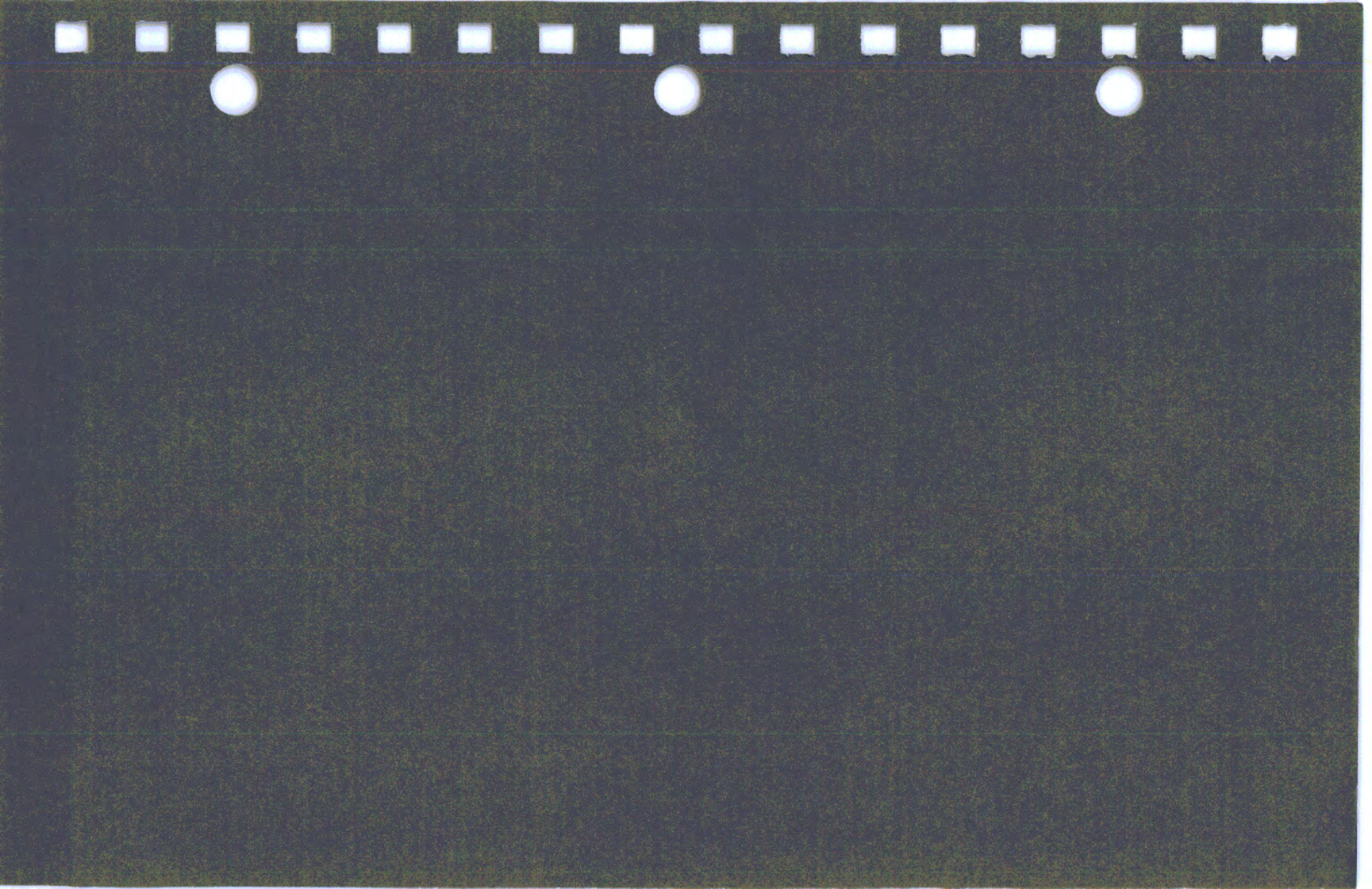
Section 5. Problem Determination Procedures





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Section 5. Problem Determination Procedures

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Notes:

Problem Determination Procedures

Start Here!

This section helps you solve printer problems.

Determine if the problem is in the printer the software (program) or the options. If a program does not run correctly on the printer, see if a different program runs correctly.

What to look for:

- Did you plug the printer power cord in?
- Is something stuck in the printer?
- Is the supply of forms catching on the forms carton?
- Is a part physically damaged?
- Are switches set correctly? See "How to Change a Switch Setting" on page 6-4.
- Have you run the self-test recently?
- If the self-test fails with any options installed, replace the failing option.
- If the self-test fails with no options installed, have the printer serviced.

If you are still having printer problems, go to the next page. This section helps you solve many problems without requiring printer repair.

If you change anything on the printer, try the self-test again. If you still have the same symptom and have checked everything, your printer requires service.

Contact (or ship your printer to) an IBM Authorized Dealer or an IBM Service/Exchange Center. See "What to Do When the Printer Needs Repair" on page A-1.

Operator Note!

Before you ship the printer to an IBM Service/Exchange Center, remove and keep:

Ribbon cartridge
Power cord
Printer cable

If You Are Still Having Printer Problems

CAUTION
The print head stays hot after continuous use. Allow the print head to cool before you touch the print head.

Do each step in order. Try to run the self-test after each step. See "How to Test the Printer (Self Test)" on page 2-18.

1. Run the test procedures for your computer.
2. Make sure your printer power cord is correctly connected at both ends.
   a. Ensure the printer power cord is completely plugged into a wall outlet.
   b. Ensure the printer power cord is plugged into the printer.
   c. Ensure any other items plugged into the same wall outlet are operating.
   d. Make sure the wall outlet does not turn off with the wall switch.
   e. Plug the printer into a different wall outlet.
3. Set the power switch to Off (**O**).
4. Disconnect the printer cable (from your computer or terminal) at the ***printer*** end.
5. Run the self-test. See "How to Test the Printer (Self Test)" on page 2-18. If the self-test fails, **go to the next step.**

6. Look at the operator panel lights and check for your symptom in the following charts:

Power On	Paper Out	Ready	Meaning
ON	OFF	ON	Normal operating condition
ON	OFF	OFF	Normal offline condition. If the printer does not line feed or form feed have the printer serviced.
ON	ON	OFF	Put paper in the printer.
ON	Flashing alternately	Flashing alternately	Check for a paper or ribbon jam. Set the printer power switch to off. Remove the ribbon. See "How To Install the Ribbon Cartridge" on page 2-7. Check for paper dust or bits of paper in the area directly below the forms thickness lever. See "Cleaning Your Printer" on page 3-31. Run the self-test. See "How to Test the Printer (Self Test)" on page 2-18. If the self-test fails, have the printer serviced.

Power On	Paper Out	Ready	Meaning
ON	ON	ON	Set the printer power switch to off, wait several seconds, then set the printer power switch to on. Try this procedure three times. If *all three* lights remain on, have the printer serviced.
OFF	OFF	OFF	Check the power cord and wall outlet. If all three lights remain off, have the printer serviced.

If you still have a problem, use the following **Symptom Charts**.

Symptom Charts

Use the following charts to determine if your printer needs service. If the **"Then Do This"** does not correct your problem, the printer needs service.

1. Find your **Symptom** in the LEFT column.
2. Read the **Probable Cause** in the MIDDLE column.
3. Read the **Then Do This** in the RIGHT column.

Symptom	Probable Cause	Then Do This
Printer does not feed paper.	Paper jam.	Remove ***all*** forms and pieces of paper. See "How To Clear a Paper Jam" on page 5-17. Look for the pinfeed hole strips that can tear from continuous forms. Before you install new forms, fan the forms to loosen the sheets.
	Forms thickness lever set incorrectly.	Check the setting of the forms thickness lever. See "Forms Thickness Lever" on page 3-11.

Symptom	Probable Cause	Then Do This
Printer sounds like the printer is printing but does not print or prints too light.	Jammed ribbon. Ribbon twisted or is not between the print head and the ribbon guide.	Ensure the ribbon cartridge is correctly installed. Ensure the ribbon is between the guide on the print head and the end of the print head. Replace the ribbon. See "How To Install the Ribbon Cartridge" on page 2-7.
	Forms thickness lever set incorrectly.	Check the setting of the forms thickness lever. See "Forms Thickness Lever" on page 3-11.

Symptom	Probable Cause	Then Do This
Forms smudged or printing is too dark.	Forms thickness lever set incorrectly.	Move the forms thickness lever toward the front of the printer. See "Forms Thickness Lever" on page 3-11.
	Ribbon twisted or is not between the print head and the ribbon guide. Ribbon guide missing (on print head).	Install the ribbon correctly. See "How To Install the Ribbon Cartridge" on page 2-7. Printer needs repair.

Symptom	Probable Cause	Then Do This
Printing is too light.	Forms thickness lever adjusted incorrectly.	Move the forms thickness lever toward the rear of the printer. See "Forms Thickness Lever" on page 3-11.
	Ribbon is worn.	Replace the ribbon. See "How To Install the Ribbon Cartridge" on page 2-7. Ensure the ribbon is between the guide on the print head and the end of the print head.
Printing is too light.	If the printer has not been in use for some time, the exposed ribbon can cause slightly lighter printing.	Normal use keeps the ribbon moving.

Symptom	Probable Cause	Then Do This
Printing beyond the side edge of the forms.	Paper adjusted incorrectly.	Adjust both pinfeed wheels. See "How to Set the Margin on Continuous Forms" on page 3-24. Adjust the paper. See "How to Set the Margin on Cut Forms" on page 3-18.
	Programming problem	Check the program.
Missing dots.	Forms thickness lever adjusted incorrectly.	Move the forms thickness lever toward the rear of the printer. See "Forms Thickness Lever" on page 3-11.
	Print head is not working.	The printer needs repair.

Symptom	Probable Cause	Then Do This
Printer power switch is on, but Power On light is off.	No power to printer.	Ensure the power switch is on (|). Ensure the power cord is properly connected at both ends. Verify the outlet works. See "How to Test the Printer (Self Test)" on page 2-18.
Self-test works but the printer does not print when attached to the computer.	Printer cable problem.	Ensure the printer cable is properly connected at both ends.
	Program problem.	Check your computer program.
Incorrect number of lines on a page	Paper adjusted incorrectly.	Set the top of form. See "How to Set the Top of Form" on page 3-28.
	Programming problem	Check the program.
	Form length switch set incorrectly	See "How to Change a Switch Setting" on page 6-4.

Symptom	Probable Cause	Then Do This
Wrong or missing characters, formatting control codes do not work	Character Set switch set wrong	See "How to Change a Switch Setting" on page 6-4.
	Programming problem.	See Section 4 for control codes and escape codes.
Lines spaced incorrectly or undesired double spacing or over printing.	Automatic LF switch set wrong	See "How to Change a Switch Setting" on page 6-4.
	Programming problem.	See Section 4 for control codes and escape codes.
	Paper advance knob was manually turned while the Ready light is on (not a recommended operation).	See "How to Set the Top of Form" on page 3-28. See "How to Test the Printer (Self Test)" on page 2-18.

Symptom	Probable Cause	Then Do This
Line length wrong, graphics do not print, lines not starting at left margin.	Automatic CR switch set wrong	See "How to Change a Switch Setting" on page 6-4.
	Programming problem.	See Section 4 for control codes and escape codes.
Left margin moves to the right during printing.	The print head is not moving correctly.	Check the ribbon and paper. See "How To Install the Ribbon Cartridge" on page 2-8. See "How To Put Forms in Your Printer" on page 3-13.
	Programming problem	See Section 4 for control codes and escape codes.
Noisy	Vibration	Move any objects touching the printer. Check the table or desk the printer sets on.

Symptom	Probable Cause	Then Do This
Feels hot.	Blocked vents	Clear anything that blocks the air vents.
Smells, smokes.	Circuit failure	Disconnect the printer power cord at the wall outlet. The printer needs service.
Erratic printing, prints wrong characters, left margin changes or stops printing.	Static or nearby interference from electrical devices.	Avoid any high static discharge near the printer. Move any devices with electric motors away from the printer. See "How To Put Forms in Your Printer" on page 3-13.

How to Tell When the Printer Has an Error

The printer detects and shows two types of of errors.

Musical Tone-Type Beep (Paper Out)

The **Paper Out** light stays on, telling you the printer is out of paper. See "How to Put Forms in Your Printer" on page 3-13.

The **Paper Out** light comes on continuously when the printer has about 12.7 mm (0.5 in.) of paper left in the printer. The **Paper Out** light stays on while the printer is out of paper. After you put paper in the printer, the **Online** key turns off the **Paper Out** light.

Same, Quick Beep for Three Seconds (Printer Error)

The **Paper Out** and **Ready** lights blink alternately. The printer has detected an internal error. If you have any problems, see "Problem Determination Procedures" on page 5-1.

Single Beep

The printer is responding to a **BEL** control code (`CHR$(7)`).

How to Clear a Paper Jam

Cut Forms Jams

1. Move the paper release lever toward the front of the printer.
2. Remove the sheet.
3. Move the paper release lever toward the rear of the printer.

If you are using page formatting, you need to correctly set the top of the form. See "How to Set the Top of Form" on page 3-28.

Continuous Forms Jams

1. Tear the forms off (at the perforated line) before the forms enter the printer. Remove any forms already printed.
2. Carefully turn the paper advance knob to remove the forms.
3. Use the following procedure to remove ***all paper*** from the pinfeed wheels.

Paper Jam Removal

Your printer has simple, easy-to-remove **pinfeed wheel guides** so you can remove jammed paper from your printer.

Use the following procedure to remove and replace the **pinfeed wheel guides**.

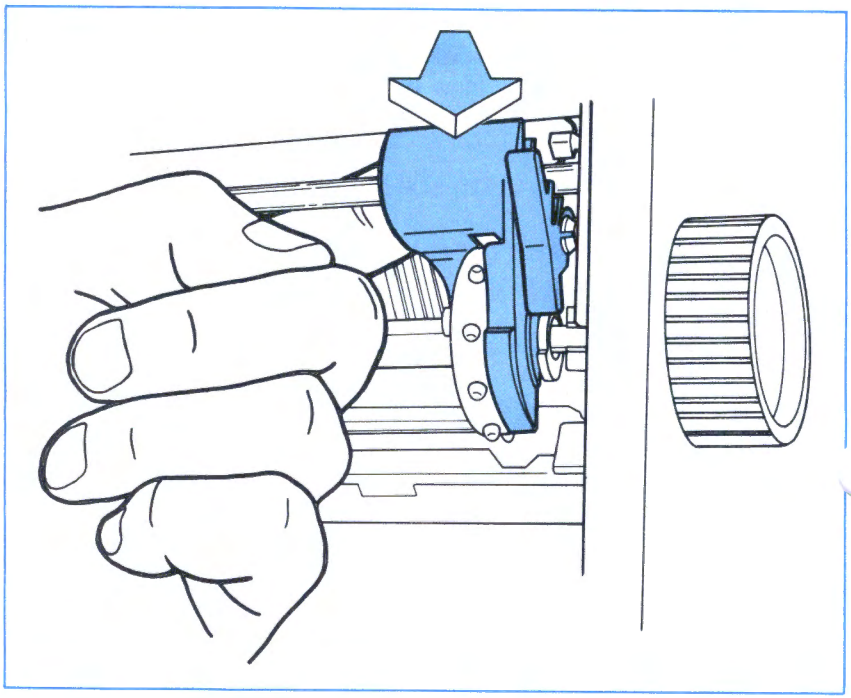
How to Remove a Pinfeed Wheel Guide

1. Unlock the pinfeed wheel locking lever on the **pinfeed wheel guide** you are removing.

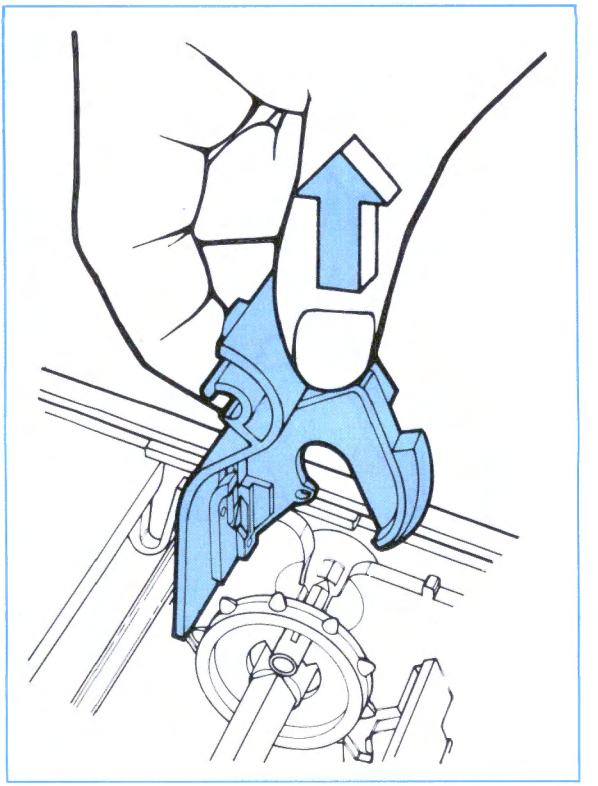
2. If you are removing the left **pinfeed wheel guide**, move the *left* pinfeed wheel all the way to the left side.

3. If you are removing the right **pinfeed wheel guide**, move the *right* pinfeed wheel all the way to the right side.

4. *Ensure you do not push up on the round metal rod in this step.* Place your finger under the plastic tab for the guide you are removing. Push upward on the tab to loosen the guide.



5. With slight force, pull straight up on the **pinfeed wheel guide**, and remove from printer.



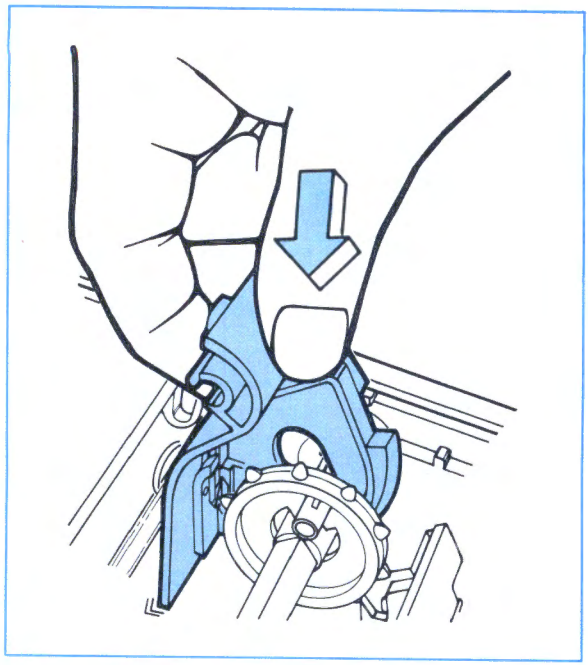
6. Remove any jammed pieces of paper.

How to Replace a Pinfeed Wheel Guide

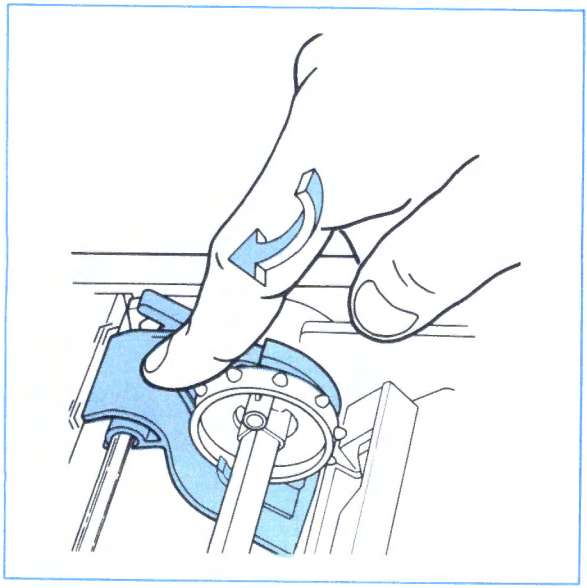
1. Ensure the pinfeed wheel is about 25.4 mm (1.0 in) from the side of the printer.

2. Place the **pinfeed wheel guide** against the pinfeed wheel.

3. Push (down) against the top of the **pinfeed wheel guide**. Ensure the **pinfeed wheel guide** fastens to the pinfeed wheel.



4. Push the top of the **pinfeed wheel guide** toward the rear of the printer. Ensure the **pinfeed wheel guide** fastens to the round metal rod.



If you are using page formatting, you need to correctly set the top of form. See "How to Set the Top of Form" on page 3-28.

Programming Problems

Program commands from your computer control the printer. If your printer problem only occurs during a particular program, look at the program. Look for control codes or escape sequences that might cause the problem. Check the switch settings. See "How to Change a Switch Setting" on page 6-4.

Additional Information

Read the *Proprinter Technical Reference* for additional information about control codes, escape codes, and programming examples.

If you need additional help with setup or operation, contact an IBM Authorized Dealer, an IBM Product Center, or the IBM Branch Office serving your locality.

Service

Contact (or ship your printer to) an IBM Authorized Dealer or an IBM Service/Exchange Center. See "What To Do When the Printer Needs Repair" on page A-1. Do not try to repair the printer yourself.

Operator Note!

Before you ship the printer to an IBM Service/Exchange Center, remove and keep:

Ribbon cartridge
Power cord
Printer cable

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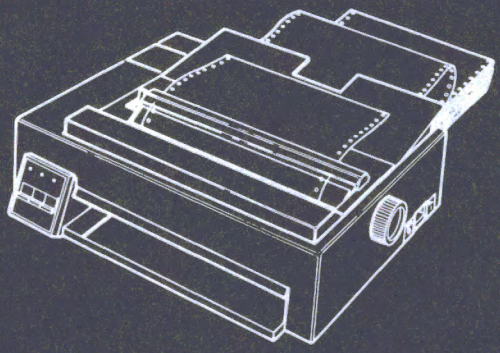
Section 6. How to Change the Switch Settings



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Section 6. How to Change the Switch Settings

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What the Switches Do 6-3
How to Change a Switch Setting 6-4

Notes:

How to Change the Switch Settings

This section tells you how to change the printer switches to meet your particular needs.

> **Warning:** *Always* set the printer Power switch to (**O**) before changing a switch.

What the Switches Do

Your printer has six switches that let you change six different functions.

The switches determine how the printer operates when you set the power switch On. You can change some of the ways the printer operates, after you switch the power On, by using escape codes. When you switch the printer power Off, the printer cancels any functions set by programming, earlier.

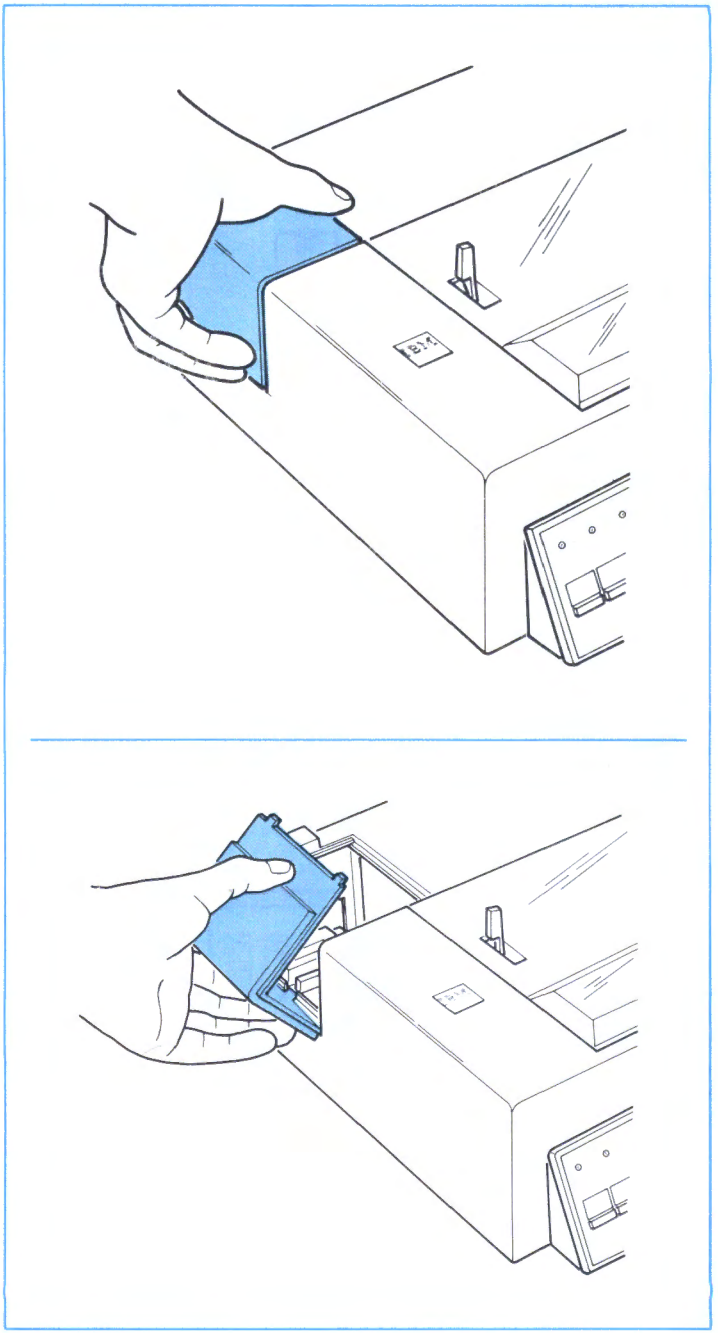
Switch Number	Meaning	ON	OFF	Factory Setting
1	Beeper	No beep when the **Paper Out** light is on	Beeps when the **Paper Out** light is on	OFF

Switch Number	Meaning	ON	OFF	Factory Setting
2	Slashed Zeros	Slashed zeros	Normal zeros	OFF
3	Automatic Line Feed	Automatic LF after CR	No LF after CR. ESC 5 overrides.	OFF
4	Form Length	12-inch	11-inch ESC C overrides.	OFF
5	Character Set	Set 2	Set 1 ESC 6 or ESC 7 overrides.	OFF
6	Automatic CR	Causes automatic CR on LF, VT, and ESC J.	Prevents automatic CR on LF, VT, and ESC J.	OFF
7	Reserved			OFF

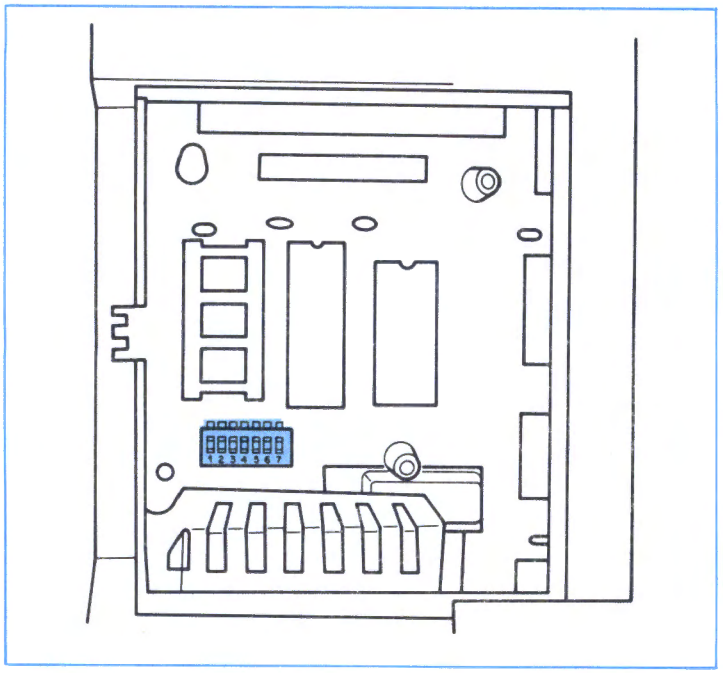
How to Change a Switch Setting

1. If you have any continuous forms in the printer, remove the forms.
2. Set the power switch to Off (**O**).
3. Disconnect the printer power cord from the wall outlet.

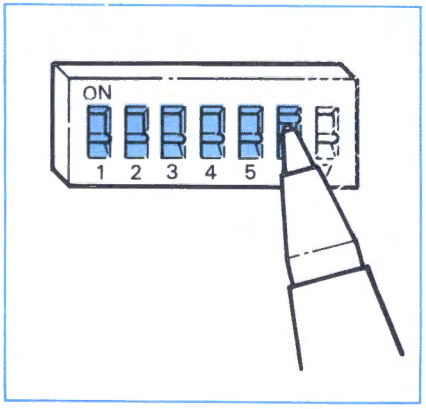
4. Grip the access cover as shown, and press with your thumb (as shown) to remove the cover.



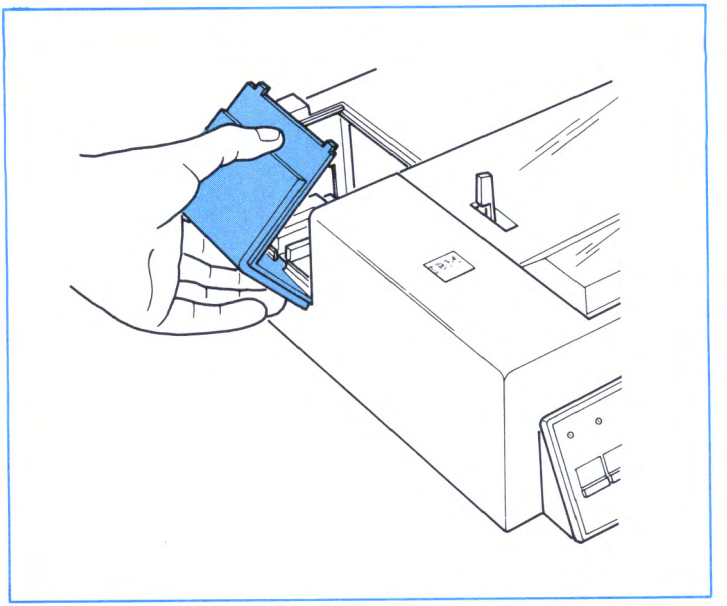
5. Look for the switches on the printer circuit board.



6. Change the proper switch (1-6) setting for the operation you want to change.



7. Replace the access cover as shown.



8. Connect the printer power cord to the wall outlet.

The printer functions that you change occur when you set the power switch to On (|).

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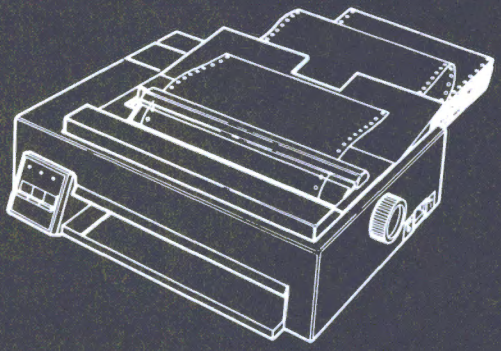
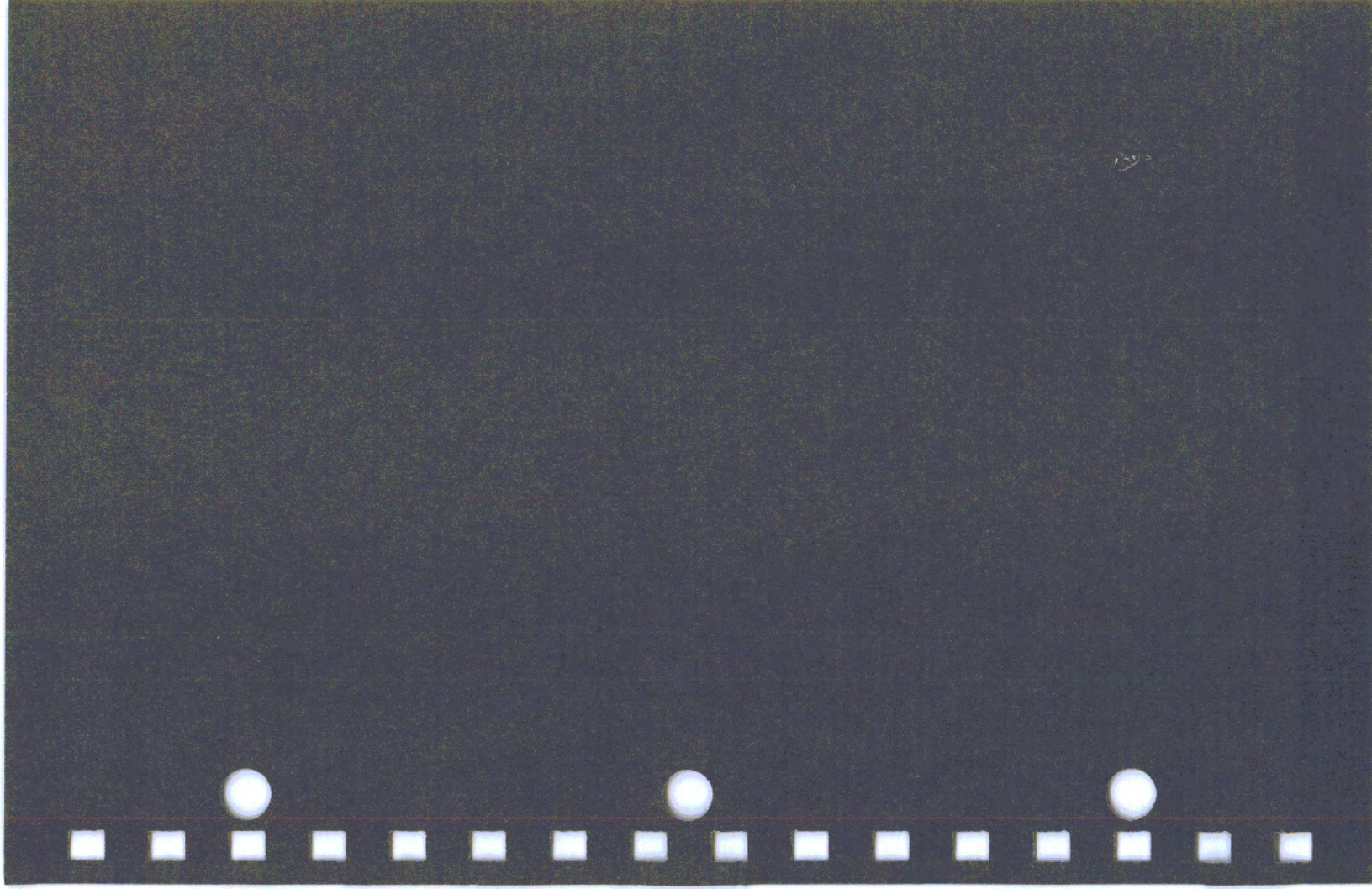
Section 7. How to Move Your Printer





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Section 7. How to Move Your Printer

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Moving a Short Distance 7-3
Moving a Long Distance 7-3
How to Set Up at New Location 7-3

Notes:

How to Move Your Printer

This section tells you how to pack up your printer for moving. If your printer requires service, you must ensure the printer does not receive any damage during shipping. If you do not carry the printer into a service location, you must pack the printer for shipping.

Remove (and keep) the ribbon, printer cable and any options before you ship the printer to IBM.

Contact your IBM Authorized Dealer, an IBM Product Center, or the IBM Branch Office serving your locality for any questions about the printer cable.

Moving a Short Distance

If you are moving the printer a short distance (to another room, for example), remove both the printer cable and the power cord before you move the printer.

Moving a Long Distance

If you need to pack your printer for shipping, do so carefully. The best method is to use the original shipping carton with the original packing material.

If you use other than the original carton, pad the printer and tape the covers to avoid damage.

How to Set Up at New Location

See Section 2 of this guide.

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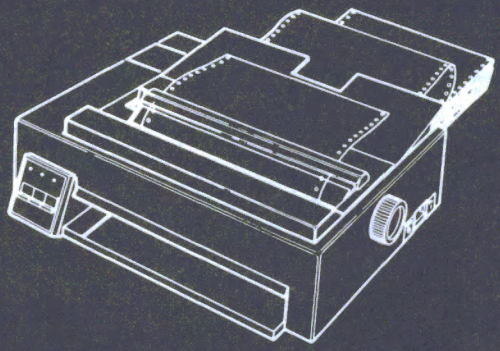
Appendices and Glossary



Appendix A. What to Do When the Printer Needs Repair

What to Remove from the Printer

You must take certain precautions before you ship your printer for service. Do the following if your printer is in warranty or you have an IBM Maintenance Agreement. Before you ship the printer to an IBM Service/Exchange Center, remove and keep:

Ribbon cartridge
Power cord
Printer cable

Printer Cable

Contact your IBM Authorized Dealer, an IBM Product Center, or the IBM Branch Office serving your locality for any questions about the printer cable.

Who To Contact

For printer service, contact (or ship your printer to) an IBM Authorized Dealer or an IBM Service Exchange Center.

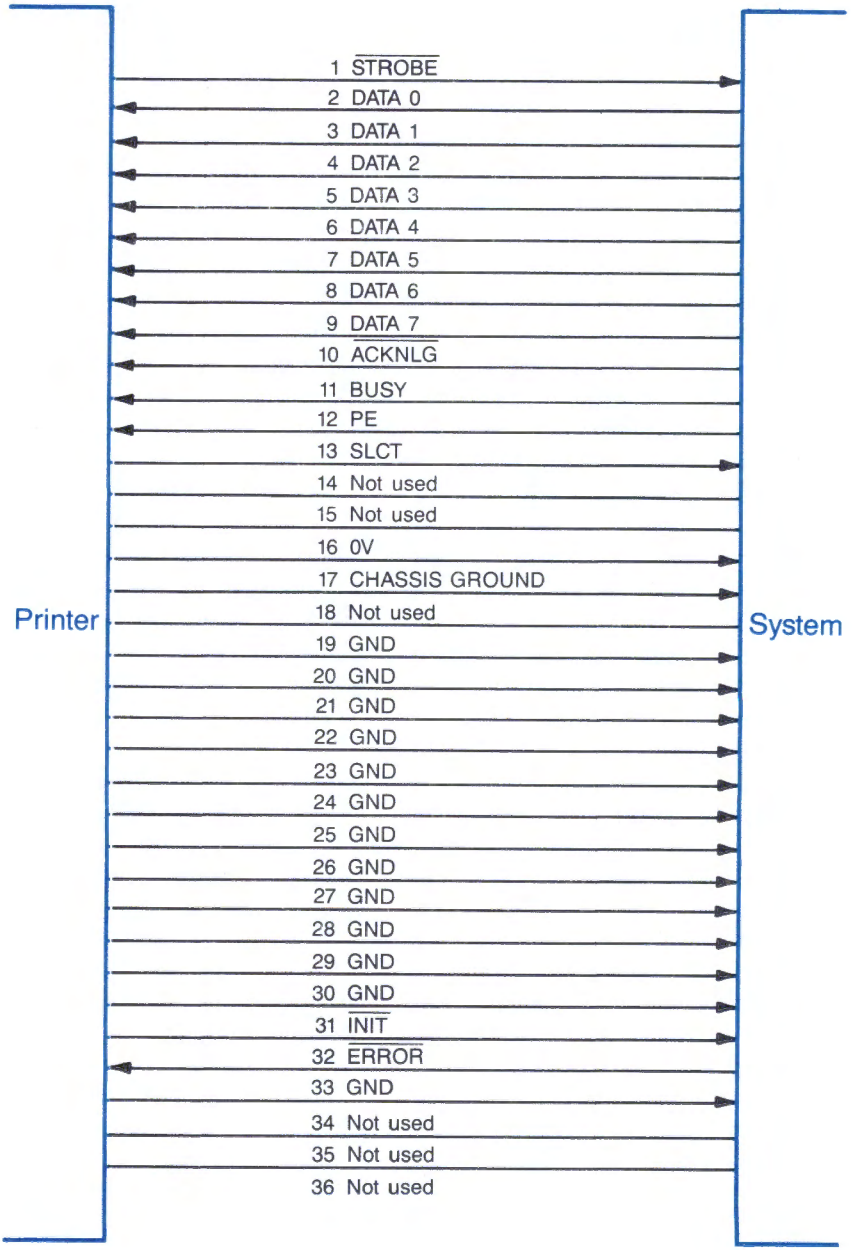
IBM Authorized Dealer

If an IBM Authorized Dealer repairs the printer, contact the dealer for specific instructions.

Notes:

Appendix B. Parallel Interface

Use the following chart to determine the connections your printer uses.

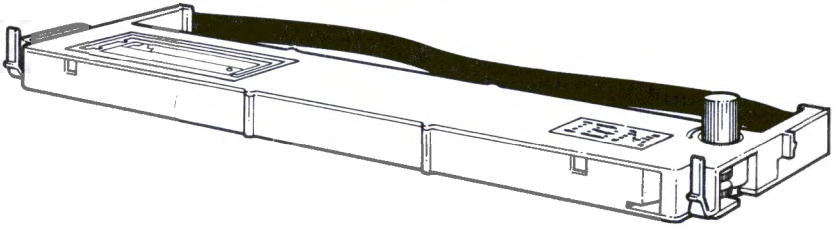


Notes:

Appendix C. Replacement Ribbons

Proprinter Ribbon

Reorder Number: Order IBM part number : 6328829 (black only).



Where to order

Marketing Representative _____
(Phone Number)

IBM Authorized Dealer _____
(Phone Number)

IBM Product Center _____
(Phone Number)

IBM DIRECT _____
(Phone Number)

Notes:

Appendix D. Factory-Set Options

If printer switches 1-6 are set off before you set the printer power switch to On (|), your printer has the following characteristics:

- Character Set 1
- 6 lines per inch
- 80 characters per line
- 10 characters per inch
- No automatic line feed after a carriage return
  - Use ESC 5 to override.
- Zeros print without a slash
- 11-inch forms length
  - Use ESC C to change to 12 inches.
- Beeper active.

Notes:

Glossary

This glossary includes terms and definitions from the *IBM Vocabulary for Data Processing, Telecommunications, and Office Systems*, GC20-1699.

A

access cover. The removable cover on the top surface of the Proprinter. Remove this cover to change the printer switch settings.

B

BASIC. Beginner's All-purpose Symbolic Instruction Code. A programming language that uses common English words.

baud. A unit of signaling speed.

binary digit. In binary notation, either of the characters 0 or 1.

bit. Synonym for binary digit.

bps. Abbreviation for bits per second.

byte. The representation of a character.

C

condensed. Condensed print mode is also called compressed print mode.

control code. A control character used for print operations such as line spacing or carriage return.

continuous forms. A series of connected paper forms that feed continuously through a printing device. The connection between the forms is perforated to allow the user to tear them apart. Before printing, the forms are folded in a stacked arrangement, with the folds along the perforated lines. Continuous forms have sprocket holes punched in the left and right margins. Contrast with cut forms.

CPS. Characters per second. Used to measure the printing speed of a printer.

cut forms. A single form, not connected to other forms. The form can have more than one part. For example, the form can have an original and one or more copies. Contrast with continuous forms.

D

data. All information entered into or used by a computer.

double strike. Double strike print mode is also called near-letter quality mode.

double wide. Double wide print mode is also called double width.

download. Refers to the sending of character font data to your printer from the computer.

DP. Refers to data processing quality printing. Also called normal, draft, electronic data processing (EDP), and good quality.

DPI. Refers to dots per inch.

E

emphasized. Emphasized print mode is also called bold, memo, and text mode.

escape sequence. A code extension character used, in some cases, with one or more succeeding characters. Escape sequences show by some convention or agreement that the coded statements following the character or group of characters are to be interpreted according to a different code or according to a different character set.

F

font. A family or assortment of characters of a given size and style.

I

interface. A shared boundary. An interface is a hardware component to link two devices.

L

LPRINT. A BASIC statement that prints data on a printer. Use LPRINT for the examples in this guide.

N

Near-letter quality (NLQ). Near-letter quality mode is also called double strike, text quality (TQ), memo, correspondence, and letter quality (LQ).

O

online. Pertaining to the operation of a functional unit that is under continual control of a computer.

P

parallel interface. The most common interface in use for connecting printers to personal computers. The computer sends all 8 bits of a character at the same time.

parity. A binary digit appended to a group of binary digits to make the sum of all the digits either always odd (odd parity) or always even (even parity).

pinfeed. A device that guides and feeds paper with sprocket feed holes with pins that engage the holes.

print modes. Refers to the actual appearance of the printed matrix character. This printer uses condensed, double wide, normal, emphasized, and near-letter quality print modes.

S

serial interface. Contrast with parallel. The computer or terminal sends each of the 8 bits of a character one at a time.

T

top of form. The position of the paper (at the print head) when you set the printer power switch to on. Printing starts at this position.

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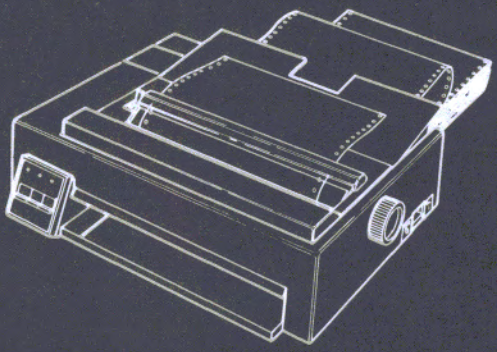

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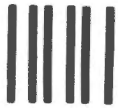

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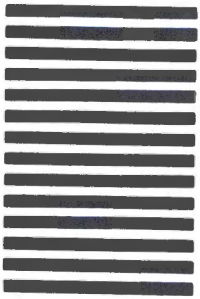

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