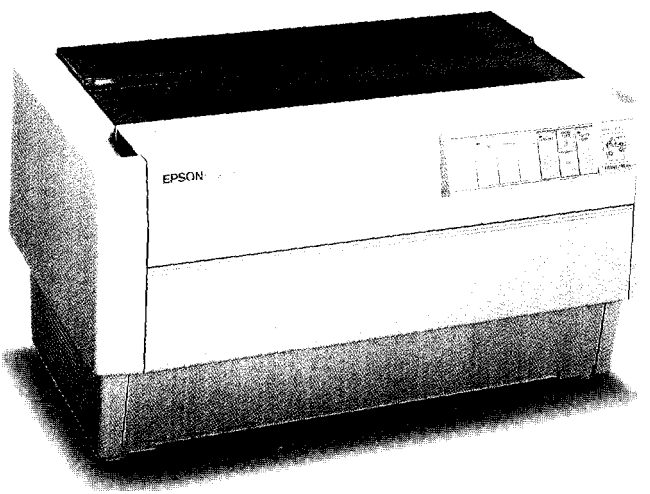
# User's Manual




**EPSON**

Y47599108002

# EPSON®

# D F X - 5 0 0 0

User's Manual

# FCC COMPLIANCE STATEMENT FOR AMERICAN USERS

This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference in a residential installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

-Reorient the receiving antenna
-Relocate the printer with respect to the receiver
-Plug the printer into a different outlet so that the printer and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful:

"Television Interference Handbook"

This booklet is available from the U.S. Government Printing Office, Washington, DC 20402. Stock No. 004-000-00450-7.

## WARNING

The connection of a non-shielded printer interface cable to this printer will invalidate the FCC Certification of this device and may cause interference levels which exceed the limits established by the FCC for this printer. If this printer has more that one interface connector, do not leave cables connected to unused interfaces.

# Table of Contents

# Introduction

The Epson® DFX-5000 printer is an advanced dot matrix printer designed for business applications. The printer combines high performance and reliability with a wide range of features including high-speed printing and automatic paper handling.

Here are some of the features that make the DFX-5000 unique:

- Extra-fast printing speeds of up to 533 characters per second in draft mode.
- Two built-in push tractors (front and rear) for convenient paper handling. This dual system lets you switch between types of continuous paper quickly and easily. The printer remembers separate top of form positions for each tractor.
- A front tractor that combines bottom feeding with easy front access.
- Automatic thickness adjustment for various paper types, including multi-part forms and labels.
- An improved control panel design that lets you select almost any feature with a single button.
- An automatic paper handling system that lets you control all operations from the control panel. For example, you can switch between paper loaded on the front and rear tractors with the push of a button. Another button feeds the paper forward so you can tear it off, and then reverses it to the top of the page so it is ready to print.
- Compatibility with the EPSON ESC/P commands used by Epson FX printers.

## Options

The following options are available for use with your DFX printer. For detailed information on the installation and use of these options, see Chapter 6.

### Pull tractor

This option improves the handling of heavy multi-part forms and labels. It also enhances printing alignment on preprinted forms.

### Optional interface boards

A number of optional interface boards can be used to supplement the DFX-5000's built-in parallel and serial interfaces. Guidelines for choosing the right interface and instructions for installing an interface board are given in Chapter 6.

### Coax and Twinax interface boards

Two other interface boards on the market (Coax and Twinax) let you use the DFX-5000 as a local printer for your IBM@ mainframe or minicomputer. These boards connect directly to the printer and allow it to function as a local IBM printer without the addition of any other circuitry or components.

### Printer stand

The DFX-5000's printer stand conveniently holds both front and rear paper supplies as well as stacks of printed output. The stand is on casters so you can move the printer easily.

## About This Manual

This user's manual provides step-by-step instructions for setting up and operating the DFX-5000 printer. It also includes information that you will need for your daily use of the printer.

Chapter 1 shows you how to unpack, set up, and connect the printer. Be sure to read and follow the instructions in this chapter first.

Chapters 2 and 3 give you important information on loading paper and using the printer. This information is necessary for the day-to-day operation of your printer.

Chapter 7 contains troubleshooting information, including a list of possible problems and recommended solutions.

Other chapters include information on enhancing your printing, maintaining the printer, using printer options, and a summary of software commands. The appendixes include reference tables and technical specifications.

At the back of the manual you'll find a glossary, an index, and a Quick Reference card listing software commands and DIP switch settings. Inside the back cover of this manual are illustrations of the printer with all of the major parts identified. You can unfold the cover and refer to the illustrations when you are setting up and operating the printer.

## Conventions Used in This Manual

**WARNINGS** must be followed carefully to avoid damage to your printer and equipment.

**Cautions** must be followed to ensure that your printer operates correctly.

**Notes** contain important information and useful tips on the operation of your printer.

## Where to Get Help

Customer support and service for Epson products is provided by a network of authorized Epson dealers and service centers throughout the United States. Epson America provides product information and toll-free support to our dealers and service centers.

Therefore, we ask that you contact the business where you purchased your Epson product to request assistance. If they do not have the answer to your question, they can obtain it through our toll-free dealer support program.

We are confident that this policy will provide you with the assistance you need. If you need to find an Epson dealer or service center in your area, please contact our Consumer Information Center at (800) 421-5426.

Chapter 1

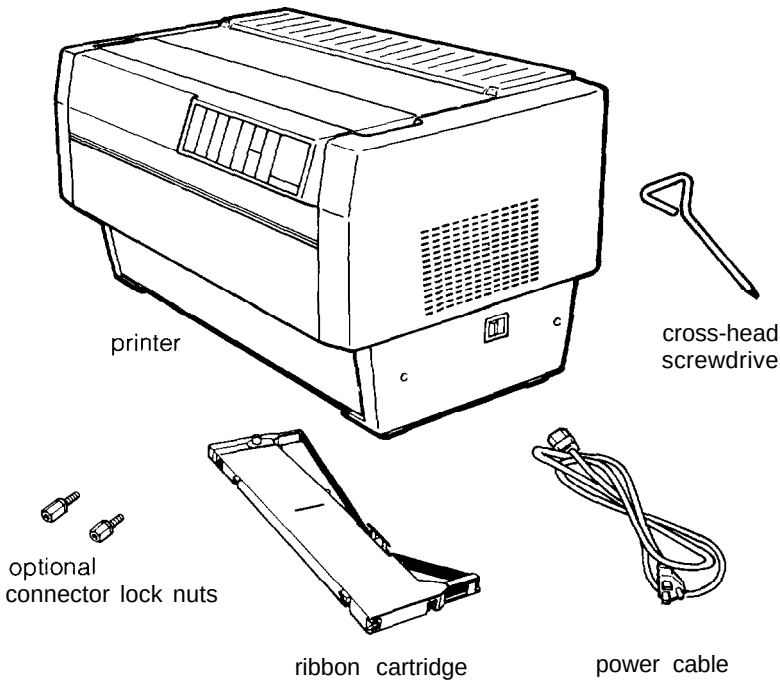
# Setting Up the Printer

## Unpacking the Printer

Because the printer weighs approximately 65 pounds, you should not lift or carry it by yourself. Two people should carry it by the bottom.

### Checking the parts

Check to see that you have the parts shown below and that nothing has been damaged during transportation.

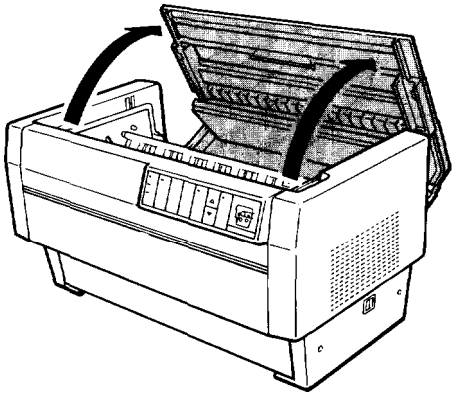



After you unpack the printer, store the packaging materials in case you ever need to transport the printer.

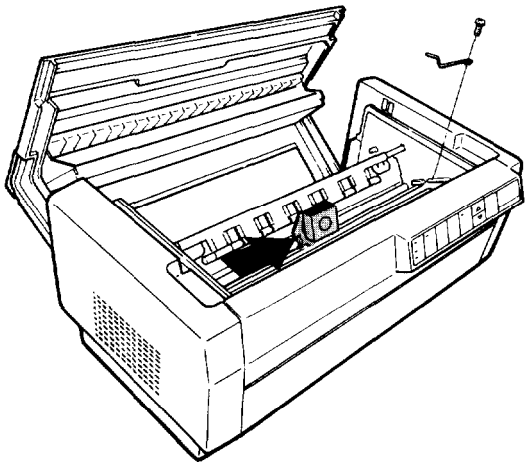
## Removing the protective materials

The printer is protected during shipping by several pieces of foam packaging, two brackets, and a carriage support bar. These protective items must be removed before you turn on the printer. After removing the protective materials as described below, store them with the other packaging material.

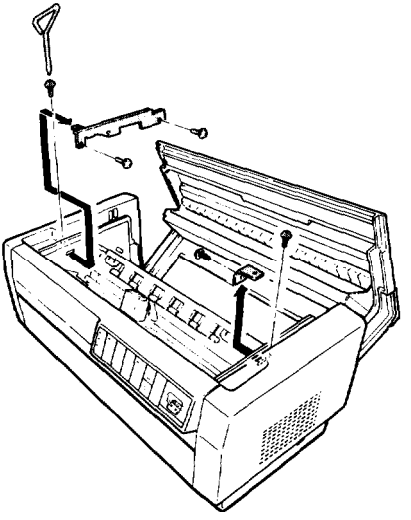
1. Open the printer's top cover and remove the foam packaging material.



2. Using the cross-head screwdriver, remove the carriage support bar and slide the print head to the middle of the printer.



3. Use the cross-head screwdriver to remove the two screws and the two locking brackets from the inside of the printer.



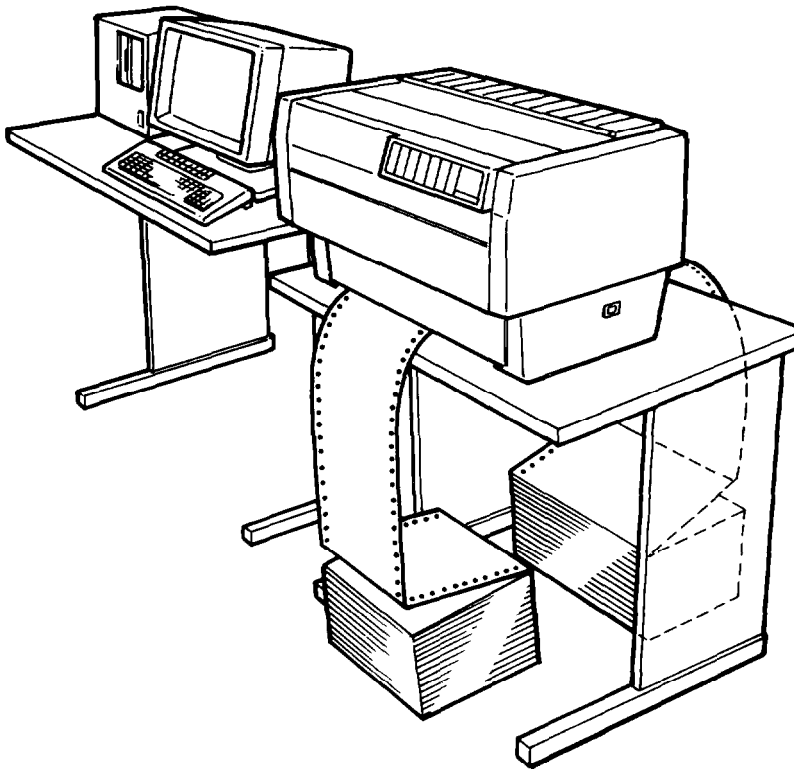
WARNING: Be sure to remove all protective materials before you turn on the printer.

## Choosing a Place for the Printer

When you select a location for your printer, keep the following in mind:

- Place the printer on a flat, stable surface.
- Place the printer close enough to the computer for its cable to reach.
- Leave plenty of room around the printer for your front and rear stacks of continuous paper as well as your printed output.
- Use a grounded outlet; do not use an adapter plug.

The illustration below shows a good printer location.



An optional printer stand designed for the DFX-5000 is also available. See your Epson dealer for details.

**WARNING:**

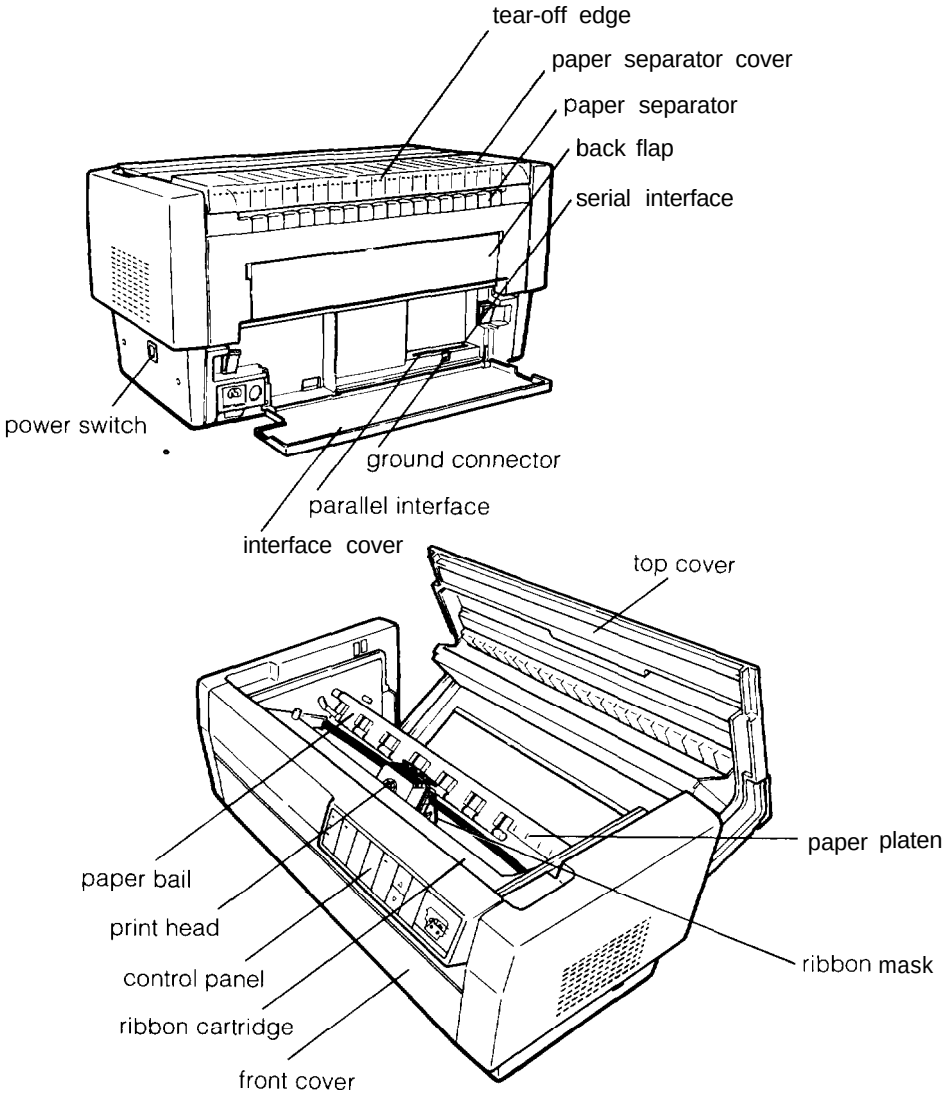
- Avoid locations that are subject to direct sunlight, excessive heat, moisture, or dust.
- Avoid using electrical outlets that are controlled by wall switches or automatic timers. Accidental disruption of power can wipe out information in both your computer's memory and your printer's memory.
- Avoid using outlets on the same circuit with large motors or other appliances that might disturb the power supply.
- Keep the entire computer system away from potential sources of interference, such as loudspeakers or the base units of cordless telephones.

## A Look at Your Printer

Now that you've unpacked the DFX-5000, you may want to use the following information for reference as you assemble and test the printer. This section includes an illustration that shows you the printer's various parts. It also gives you a close-up look at the control panel and indicator lights. See Chapters 2 and 3 for more detailed information on operating your printer.

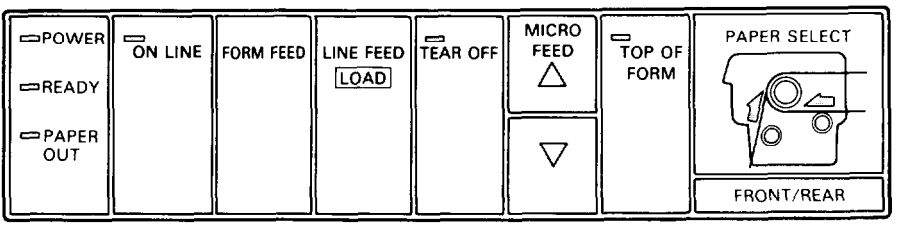
## The printer parts

The following illustration gives you a detailed view of the printer and the names of the important parts. You can refer to this illustration when you set up and operate the printer. This illustration is also on the inside back cover of this manual.



## Control panel indicator lights

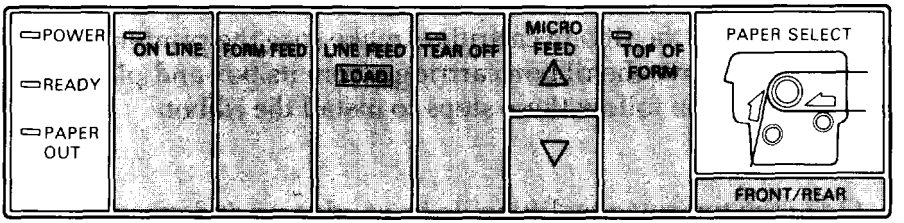
The indicator lights on the control panel let you check the current status of the printer. Below is an illustration of the control panel lights and a description of their functions. These functions are described more fully in Chapters 2 and 3.




| | |
|---|---|
| POWER | On when the POWER switch is on and power is supplied to the printer. |
| READY | On when the printer is on line and ready to accept input data. This light flickers during printing. |
| PAPER OUT | On when the printer is out of paper. |
| ON LINE | On when the printer can receive and print data from the computer. |
| TEAR OFF | On when the printer is in tear-off mode. |
| TOP OF FORM | On when the printer is in top of form mode. |
| PAPERSELECT | **Front tractor arrow:** Green when the front tractor is selected and paper is loaded. Red when the front tractor is out of paper.<br><br>**Rear tractor arrow:** Green when the rear tractor is selected and paper is loaded. Red when the rear tractor is out of paper. |

## Control panel buttons

The buttons on the control panel let you control most of the printer's operations, Below is an illustration of the control panel buttons and a description of their functions. These functions are described more fully in Chapters 2 and 3.




| | |
|---|---|
| ON LINE | Controls the printer's on line/off line status. |
| FORM FEED | Advances paper to the top of the next page when the printer is off line. |
| LINE FEED/LOAD | Advances paper one line when the printer is off line. (Feeds paper continuously if the button is held down.) This button can also be used to load paper when the printer is on line. See Chapter 2 for details. |
| TEAR OFF | Advances paper to its tear-off position and then feeds the paper back to the top of form position. |
| MICRO FEED | Advances or reverses paper in 1/216-inch increments when the printer is off line. These buttons are used to adjust the top of form and tear-off positions. |
| TOP OF FORM | Enters and exits the top of form mode when the printer is off line. |
| FRONT/REAR | Selects the front or rear tractor. |

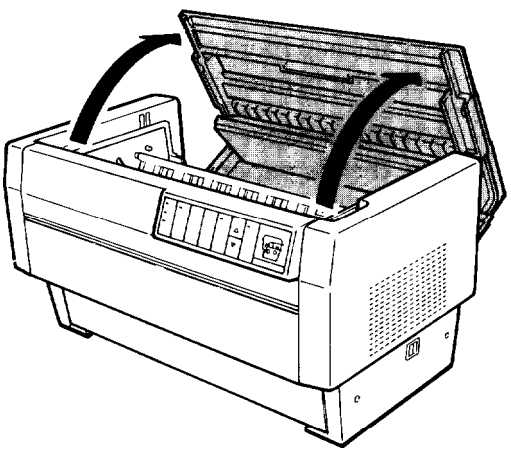
## Assembling the Printer

Since the printer comes almost completely assembled from the factory, all you need to do is install the ribbon cartridge and attach the power cord.

### Installing the ribbon cartridge

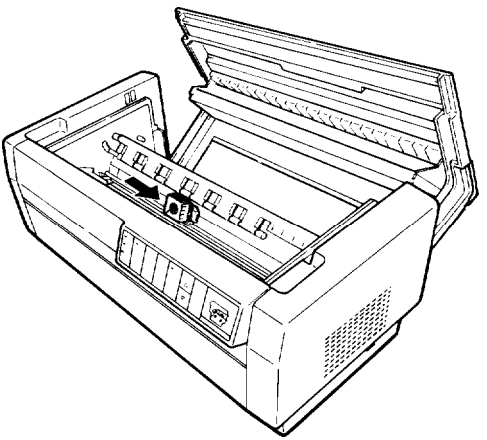
Before installing the ribbon cartridge, make sure the printer is turned off. Remove the ribbon cartridge from its box and plastic wrapper and then follow these steps to install the ribbon cartridge:

1. Open the top cover by lifting its front edge up and away from you.

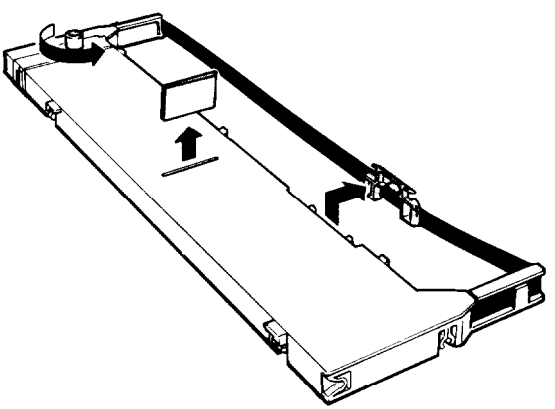


**WARNING:** Never move the print head while the printer is turned on because this can damage the printer. Also, if you have been using the printer, the print head may be hot; let it cool for a few minutes before touching it.

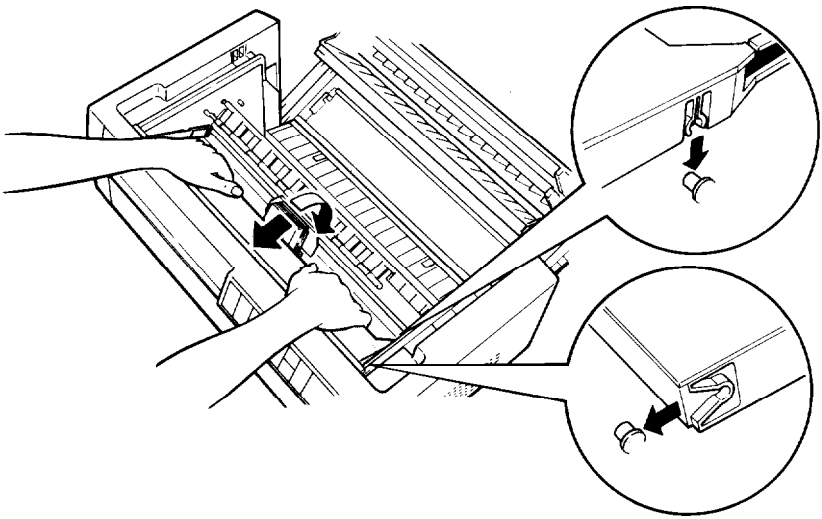
2. Slide the print head to the middle of the printer.



3. Remove the plastic separator from the middle of the ribbon cartridge. (You will not need the separator again and can discard it.) Next, detach the ribbon guide from the cartridge and turn the ribbon-tightening knob in the direction of the arrow to take up any slack in the ribbon.

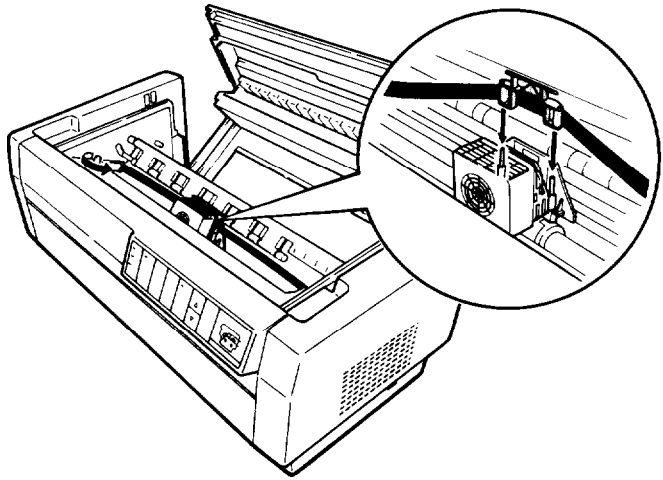


4. Hold the ribbon cartridge with both hands and lower it into the printer as shown below. Pulling the cartridge toward you, slide the hooks nearest you over the corresponding two pins in the printer. Then push the cartridge down into position until the other two hooks snap into place over the mounting pins in the printer.

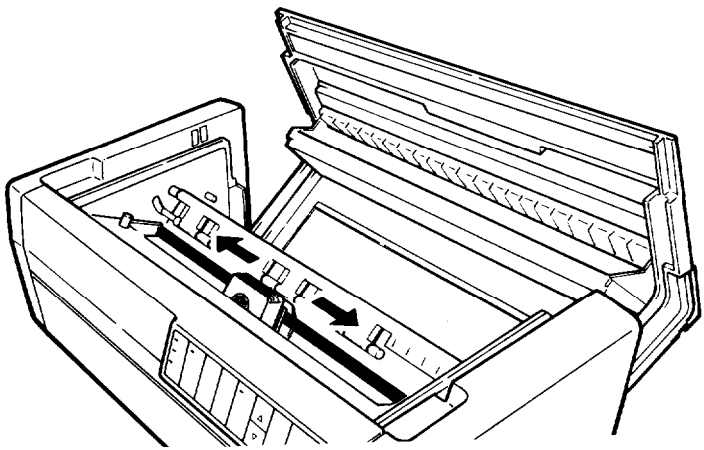


5. Press lightly on both sides of the cartridge to make sure the hooks are properly inserted.

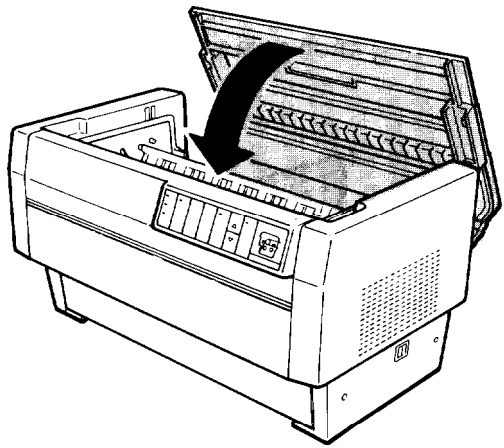
6. Insert the ribbon guide over the metal pins on each side of the print head as shown below. The smaller end of the guide should be on top, with its angled edge toward the platen. Turn the ribbon-tightening knob again to remove any slack in the ribbon.



7. Slide the print head from side to side to see that it moves smoothly and that the ribbon is not twisted or creased.



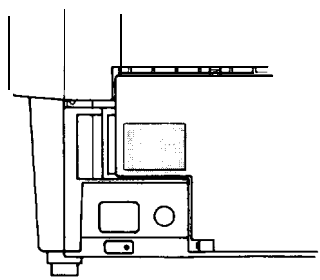
8. Close the printer's top cover.



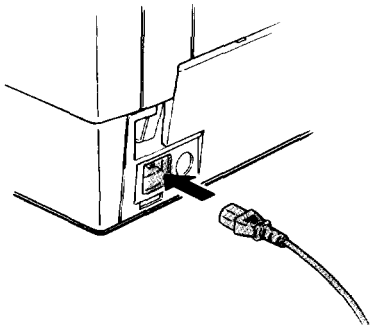
## Attaching the power cable

Follow these steps to attach the power cable:

1. Check the label on the printer's rear panel to see if the voltage required by the printer matches that of your electrical outlet. If it does not match, contact your Epson dealer without connecting the power cable.



2. Plug the power cable into the AC inlet on the printer's rear panel.



**Note:** If you move to another country, you may need to change the voltage of the printer. See your dealer for information.

## Testing the Printer

Now that your printer is fully assembled, you can use your printer's built-in test function to be sure the printer is working correctly before you connect it to a computer.

Before performing the test, you need to plug in your printer and load paper.

### Plugging in the printer

Follow these steps to plug in the printer:

1. Make sure the printer is turned off. (The zero (0) on the power switch should be visible.)
2. Plug the power cable into a properly grounded electrical outlet.

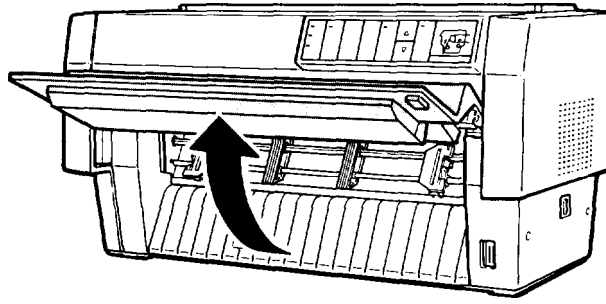
**WARNING:** Whenever you turn off the power, wait at least five seconds before turning it back on. Rapid switching on and off can damage the printer.

## Loading paper for the self test

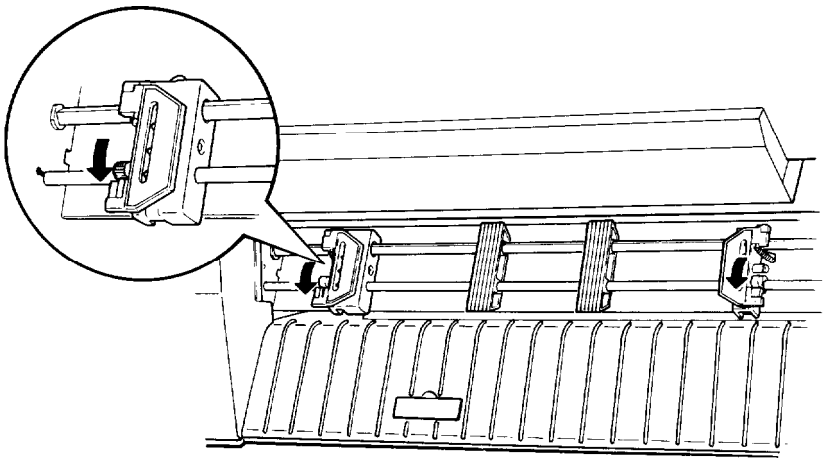
Next, you need to load continuous paper that is at least 15 inches wide. To load paper, follow these steps:

**WARNING:** Use paper that is at least 15 inches wide for the self test to keep the print head from printing directly onto the platen.

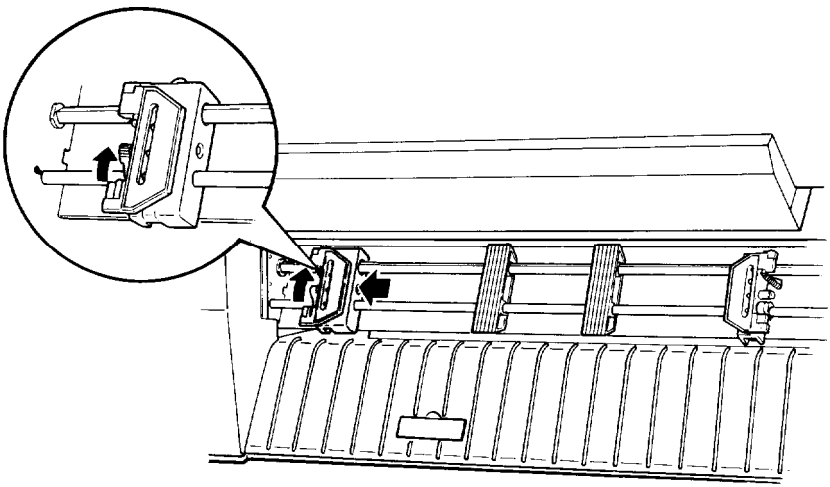
1. Open the printer's front cover by lifting its bottom edge up and toward you, as shown below.



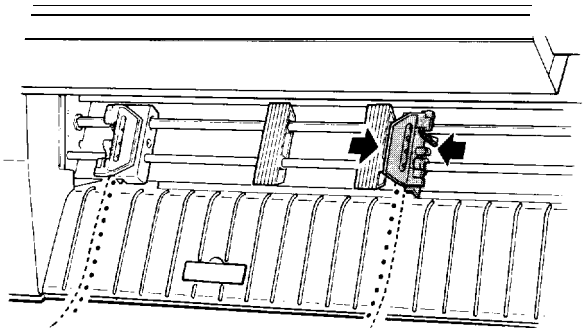
2. Release the sprocket lock levers on both the right and left sprocket units by pulling each lever down.



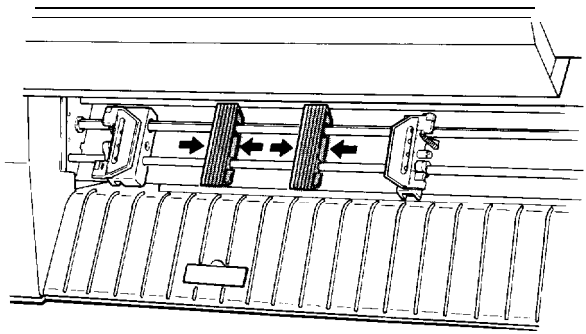
3. Slide the left sprocket unit all the way to the left. Lock it into place by pushing the sprocket lock lever up.



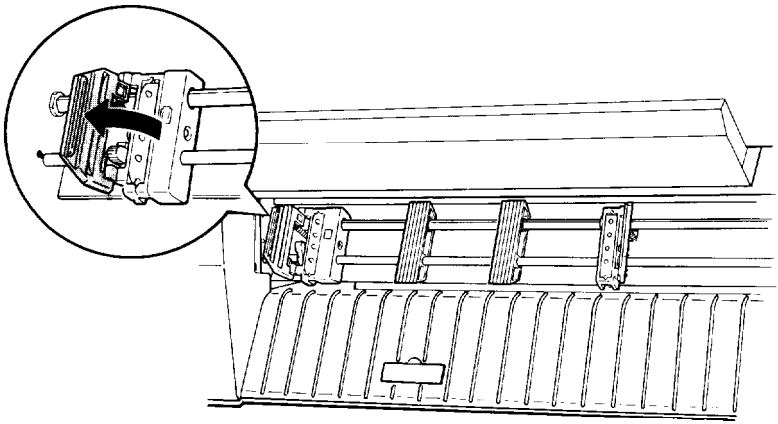
4. Now slide the right sprocket unit to approximately match the width of your paper. (Do not lock it in place yet.)



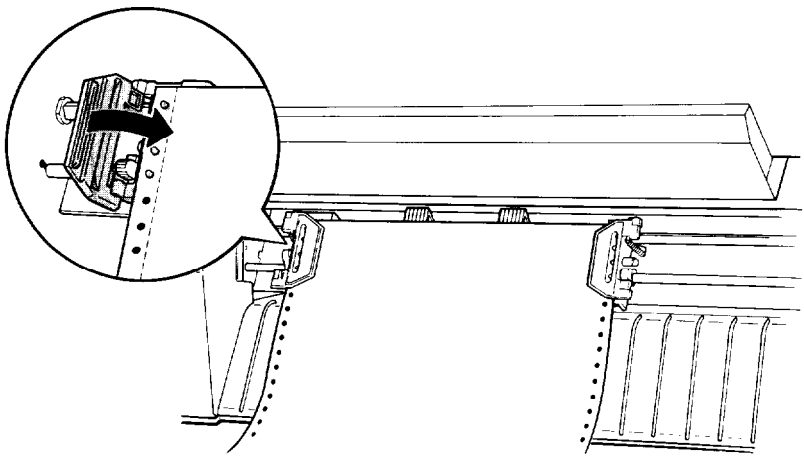
5. Slide the two paper supports so that they are spaced evenly between the sprocket units.



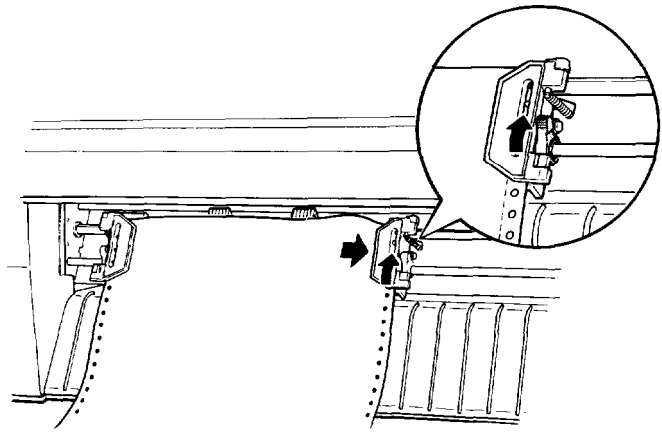
6. Open both sprocket covers.



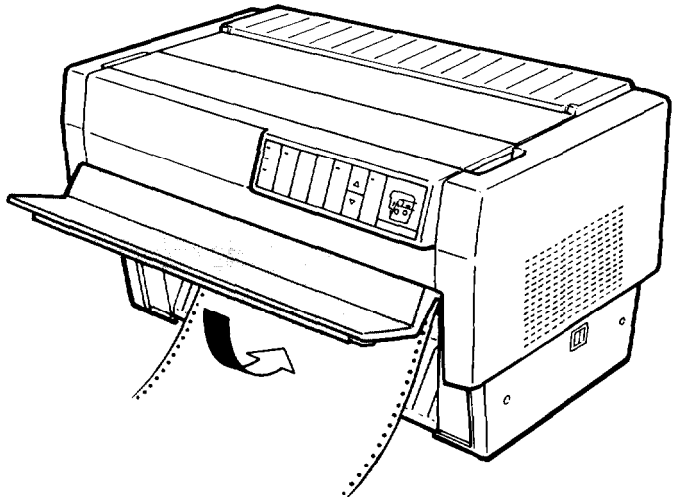
**7.** Be sure your paper has a clean, straight edge, and then fit the first five holes in the paper over the pins of the sprocket units as shown below. The side of the paper that you want to print on should be facing you. Now close the sprocket covers.



**8.** Slide the right sprocket unit so that the paper is straight and has no wrinkles. Lock the sprocket unit in place by pushing the sprocket lock lever up.

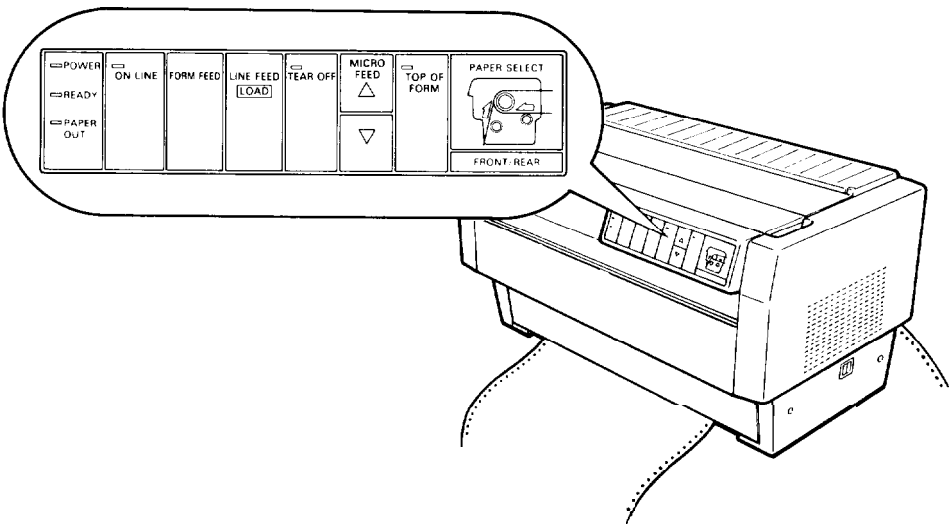


9. Close the printer's front cover.



**WARNING:** Before turning on the printer, be absolutely sure you have removed all protective materials. Turning on the printer while the print head cannot move may seriously damage the mechanism.

10. Turn on the printer. The print head moves to the middle of the printer and the POWER and PAPER OUT lights come on. Also, either the front or rear tractor arrow on the PAPER SELECT indicator lights up.




11. Press the LINE FEED/LOAD button to load your paper. (If the paper does not load, the front tractor may not be selected. Press the FRONT/REAR button to select the front tractor. This loads the paper automatically.)

12. After the paper loads, turn off the printer.

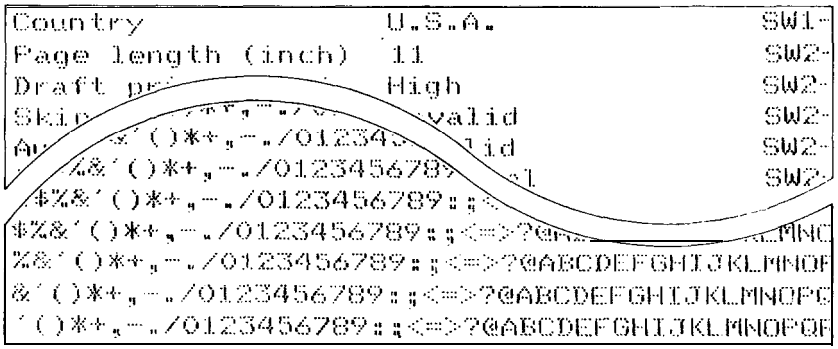
## Running the self test

The self test prints out the settings of the printer's DIP switches and the characters in the printer's memory. The test can be run in either draft,, high-speed draft, or near letter quality (NLQ) mode. Your printer's default setting is high-speed draft mode. To run the self test in high-speed draft mode, follow these steps:

**Caution:** Always use paper that is at least 15 inches wide when running the printer's self test.

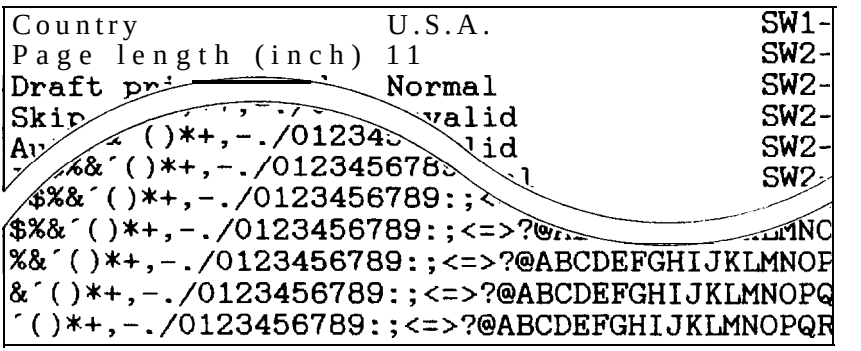
1. While holding down the LINE FEED button, turn on the printer. After printing starts, release the button.

   A list of your printer's settings is printed first, followed by a series of characters. Here is part of a typical self test printout in high-speed draft.

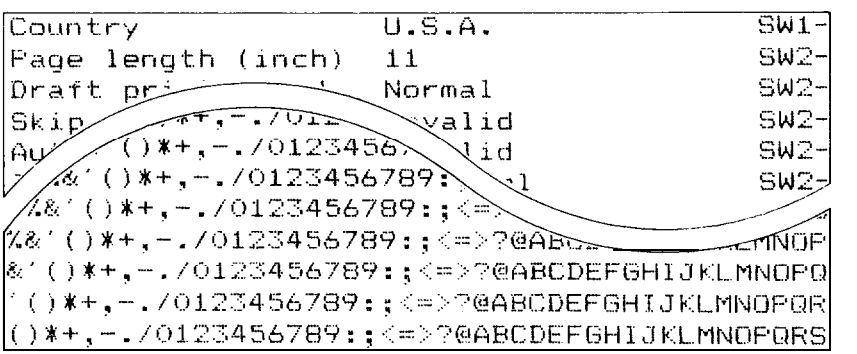



2. The self test continues until the paper runs out or until you press the ON LINE button. If the test results are satisfactory and you wish to stop the test, press the ON LINE button to take the printer off line, and then turn off the printer.

If you want to run the self test in NLQ mode, follow Steps 1 and 2 above using the FORM FEED button instead of the LINE FEED button. Here is part of a self test printout run in NLQ mode:



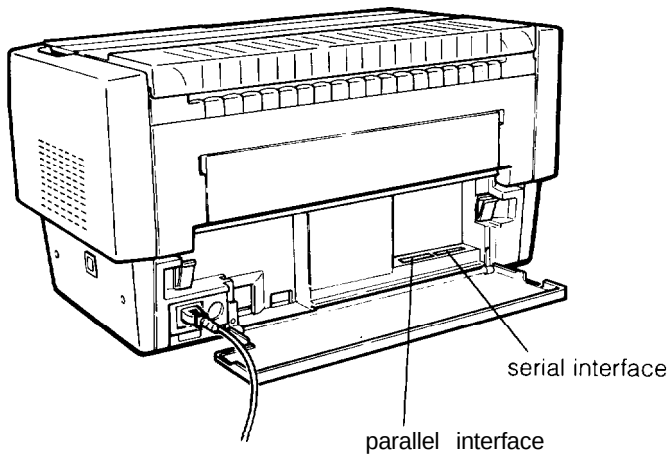

To run the self test in the normal draft mode, you need to first select normal draft mode by changing your printer's DIP switch settings. This procedure is described in the section on setting DIP switches in Chapter 3. Once the printer is set for the normal draft mode rather than high-speed draft, you can run the self test by following the same procedure as for high-speed draft. Here is part of a self test printout run in normal draft mode:



## Connecting the Printer to Your Computer

If the self test printed correctly, you are now ready to connect the printer to your computer.

Your printer has two separate interface connections: a Centronics®-compatible parallel interface and an RS-232C compatible serial interface. If you are not sure which one is required by your computer, check your computer manual.




If you have a suitable shielded cable, you should be able to connect the printer immediately. If you have one of the few computers that requires a different type of interface, you should be able to use one of the optional interfaces described in Chapter 6.

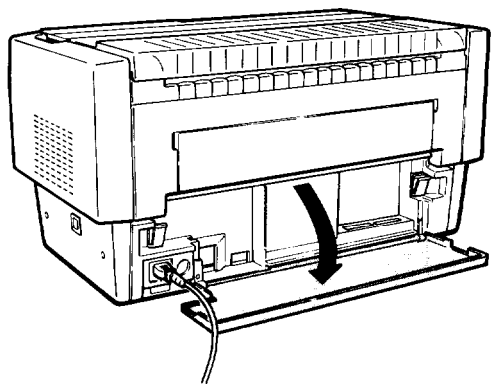
The parallel interface is the printer's default setting. If you need to use the built-in serial interface, be sure to change the DIP switch settings as shown in Chapter 3.

WARNING: Never plug more than one interface cable into the printer at one time. This may damage the printer.

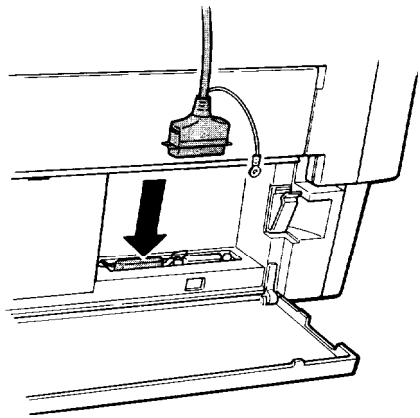
## Connecting the parallel interface

Follow these steps to connect your computer's parallel interface cable to the printer:

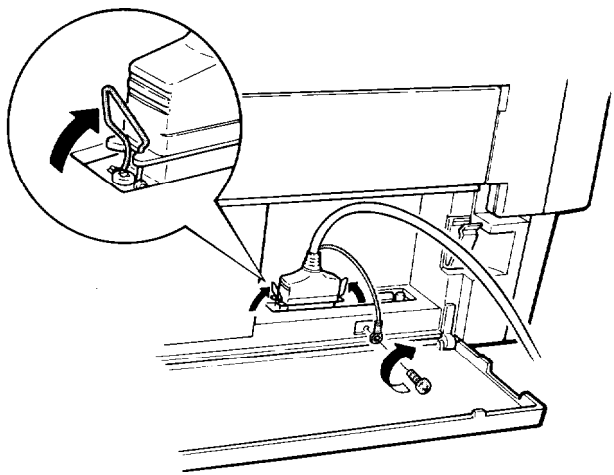
1. Turn off both your printer and computer.
2. Open the printer's interface cover by grasping it by the handholds on each side.



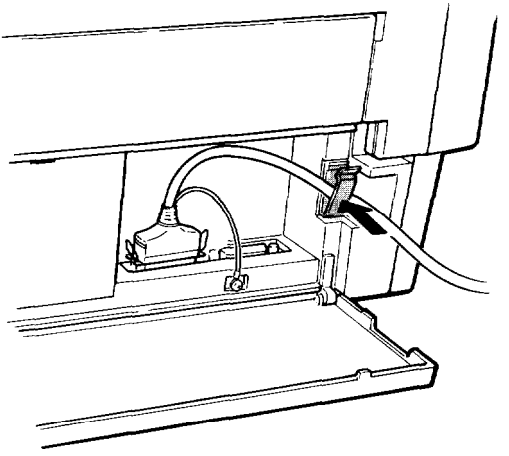
3. Plug the cable connector securely into the parallel interface (the socket on the left).



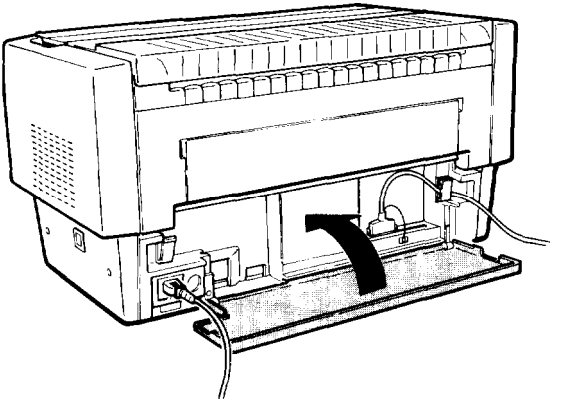
4. Squeeze the wire clips together until they lock in place on either side of the connector. If your cable has a ground wire, connect it to the printer's ground connector.



5. Open the plastic clamp to the right of the parallel and serial interfaces by pressing on its top tab. Insert the cable in the plastic clamp and close the clamp, as shown below.



6. Close the interface cover.



**Caution:** Always close the interface cover before using the printer.

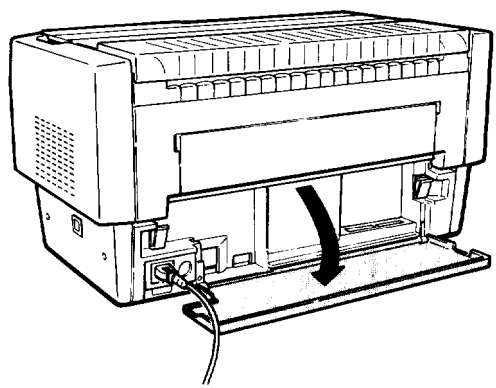
7. Plug the other end of the cable into the computer. (If there is a ground wire at the computer end of the cable, attach it to the ground connector at the back of the computer.)

## Connecting the serial interface

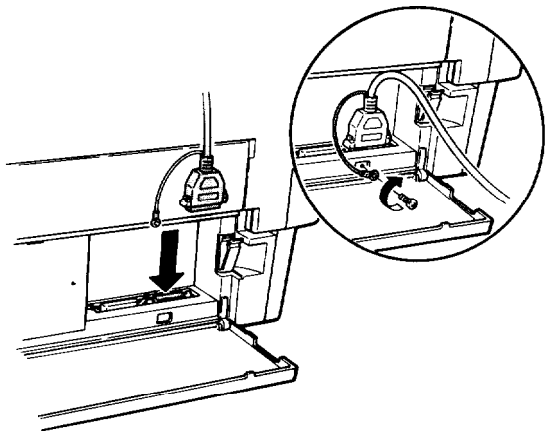
Before using the printer's serial interface, you need to select serial communication by changing the printer's DIP switch settings. You may also need to change two other serial interface settings, baud rate and parity, before your printer and computer can communicate properly. See the section on setting DIP switches in Chapter 3 for more information.

The following steps show you how to connect your computer's serial interface cable to the printer. If the connector on your cable has screws that need to be tightened with a screwdriver, you may need both a cross-head screwdriver and a flat-blade screwdriver to connect the cable.

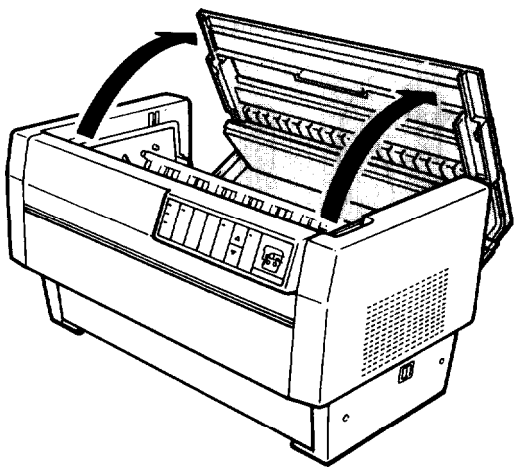
1. Turn off both the printer and computer.
2. Open the printer's interface cover by grasping it by the handholds on each side.



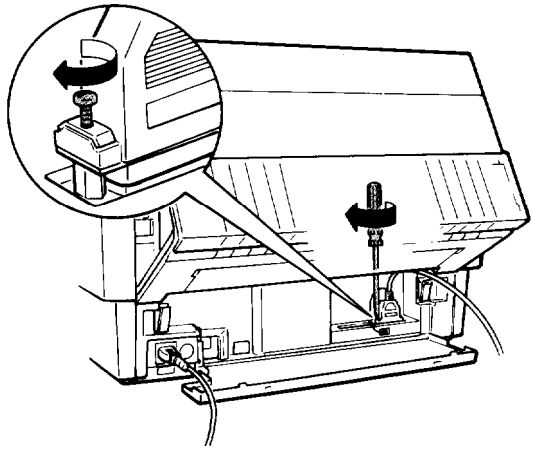
**3.** Plug the cable connector securely into the serial interface (the socket on the right). If your cable has a ground wire, connect it to the printer's ground connector.



**4.** If your cable connector has screws that you have to tighten using a screwdriver, you may need to open the top cover of the printer guide for easier access.

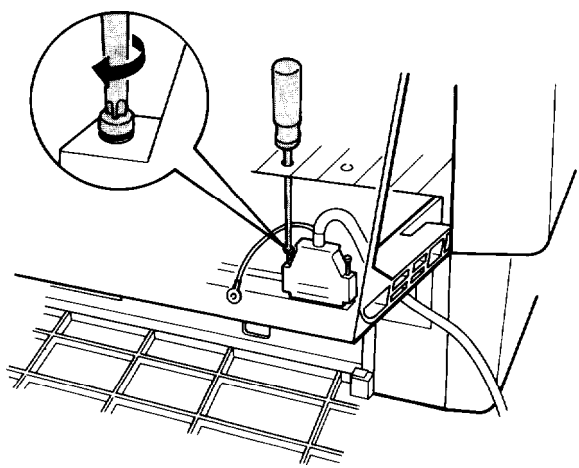


5. **Insert a screwdriver through the two holes and fasten the screws of the cable connector.**

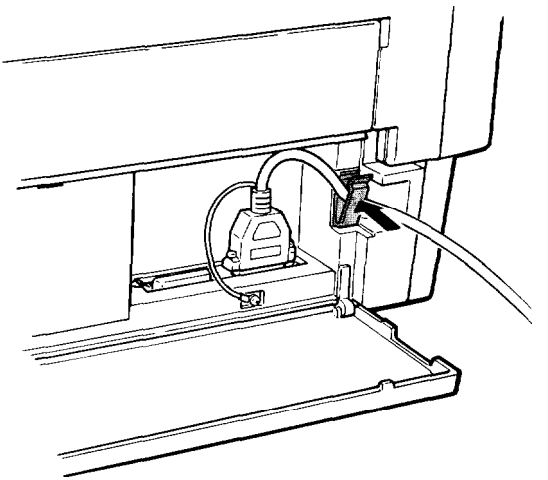


Note: The screws on the serial interface cable connector must fit into connector lock nuts on the printer. If the screws on your serial interface cable do not fit, remove the connector lock nuts on the printer and replace them with the optional ones supplied with the printer.

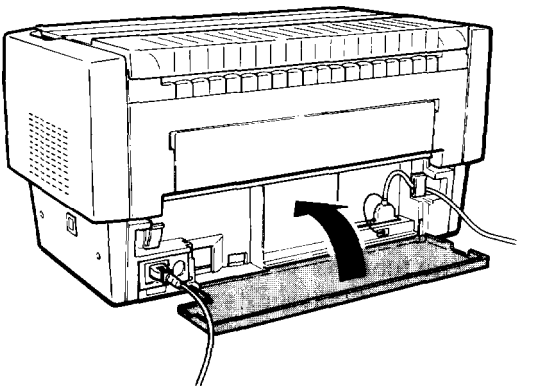
6. **Confirm that the connector is secure**



**7.** Open the plastic clamp on the right by pressing on its top tab. Insert the cable in the plastic clamp, as shown below.



8. Close the interface cover.



**Caution:** Always close the interface cover before using the printer.

9. Plug the other end of the cable into your computer. (If there is a ground wire at the computer end of the cable, attach it to the ground connector at the back of the computer.)

## Setting Up Your Application Software

Now that you have set up and tested the DFX-5000, you can start using it with your application software programs.

Most software programs let you specify the type of printer you are using so that the program can take full advantage of the printer's features. If your application program has an installation or setup procedure that lets you select your printer from a list of printers, choose the Epson DFX-5000 printer. If the list does not include the DFX-5000, choose one of the following printers, listed in order of preference:

FX-850 / 1050
FX-86e / 286e
FX-85 / 185
FX-80 / 100
EX-800 / 1000
FX
LX
Epson printer
9-pin printer
Standard printer
Draft printer

Note: To use all the features of the DFX-5000, it is best to use a program with the DFX-5000 on its menu. If your software program does not list the DFX-5000, contact the software manufacturer to see if an update is available.

Chapter 2

# Loading and Using Paper

## Using the Two-Tractor System

The DFX-5000's paper handling system consists of a front push tractor and a rear push tractor. Both tractors are easy to load and operate, and both accommodate a wide variety of paper types, including labels and multi-part forms. The printer automatically adjusts to the thickness of your loaded paper, so you don't need to make any manual adjustments for paper thickness settings.

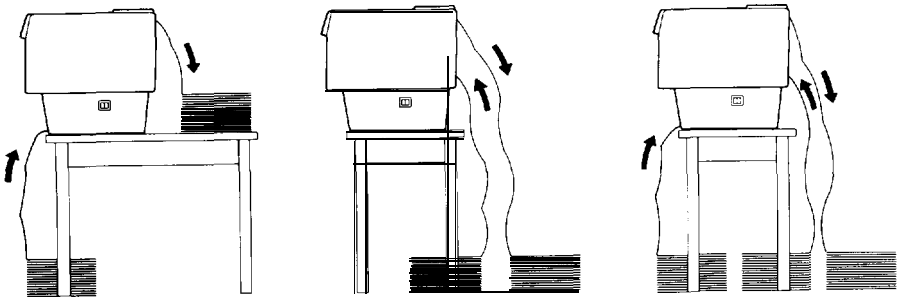
You can use any width continuous paper, from 4 to 16 inches wide. However, the width of your printed text must be narrower than the size of the paper you are using-otherwise, you might damage the printer by printing on the platen.

If you are going to use more than two types of paper, it's best to load the paper you use most often onto the rear tractor. That way you can reserve the front tractor, which is easier to reach, for the paper you change more frequently. Always use the front tractor for printing on labels.

### Positioning the paper supply

Since the DFX-5000 can be loaded with continuous paper from both the front and the rear, be sure to leave enough room around the printer for the two stacks of fresh paper as well a third stack of printed output. It is also important to keep both stacks of fresh paper aligned with the printer so that the paper can feed smoothly into the printer.

The following illustration shows three ways to position your printer and paper: with the front tractor loaded, with the rear tractor loaded, and with both tractors loaded.

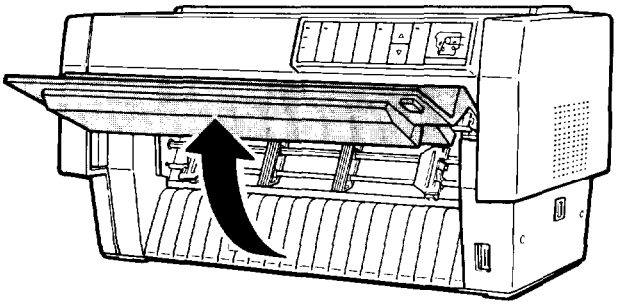


Note: Make sure that your stack of printed pages does not interfere with the rear tractor's paper supply.

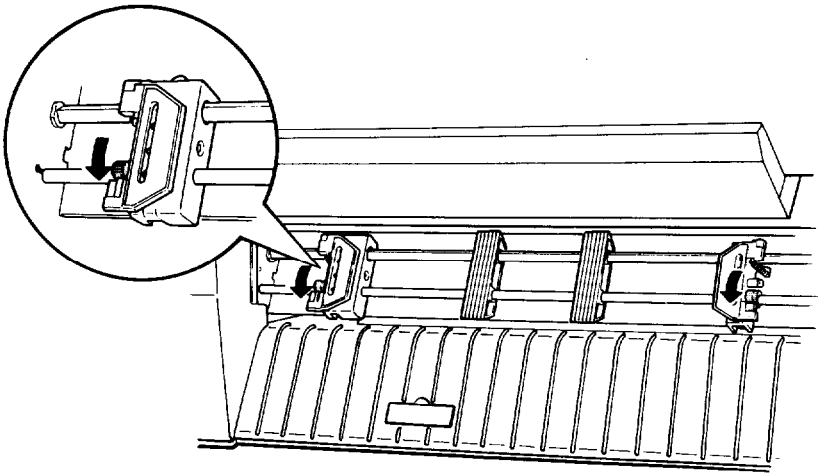
## Loading Paper onto the Front Tractor

The following steps show you how to load paper onto the front tractor.

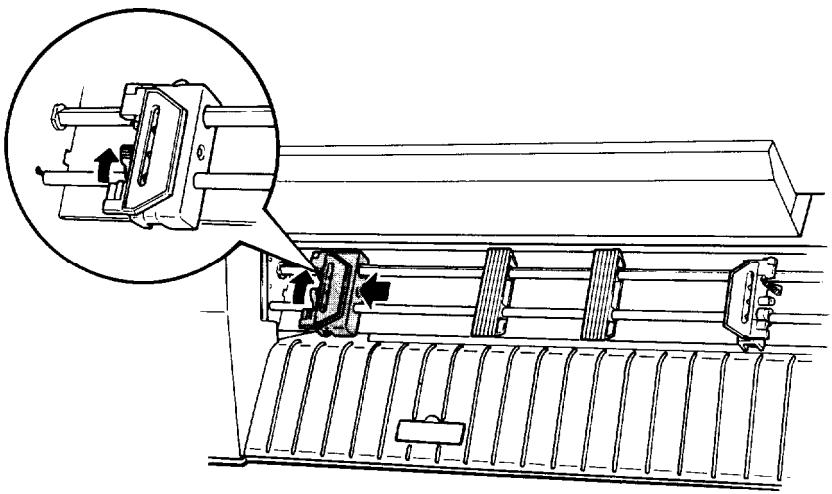
1. Turn off the printer.
2. Open the printer's front cover by lifting its bottom edge up and toward you, as shown below.



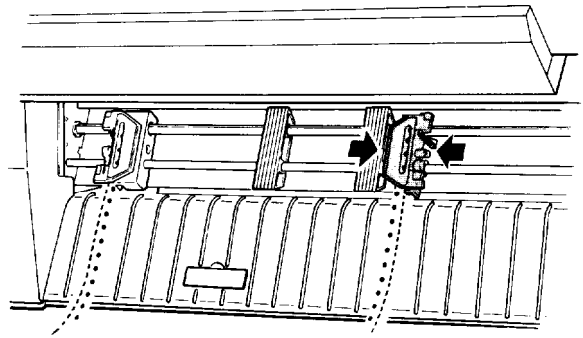
3. Release the sprocket lock levers on both the right and left sprocket units by pulling each lever down.



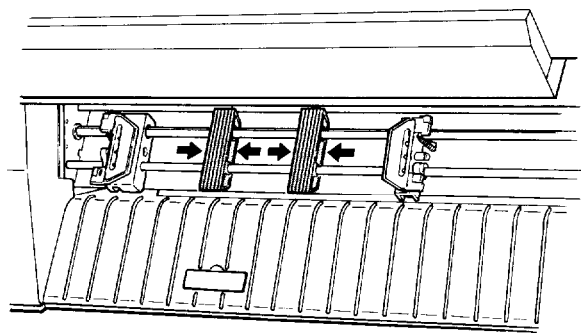
4. Slide the left sprocket unit all the way to the left. Lock it in place by pushing the sprocket release lever up.



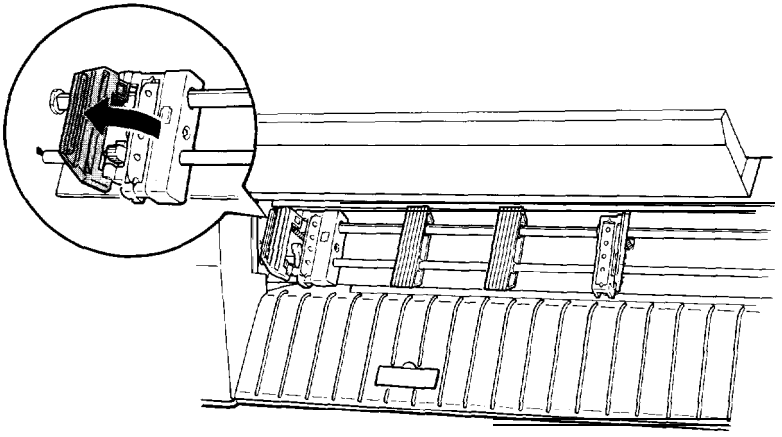
5. Now slide the right sprocket unit to approximately match the width of your paper. (Do not lock it in place yet.)



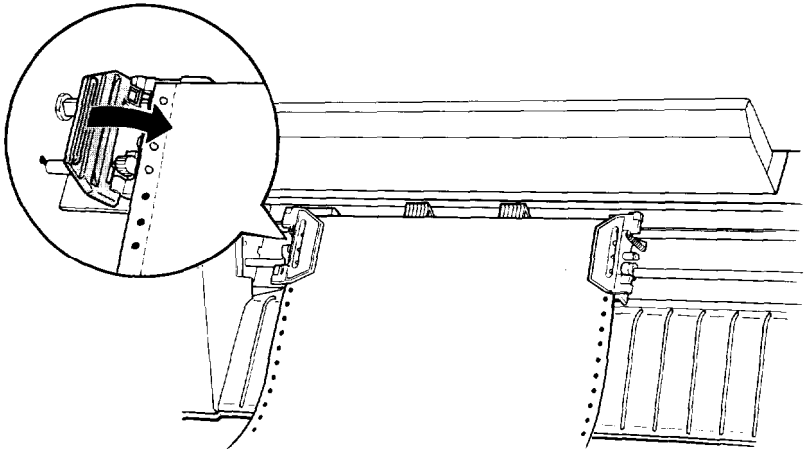
6. Slide the two paper supports so that they are spaced evenly between the two sprocket units.



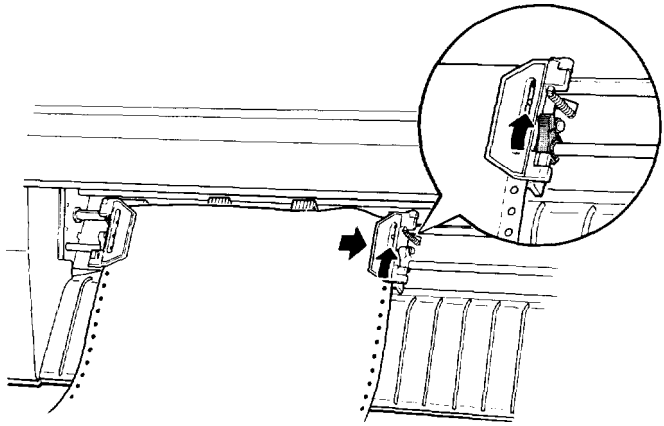
7. Open both sprocket covers.



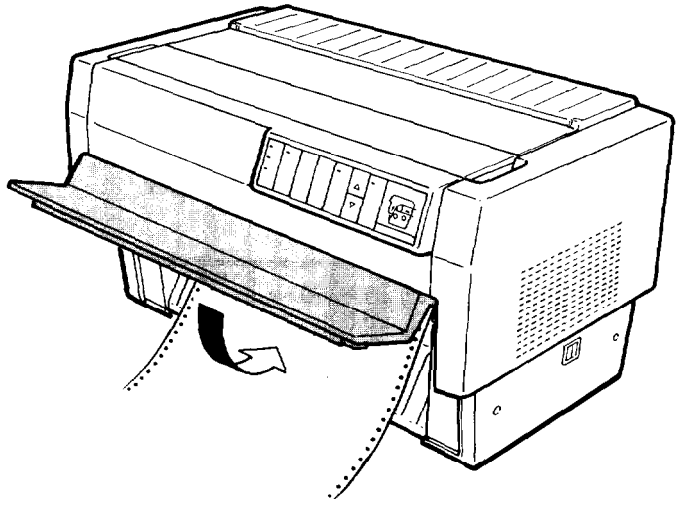
8. Fit the first five holes in the paper over the pins of the sprocket units as shown below. (The side of the paper that you want to print on should be facing you, and the paper should have a clean, straight edge.) Now close the sprocket covers.



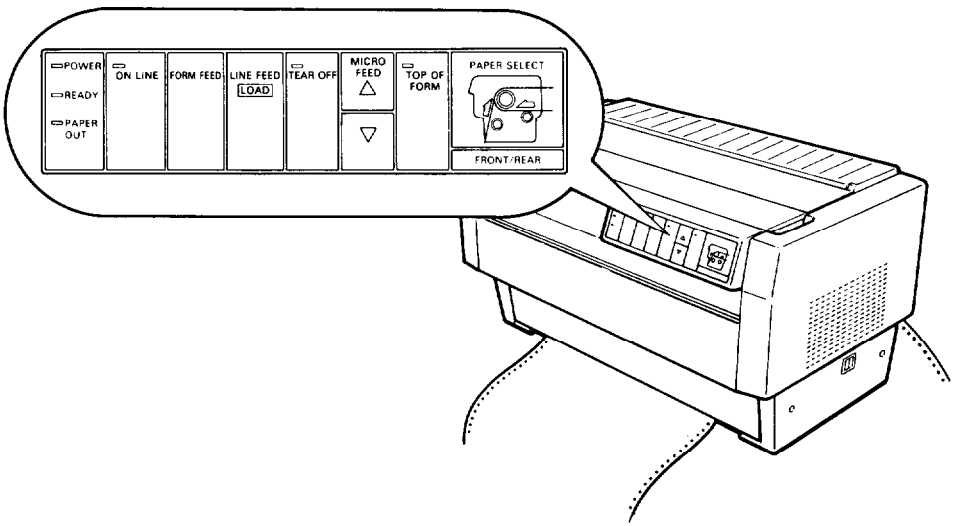
9. Slide the right sprocket unit so that the paper is straight and has no wrinkles. Lock the sprocket unit in place by pushing the sprocket release lever up.



10. Close the printer's front cover. The paper is now loaded to the standby position.

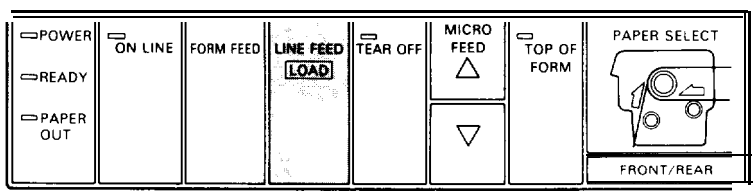


11. Turn on the printer. The print head moves to the middle of the printer and the POWER and PAPER OUT lights go on. Also, either the front or rear tractor arrow on the PAPER SELECT indicator lights up, depending on which tractor was selected when the printer was turned off last.

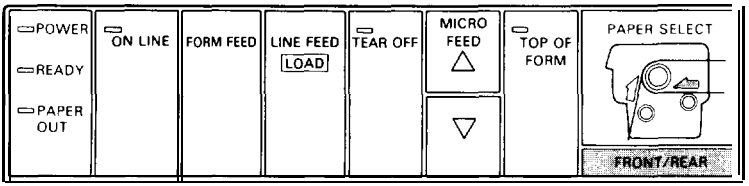



12. Check the PAPER SELECT indicator to see which tractor is selected:

- If the front tractor indicator arrow is lit up, press the LINE FEED/LOAD button to load the paper.



- If the rear tractor indicator arrow is lit up, make sure the printer is off line and then press the FRONT/REAR button to switch to the front tractor. When the printer switches tractors, it also loads the paper automatically.



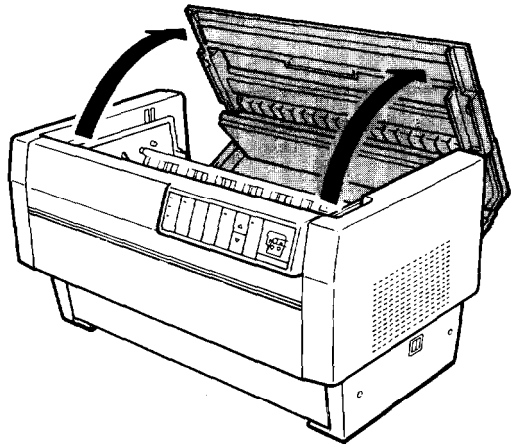

13. Press the ON LINE button to put the printer on line so it is ready to print. The paper is now loaded to the top of form position. If it looks like the printing will start too high or low on the page, see page 2-17 for instructions on adjusting the top of form position.

## Loading Paper onto the Rear Tractor

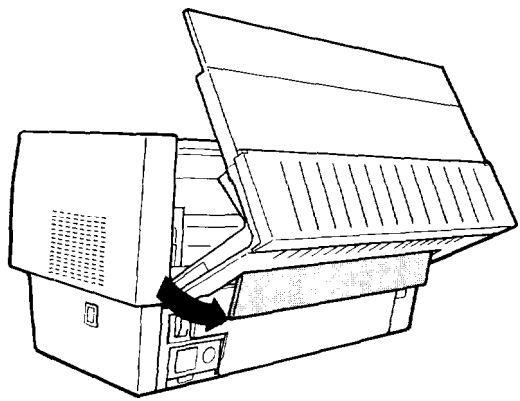
The following steps show you how to load paper onto the rear tractor. You do not need to remove the paper from the front tractor first because the printer does this for you when you select the rear tractor.

1. Turn off the printer.

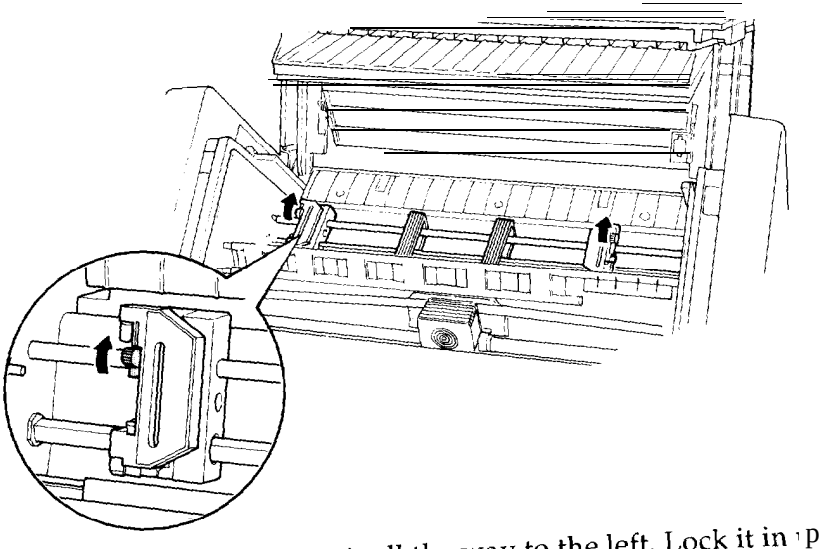
2. Open the printer's top cover by lifting its front edge up and away from you, as shown below.



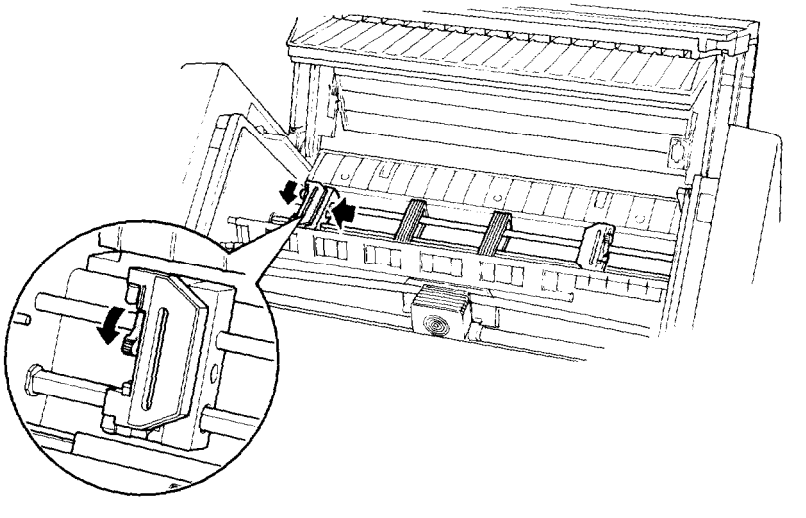
3. The top cover has two flaps that can be opened independently. One flap is on the top part of the cover and the other, shown below, is on the back side. Open the back flap.



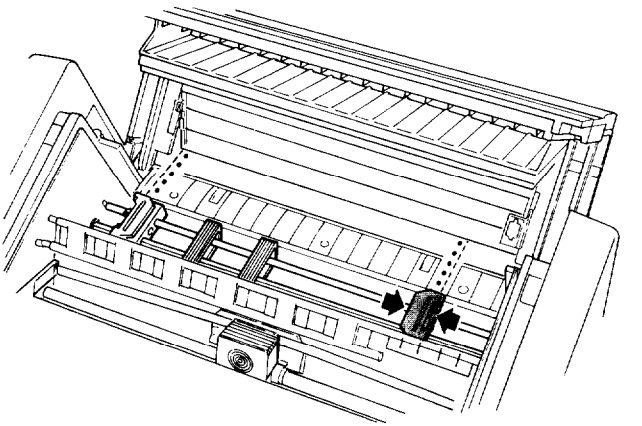
4. Release the sprocket lock levers on the rear tractor's right and left sprocket units by pushing each lever back-



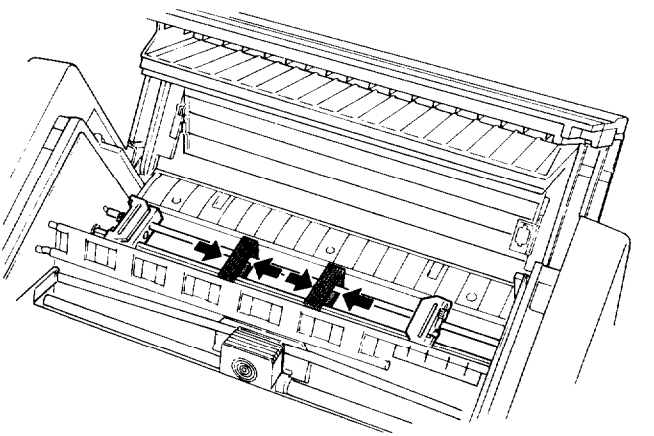
5. Slide the left sprocket unit all the way to the left. Lock it in place by pulling the sprocket lock lever forward.



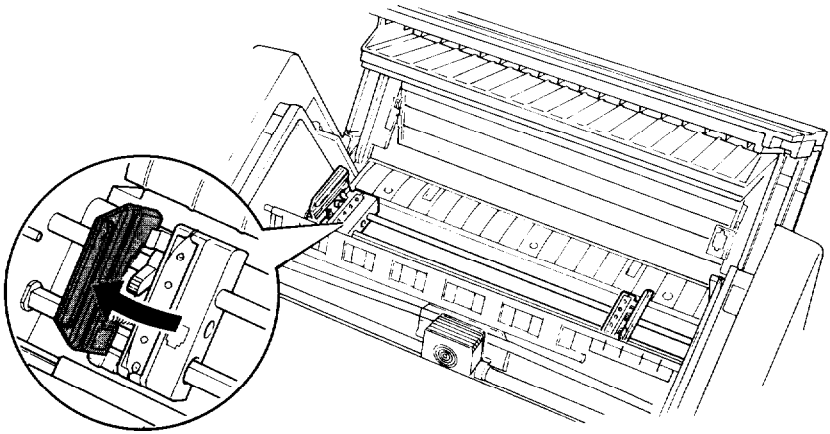
6. Now slide the right sprocket unit to approximately match the width of your paper. (Do not lock it in place yet.)



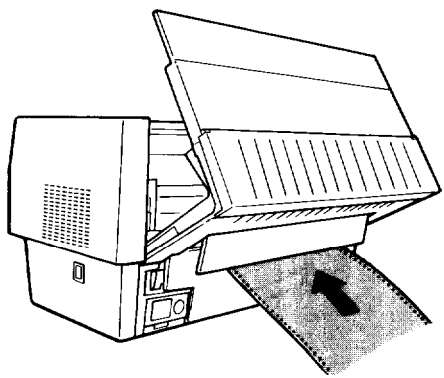
7. Slide the two paper supports so they are spaced evenly between the two sprocket units.



8. Open both sprocket covers.

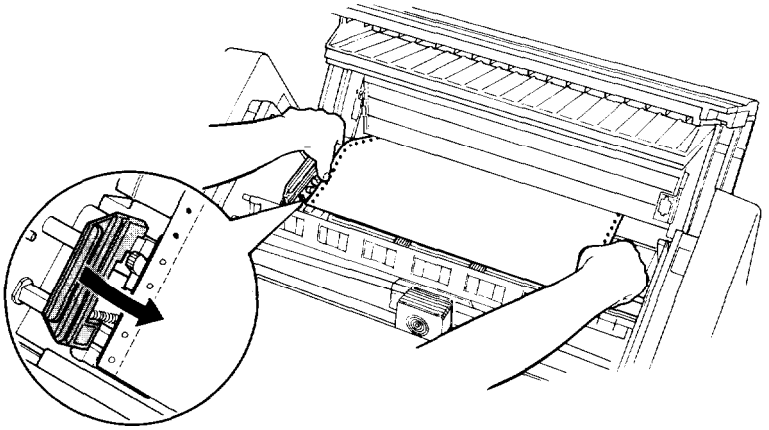


9. With the side of the paper you want to print on facing *down,* insert your paper through the opening at the rear. You may find it easier to load the paper by standing to the side of the printer. That way you can feed the paper into the rear opening with one hand and pull it through with the other.

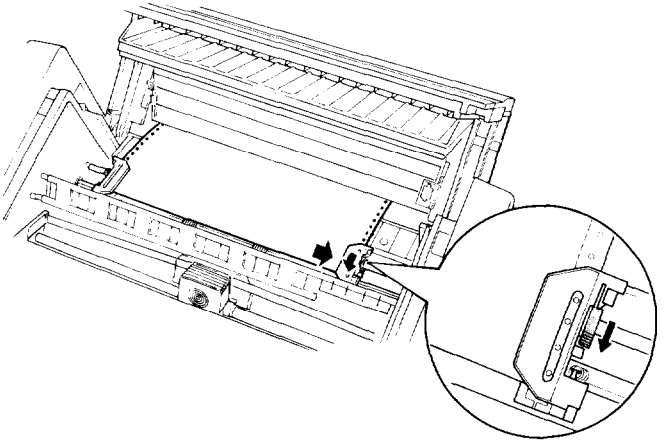


Note: Make sure your paper has a clean, straight edge.

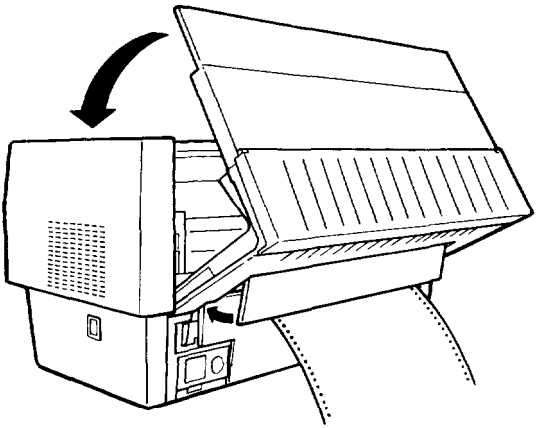
10. Fit the first five holes in the paper over the pins of the sprocket units as shown below. Now close the sprocket covers.



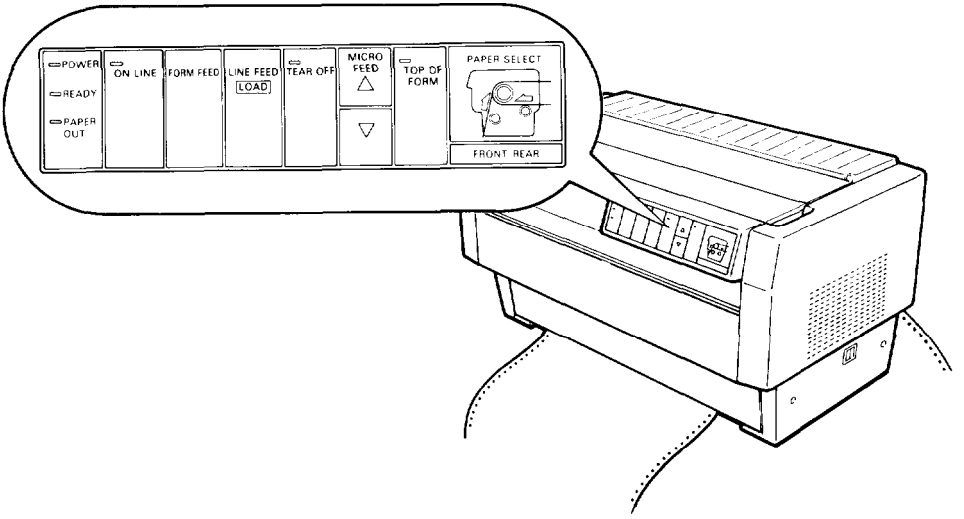
11. Slide the right sprocket unit to a position so that the paper is straight and has no wrinkles. Lock the sprocket unit in place by pulling the sprocket lock lever forward.



12. Close the top cover and the back flap. The paper is now loaded to the standby position.

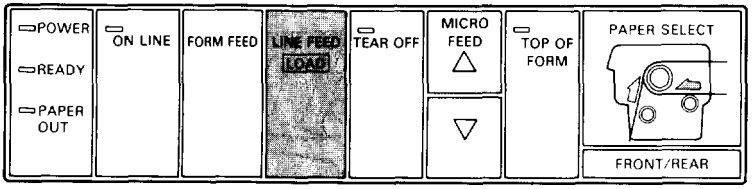


13. Turn on the printer. The print head moves to the middle of the printer and the POWER and PAPER OUT lights go on. Also, either the front or rear tractor arrow on the PAPER SELECT indicator lights up, depending on which tractor was selected when the printer was turned off last.

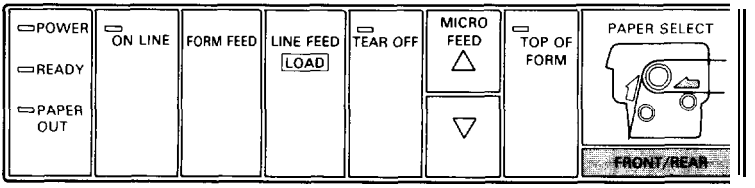


**14.** Check the PAPER SELECT indicator to see which tractor is selected:

- If the rear tractor arrow is lit up, press the LINE FEED/LOAD button to load the paper.




- If the front tractor arrow is lit up, make sure the printer is off line and then press the FRONT/REAR button to switch to the rear tractor. When the printer switches tractors, it also loads the paper automatically.




15. Press the ON LINE button to put the printer on line so it is ready to print. The paper is now loaded to the top of form position. If it looks like the printing will start too high or low on the page, see the next section for instructions on adjusting the top of form position.

## Adjusting the Top of Form Position

The top of form position is the position the printer feeds the paper to when it loads the paper or performs a form feed. This position is important because it determines where the printing begins on each page.

If the printing is too high or low on the page, you can reset the top of form position by following the steps outlined below. The printer remembers the new top of form position even after the printer is turned off, reset, or initialized. (The printer remembers separate top of form positions for the front and rear tractors.)

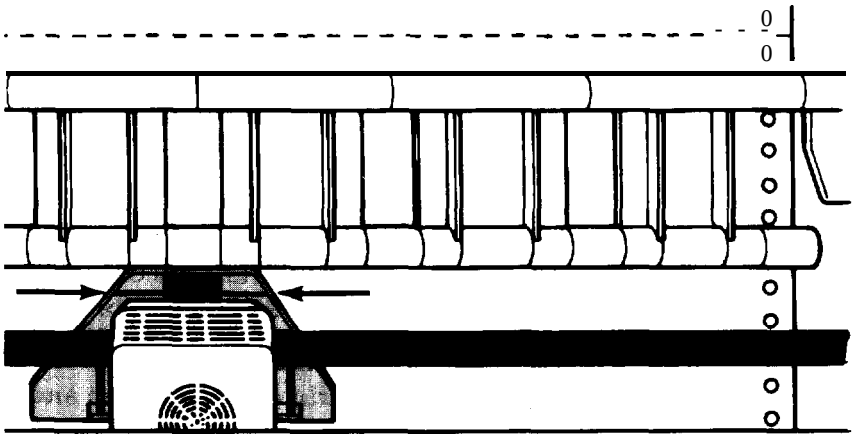
You can temporarily change the top of form position by adjusting the position when you are not in the top of form mode or by changing the printing position in the middle of a page (see the next section). The printer remembers the temporary top of form position until the next time you load paper or switch tractors.

The following steps show you how to reset the top of form position. Before you start, make sure the printer is turned on and the desired tractor is selected (the corresponding tractor arrow should be lit up).

**WARNING:** To adjust the top of form position when labels are loaded in the printer, use the ***forward-feeding*** (top) **MICRO FEED** button only. Labels must never be fed backward through the printer.

1. Make sure the printer is off line.
2. Press the TOP OF FORM button to enter the top of form mode. The printer beeps once, and the TOP OF FORM light starts flashing. Also, the printer advances the paper so that the top of form position is lined up with the red line on the clear plastic ribbon mask.

3. The red line on the ribbon mask shows you where the bottom edge of your first line of text will print. This position is based on the first printable line of text. If your software inserts a top margin of five lines, your text will actually print five lines below the top of form position. Use the MICRO FEED buttons to feed the paper to the desired top of form position.



Note: The red line on the ribbon mask can be used as a reference only when you are in the top of form mode. At all other times your top of form position is hidden behind the print ribbon.

**4.** Press the TOP OF FORM button again to exit the top of form mode and save your new top of form position. (If you want to exit the top of form mode without saving your new top of form setting, press the ON LINE button instead of the TOP OF FORM button.)

5. Press the ON LINE button to put the printer on line. The printer remembers your new top of form position even after the printer is turned off, reset, or initialized.

## Adjusting the Printing Position

For some of your printing, such as preprinted forms and labels, the alignment of your text is critical-not just at the top of form position, but in the middle of the page as well. Rather than calculate where your text will fall based on the top of form position, there's an easier way to position your printing.

When you move the printing position, you temporarily change the top of form position by the same amount. For example, if you adjust the printing in the middle of a page so that it falls a half-inch lower, the next page will begin printing a half-inch lower as well. The printer remembers this temporary top of form position until the next time you load paper or switch tractors.

Follow these steps to adjust your printing position:

1. Start printing your document. When you get to the text that needs to be aligned at a particular spot on the page, press the ON LINE button to stop printing.

   Note: You may find it easier to stop your document at the right spot if you use a slower printing speed. See the section in Chapter 3 on selecting the NLQ mode with DIP switches.

2. The printing position is normally hidden behind the ribbon. To see the position better, press the TOP OF FORM button. This advances the paper slightly so that the printing position lines up with the red line on the clear plastic ribbon mask.

3. Use the MICRO FEED buttons to position your paper to where you want the bottom edge of your next line of text to fall. If you are printing on labels, use only the *forward-feeding* (top) MICRO FEED button.

4. When you are finished, press the ON LINE button to exit the top of form mode. (Do not press the TOP OF FORM button to exit the top of form mode. If you do, the printer remembers your new printing position as the new top of form position instead.)

## Using Automatic Tear-Off

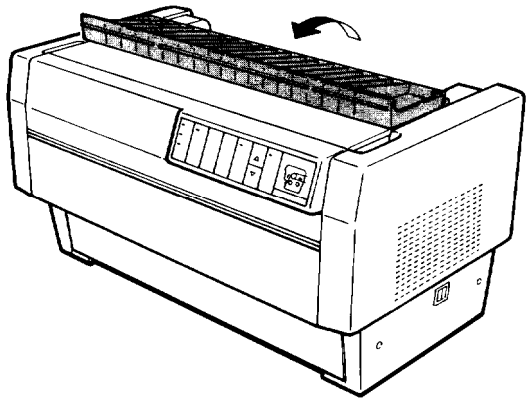
The TEAR OFF button lets you feed the perforation of your paper to the printer's tear-off edge when you are finished printing. This makes it easier to tear off the last printed sheet and saves paper normally lost between documents.

If you need to adjust the position of the perforation so that it meets the printer's tear-off edge, you can reset the tear-off position by entering the tear-off mode and using micro-feed. The printer remembers this new tear-off position and uses it as a reference point for feeding the paper. (The printer remembers separate tear-off positions for the front and rear tractors.)

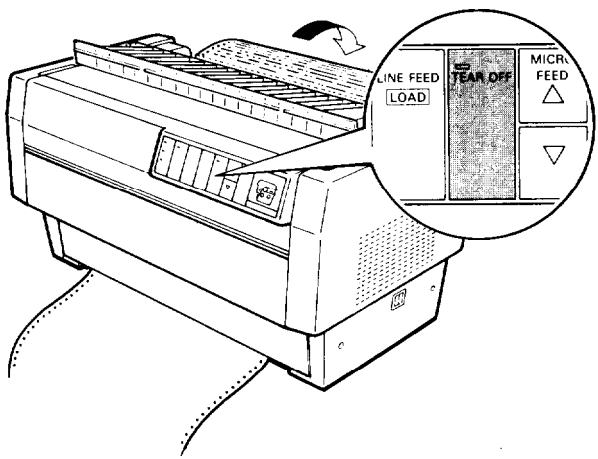
The following steps show you how to use the automatic tear-off feature. Before you start, make sure that the printer is turned on and the desired tractor is selected.

**WARNING:** Never use the TEAR OFF button with labels. If labels are fed backward, they may jam the printer.

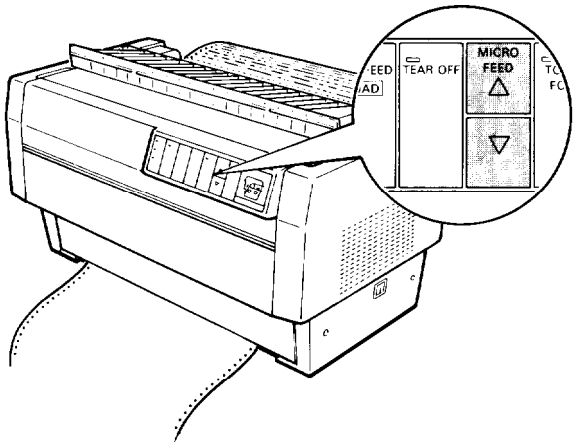
1. If the printer is on line, press the ON LINE button to take it off line. Now open the paper separator cover (the flap on the top part of the printer's top cover). This exposes the printer's tear-off edge.



2. Press the TEAR OFF button to enter the tear-off mode. The TEAR OFF light goes on and the printer feeds the paper's perforation to the printer's tear-off edge.

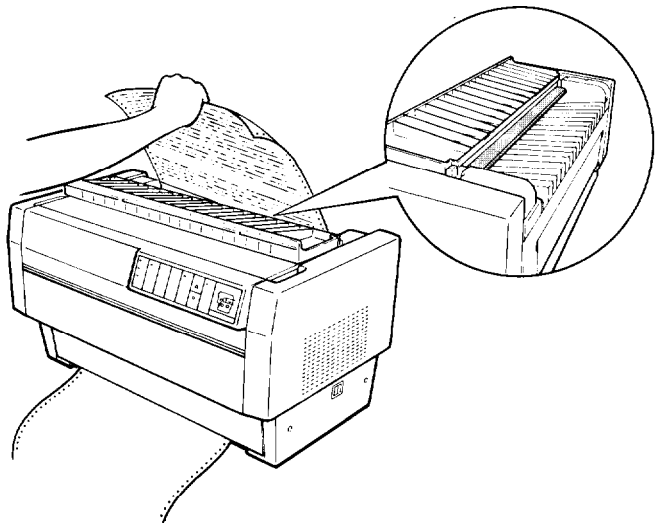


3. If you need to adjust the position of the perforation so that it meets the printer's tear-off edge, press the MICRO FEED buttons to feed the paper forward or backward in 1/216th-inch increments. (You can also hold down either MICRO FEED button to feed the paper continuously.)




Note: You can reset the tear-off position only when you are in the tear-off mode (after you have pressed the TEAR OFF button once and the TEAR OFF light is on). The printer remembers the new tear-off position even after the printer is turned off, reset, or initialized.

4. Tear off the page using the tear-off edge on the printer's top cover.



5. Press the TEAR OFF button to feed the paper back to the top of form position, and then press the ON LINE button to put the printer on line so it is ready to print. (Or instead, press the ON LINE button to feed the paper back and put your printer on line at the same time.)

**WARNING:** Always tear off the printed document before you feed the paper back to the top of form position. Never feed paper backward more than one page.

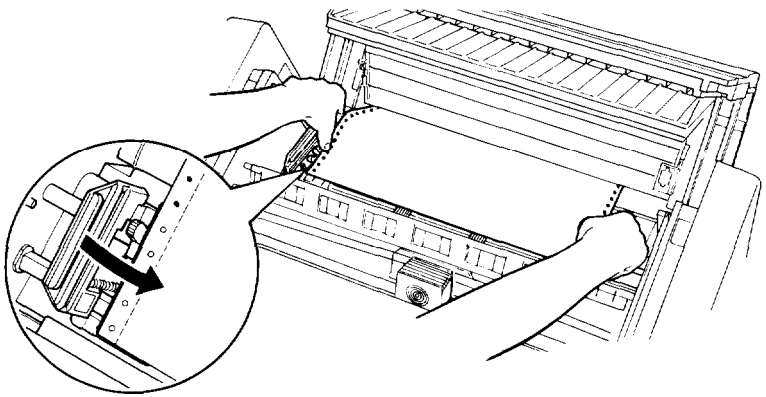
## Switching Between Front and Rear Tractors

You can easily switch between paper loaded on the front tractor and paper loaded on the rear tractor. The following steps describe the procedure for switching from the front tractor to the rear tractor, but you can follow the same steps to switch from the rear tractor to the front tractor. (To switch tractors when the optional pull tractor is installed, see Chapter 6.)

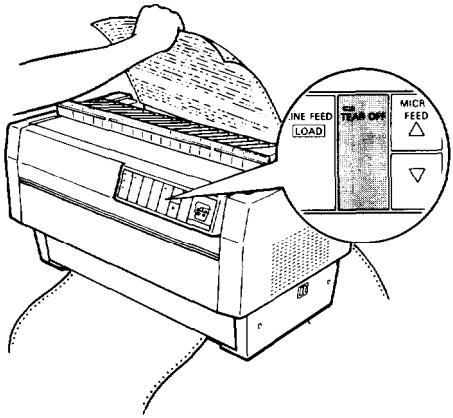
WARNING: Never switch between tractors when labels are already loaded in the printer. Instead, completely remove the labels first by tearing off the fresh supply below the tractor and pressing FORM FEED or LINE FEED to eject the remaining labels.

Before you start, make sure the printer is turned on and that the front tractor is selected (the front tractor arrow on the PAPER SELECT indicator should be lit up). If you are in the middle of printing a document, wait for the printer to finish printing before you switch tractors. Then follow these steps:

1. If there is no paper loaded in the rear tractor, load paper to the standby position (the first five pins of the sprocket units), as described in Steps 1 through 13 on page 2-9.



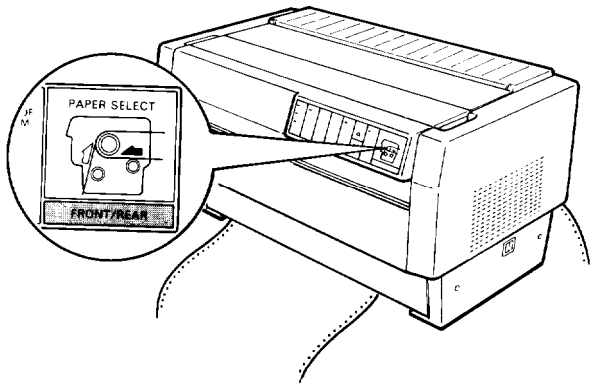
2. If you have a printed document still in the printer, or excess paper that has been fed through the printer, use the automatic tear-off feature described in the previous section to tear off the document or excess paper.




**WARNING:** Always tear off the printed document and any excess paper that has been fed through the printer before switching tractors. Never feed more than one page backward through the printer.

3. If the printer is on line, press the ON LINE button to take it off line.

4. Press the FRONT/REAR button to switch to the rear tractor. The front-loaded paper automatically feeds back to the standby position and the rear-loaded paper is advanced to the top of form position.




5. Press the ON LINE button to put the printer back on line so it is ready to print.

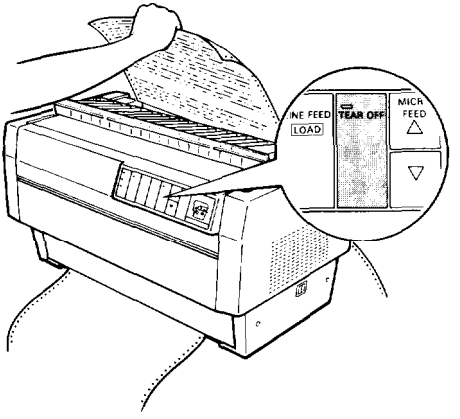
## Changing the Paper

The following steps describe the procedure for changing paper on the front tractor, but you can follow the same steps when you change the paper on the rear tractor.

Before you start, make sure the printer is turned on and the front tractor is selected. (If you are changing the paper on the rear tractor, the rear tractor should be selected instead.)

**WARNING:** Never change paper using the following procedure if labels are already loaded in the printer. Instead, completely remove the labels first by tearing off the fresh supply below the tractor and pressing FORM FEED or LINE FEED to eject the remaining labels. Then load the new paper as described earlier in this chapter in the sections on loading paper.

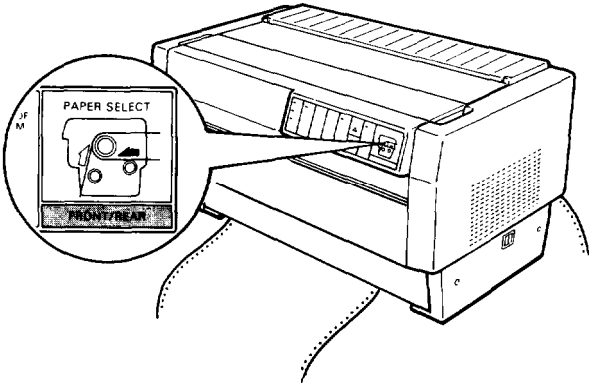
1. If you have a printed document still in the printer, use the automatic tear-off feature described on page 2-20 to tear off the document or excess paper.



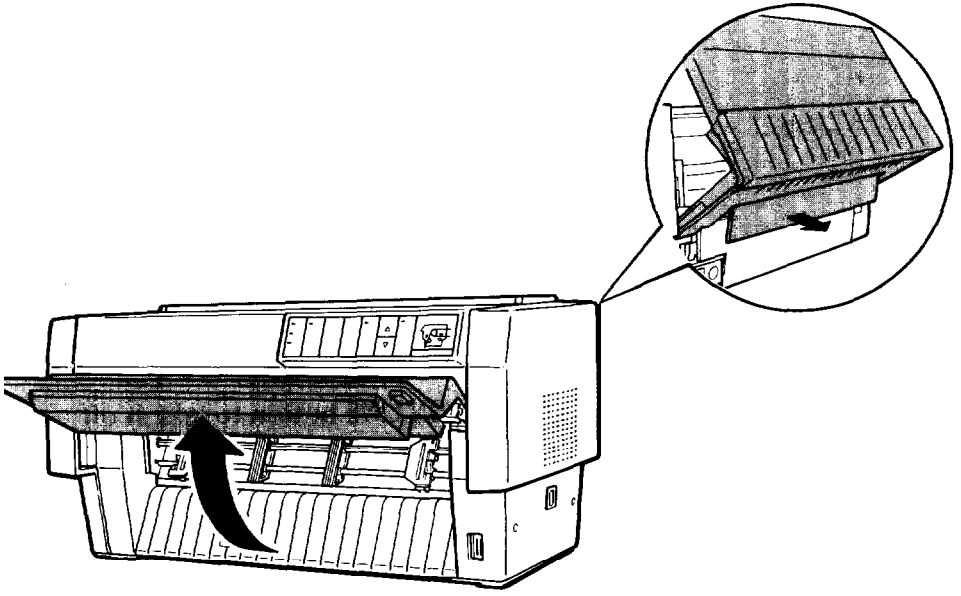

**WARNING:** Always tear off printed documents before changing the paper. Never feed more than one page backward through the printer.

2. If the printer is on line, press the ON LINE button to take it off line.

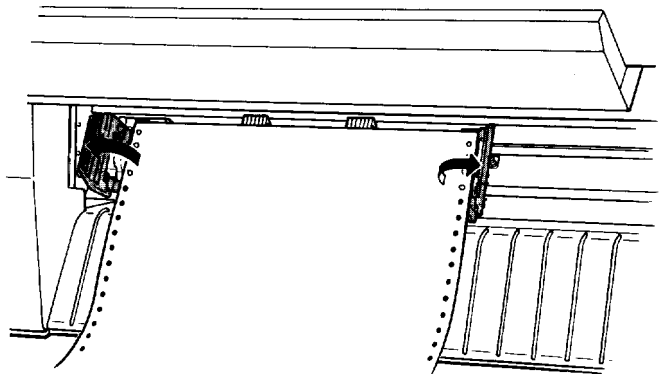
3. Press the FRONT/REAR button to switch to the rear tractor. The front-loaded paper automatically feeds back to the standby position.



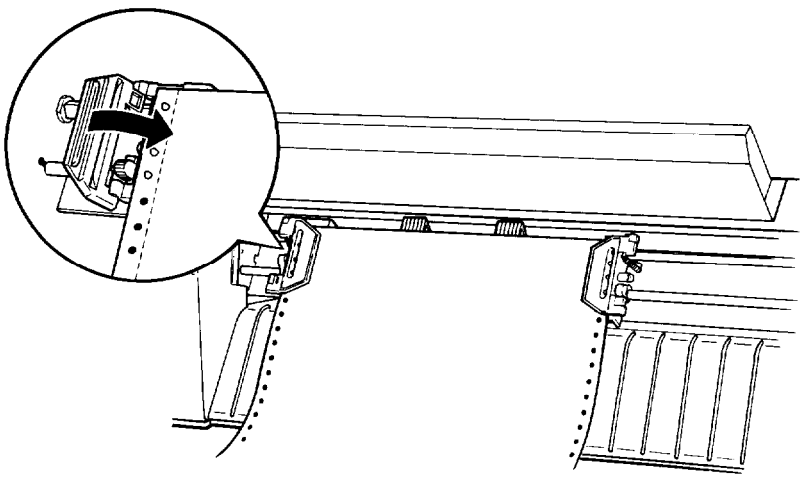

4. Open the printer's front cover. (To change the rear-loaded paper, open the printer's top cover and the back flap.)



5. Open the sprocket covers and remove the paper from the tractor.



6. Load the new paper as described in Steps 1 through 13 on page 2-3 (or for rear-loaded paper, Steps 1 through 15 on page 2-9).



## Printing on Special Paper

The DFX-5000 can print on various types of paper, including multi-part forms and labels. It can also handle a variety of paper thicknesses, from thin paper to six-part forms. The printer automatically adjusts to the thickness of your paper.

When you print on multi-part forms and labels, the positioning of your text on the page can be critical. For more information on aligning your text, see the sections on adjusting top of form and printing positions earlier in this chapter. You should also check both your printer and your software page length settings before you load labels or forms. See the section on setting page length in Chapter 3.

If you are using labels or preprinted or multi-part forms, you may want to use the optional pull tractor. See Chapter 6.

WARNING: When printing on multi-part forms or labels, be absolutely sure that your printing stays within the printable area of the paper to prevent damage to the print head. For more information on the printable area, see Appendix B.

### Using multi-part forms

You can use multi-part forms with up to four sheets, including the original, on the rear tractor. On the front tractor, you can use forms with up to six sheets.

You load continuous multi-part forms the same way you load any other type of continuous paper. Before loading multi-part forms, however, make sure the paper has a clean straight edge and does not separate or tear apart. See the sections on loading paper earlier in this chapter.

## Using labels

When using labels in the DFX-5000, always choose the type mounted on continuous paper with sprocket holes for use with a tractor. Labels should be used in the front tractor only. You load labels the same way that you load continuous paper. See the section on loading paper onto the front tractor earlier in this chapter.

**WARNING:** Never use the TEAR OFF, FRONT/REAR, or reverse-feeding (bottom) MICRO FEED button when labels are loaded in the printer. Labels must never be fed backward through the printer because they can easily come off the backing and jam the printer.

Although you must never feed labels backward through the printer, you can still use the DFX-5000's automatic paper handling features if you follow these precautions:

- Instead of using the TEAR OFF button to remove printed labels, take the printer off line and press the FORM FEED or LINE FEED button until the last printed label is at the point where you can tear it off easily.
- Before using the FRONT/REAR button to switch tractors or change paper, remove the entire supply of labels first. Always remove labels by tearing off the fresh supply at a perforation *below* the tractor and then pressing the FORM FEED or LINE FEED button to eject the remaining labels.
- When adjusting the top of form or printing position, use only the forward-feeding (top) MICRO FEED button.

**WARNING:** Because labels are especially sensitive to extreme temperatures and humidity, always use them under normal operating conditions.

Chapter 3

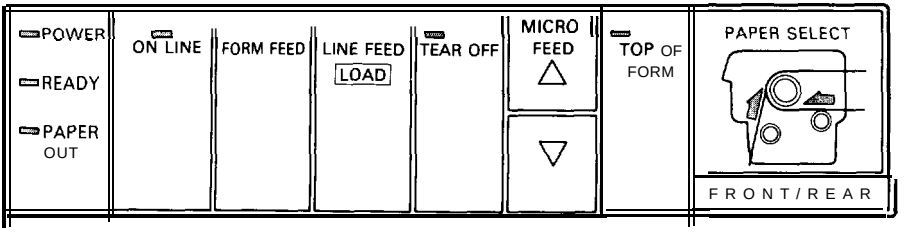
# Using the Printer

## Operating the Control Panel

The DFX-5000's control panel gives you access to several powerful features. The control panel buttons let you control paper loading, printing and tear-off positions, and more. The control panel lights give you status information such as which mode you are in, which tractor is loaded with paper, and which tractor is ready to print. The following sections describe the functions of the control panel's lights and buttons.

### Control panel indicator lights

The indicator lights on the control panel let you check the current status of the printer. Below is an illustration of the control panel lights and a description of their functions.



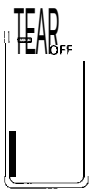


The POWER light comes on when the power switch is on and power is supplied to the printer.


The READY light comes on when the printer is on line and ready to receive data from your computer. This light flickers during printing.

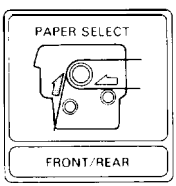

The PAPER OUT light comes on when the printer is out of paper. This light goes on whenever there is no paper positioned behind the print head, even if there is paper loaded on the tractors in the standby position.


The ON LINE light comes on when the printer is on line and ready to receive and print data from your computer.

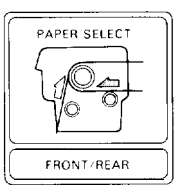



The TEAR OFF light comes on when the printer is in the tear-off mode. The printer remembers any change you make to the tear-off position when this light is on.


The TOP OF FORM light comes on when the printer is in the top of form mode. The printer remembers any change you make to the top of form position when this light is on.



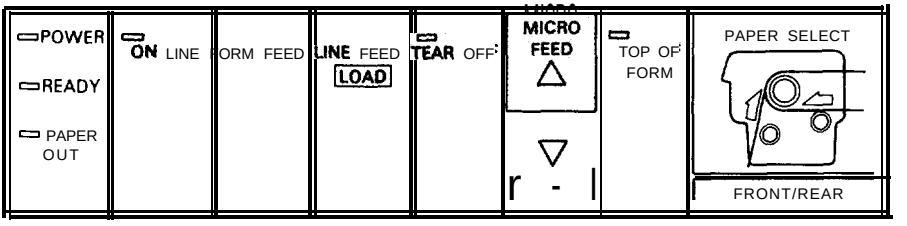

The front tractor arrow comes on when the front tractor is selected. The light is green when paper is loaded, even if the paper is in the standby position, and red when the tractor is completely out of paper.




The rear tractor arrow comes on when the rear tractor is selected. The light is green when paper is loaded, even if the paper is in the standby position, and red when the tractor is out of paper.

## Control panel buttons

The control panel buttons let you perform printer operations quickly and easily. Most buttons work only when the printer is off line. The exceptions to this are the ON LINE button and the LINE FEED/LOAD button.





The ON LINE button controls the printer's on line status. Press this button to put the printer on line or take it off line. When the printer is on line, the ON LINE light is on and the printer can receive and print data from the computer.

When you are in the top of form mode, you can press the ON LINE button to exit the mode without setting a new top of form position. You can also press the ON LINE button to exit the tear-off mode. See Chapter 2 for more information on adjusting the top of form position and using automatic tear-off.


The FORM FEED button lets you advance the paper to the top of the next page. To use this feature, press the button when the printer is off line. To adjust the position that the paper is fed to, see the section on adjusting the top of form position in Chapter 2.

This button can also be used to run the printer's self test. See the section on running the self test in Chapter 1.

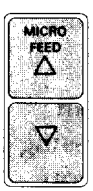

The LINE FEED/LOAD button lets you advance or load paper when the printer is off line. To feed your paper one line, press this button once. Hold the button down to feed paper continuously.

To load paper, there must be paper loaded in the standby position in the selected tractor. See the sections on loading paper in Chapter 2 for more information.


The TEAR OFF button feeds the paper to the printer's tear-off edge so you can tear off your document without losing the paper normally lost between printing jobs. To use this feature, take the printer off line after your document has finished printing and press the TEAR OFF button. The printer feeds the paper to the printer's tear-off edge. After tearing off the document, press the TEAR OFF or ON LINE button to feed the paper back to the top of form position.

If the perforation of your paper does not align exactly with the printer's tear-off edge, you can use the MICRO FEED buttons to adjust the tear-off position. See the section on using automatic tear-off in Chapter 2.

**WARNING:** Never use the TEAR OFF button with labels. Use the FORM FEED or LINE FEED button instead to feed the printed labels to a point where they can be torn off.




The two MICRO FEED buttons advance or reverse the loaded paper in 1/216th-inch increments when the printer is off line. You can use these buttons to adjust the top of form, tear-off, and printing positions.

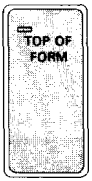
To reset the top of form position, take the printer off line and press the TOP OF FORM button to enter the top of form mode. Then use the MICRO FEED buttons to move

the paper to the desired position. See the section on adjusting the top of form position in Chapter 2.

To reset the tear-off position, take the printer off line and press the TEAR OFF button to enter the tear-off mode and feed the paper to the tear-off position. Then use the MICRO FEED buttons to move the paper to the desired position. See the section on using automatic tear-off in Chapter 2.

To adjust the printing position, take the printer off line and press either MICRO FEED button to advance or reverse the paper to the desired position. See the section on adjusting the printing position in Chapter 2.

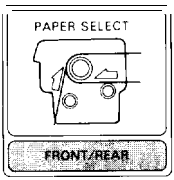
**WARNING:** When using labels, only feed the paper forward with the top MICRO FEED button. Labels must never be fed backward through the printer.




The TOP OF FORM button lets you enter and exit the top of form mode when the printer is off line so you can adjust the top of form position. The top of form position determines where the printing begins on each page.

If your printing is too high or low on the page, you can reset the top of form position by entering the top of form mode and using micro-feed to adjust the position. The printer remembers this new top of form position even after it is turned off, reset, or initialized. Also, the printer remembers separate top of form positions for the front and rear tractors.

If you enter the top of form mode by mistake, you can exit the mode without setting a new position by pressing the ON LINE button. See the section on adjusting the top of form position in Chapter 2.




The FRONT/REAR button lets you select the front or rear tractor when the printer is off line. If you have been using paper loaded on one tractor, first remove the printed output before switching the tractor. When you switch between tractors, the paper already loaded in the printer is fed backward to the standby position, and the paper on the newly selected tractor is loaded.

**WARNING:** Never use the FRONT/REAR button when labels are loaded in the printer. Also, be sure you remove any printed documents before switching tractors. Never feed more than one page backward through the printer.

## Other control panel features

The control panel also gives you access to several special functions.

Self test — By holding down the LINE FEED or FORM FEED button while you turn on the printer, you can start the printer's self test. The self test prints the current DIP switch settings and the characters in the printer's ROM (Read Only Memory). See the section on running the self test in Chapter 1 for more information.

Data dump — By holding down both the FORM FEED and LINE FEED buttons while you turn on the printer, you can turn on the data dump mode. This feature prints the codes that are sent to the printer so that advanced users can find the cause of communication problems between the computer and printer. See the section on the data dump mode in Chapter 7 for more information.

## Using DIP Switches

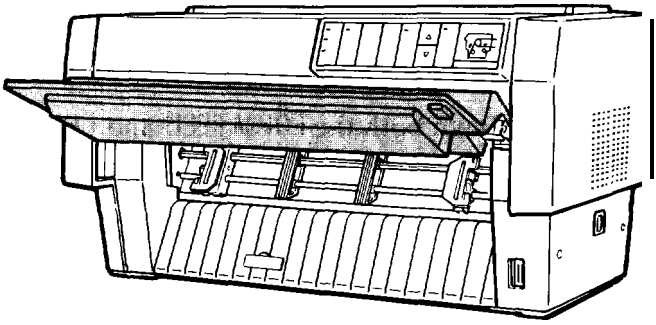
The DFX-5000 has two sets of DIP switches. DIP switches control a variety of printer functions such as page length and printing speed. DIP switch settings are shown in the DIP switch tables starting on page 3-10 and in the Quick Reference card at the back of this manual. Descriptions of all the DIP switch functions are provided in the section on DIP switch functions on page 3-12.

Because the factory (default) settings are designed to accommodate the needs of most users, you shouldn't need to change DIP switch settings very often. If you do need to set a DIP switch, use the following steps-being sure to turn off the printer before you start and turn it on again when you are done.

### Changing DIP switch settings

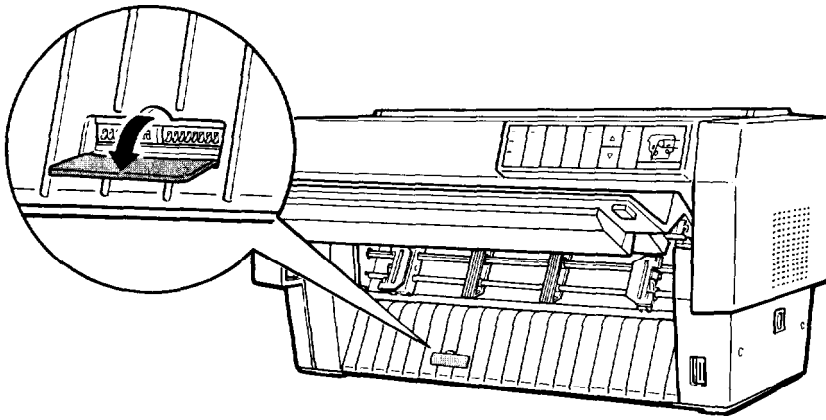
To change a DIP switch setting, follow these steps:

1. Turn off the printer.
2. Open the printer's front cover.

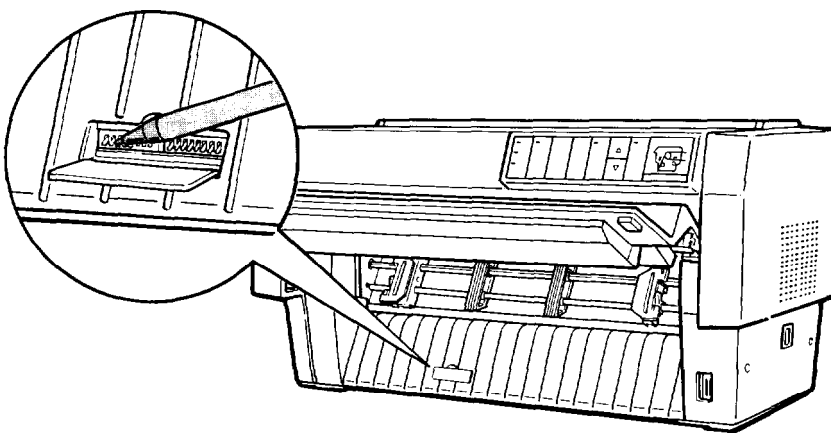


3. The DIP switches are located in a small compartment on the front paper guide, behind the front tractor paper. If there is paper loaded on the front tractor, either remove it or lift it up out of the way so you can reach the DIP switches.

4. Open the DIP switch cover.



5. Use a pointed instrument, such as the tip of a pen or pencil, to turn the switch either on or off. A DIP switch is on when it is up, and off when it is down.



Note: Always make sure that the printer is turned off before changing the DIP switch settings.

6. Close the DIP switch cover and replace the paper.

7. Turn on the printer to initialize the new settings. When you change a DIP switch setting, the new settings take effect only after you turn on or reset the printer.

## DIP switch tables

The following tables show the settings for each DIP switch. The shaded boxes show the default or factory settings. See the page numbers listed on the right for more information about each feature.

*DIP Switch 1*

| Switch | Description | ON | OFF | Page |
|---|---|---|---|---|
| 1-1 | Condensed mode on/off | Condensed | Normal | 3-12 |
| 1-2 | Slashed zero on/off | Slashed | Not slashed | 3-13 |
| 1-3 | Character table | Graphics | Italics | 3-13 |
| 1-4 | Input buffer | OFF | ON | 3-15 |
| 1-5 | NLQ or draft mode | NLQ | Draft | 3-15 |
| 1-6 | International character set | See table below | | 3-16 |
| 1-7 | | | | |
| 1-8 | | | | |

*DIP Switch 2*

| Switch | Description | ON | OFF | Page |
|---|---|---|---|---|
| 2-1 | Page length | 12 inches | 11 inches | 3-17 |
| 2-2 | Draft printing speed | Normal | High | 3-17 |
| 2-3 | Skip over perforation | ON | OFF | 3-18 |
| 2-4 | Auto line feed | ON | OFF | 3-18 |
| 2-5 | Interface type/parity | See table below | | 3-19 |
| 2-6 | | | | |
| 2-7 | Baud rate | See table below | | 3-19 |
| 2-8 | | | | |

*International character set*

| Country | Switch 1-6 | Switch 1-7 | Switch 1-8 |
|---|---|---|---|
| USA | ON | ON | ON |
| France | ON | ON | OFF |
| Germany | ON | OFF | ON |
| United Kingdom | ON | OFF | OFF |
| Denmark | OFF | ON | ON |
| Sweden | OFF | ON | OFF |
| Italy | OFF | OFF | ON |
| Spain | OFF | OFF | OFF |

*Interface/Parity selection*

| Interface type | Parity | Switch 2-5 | Switch 2-6 |
|---|---|---|---|
| Parallel | | O F F | O F F |
| Serial | Odd | | ON |
| Serial | Even | ON | OFF |
| Serial | None | ON | ON |

*Baud rate selection*

| Baud Rate | Switch 2-7 | Switch 2-8 |
|---|---|---|
| 9600 bps | OFF | OFF |
| 4800 bps | OFF | ON |
| 1200 bps | ON | OFF |
| 300 bps | ON | ON |

## DIP switch functions

The different features you can control with the printer's DIP switches are described below.

### Condensed mode

When DIP switch 1-1 is on, your documents are printed in condensed mode. Condensed mode reduces the size of your text characters to approximately 60% their normal width. This means you can get more characters on a line, which is useful for spreadsheets and other applications where you need to print the maximum amount of information on a page.

The printout below compares normal 10 cpi (characters per inch) printing with 10 cpi condensed printing.

> This is 10 cpi printing.
> This is condensed 10 cpi printing.

**Note:** The default pitch on the DFX-5000 is 10 cpi; however, two other pitches, 12 cpi and proportional spacing, can be selected with software. Both 10 and 12 cpi can be condensed, but proportional printing cannot. See Chapter 4 for more information on enhancing your printing with software commands.

### Slashed zero

When DIP switch 1-2 is on, the printer prints slashed zeros (Ø). When the DIP switch is off, the printer prints open zeros (0). This feature is useful for clearly distinguishing between uppercase O and zero when printing documents such as program lists.

### Character table

When DIP switch 1-3 is on, the Epson Extended Graphics character table is selected. When it is off, the italics character table is selected. The Epson Extended Graphics character table contains international accented characters, Greek characters, and graphics characters for printing lines, corners, and shaded areas.

Since these character tables affect only half of the character set, you can still print text if you select the Epson Extended Graphics table. Also, with the proper software commands you can print italics or graphics characters no matter which character table you select.

Although most software programs work better with the graphics table, some programs require the italics table. Try switching tables if you are having trouble printing lines and other graphic characters, or if italics don't print on your printer. Keep in mind, however, that your software may not have the capability to select graphics or italics. See Chapter 4 for information on enhancing your printing using software commands. Also see Appendix A for the complete character tables.

**Note:** You may need to send the ESC 6 printer command to print some of the Extended Graphics characters. See the Command Summary in Chapter 8.

The Epson Extended Graphics character table and the italics character table are shown below.

Epson *Extended Graphics character table*

| CODE | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | 0 | @ | P | ` | p | Ç | É | á | ▒ | └ | ╙ | α | ≡ |
| 1 | | | ! | 1 | A | Q | a | q | ü | æ | í | ▓ | ┴ | ╤ | ß | ± |
| 2 | | | " | 2 | B | R | b | r | é | Æ | ó | ▓ | ┬ | ╥ | Γ | ≥ |
| 3 | | | # | 3 | C | S | c | s | â | ô | ú | ▌ | ├ | ╙ | π | ≤ |
| 4 | | | $ | 4 | D | T | d | t | ä | ö | ñ | ┤ | ─ | ╘ | Σ | ⌠ |
| 5 | | | % | 5 | E | U | e | u | à | ò | Ñ | ┤ | ┼ | ╒ | σ | J |
| 6 | | | & | 6 | F | V | f | v | ª | û | ª | ╢ | ╞ | ╓ | µ | ÷ |
| 7 | | | ' | 7 | G | W | g | w | ç | ù | º | ╖ | ╟ | ╫ | τ | ≈ |
| 8 | | | ( | 8 | H | X | h | x | ê | ÿ | ¿ | ╕ | ╚ | ╪ | Φ | ° |
| 9 | | | ) | 9 | I | Y | i | y | ë | Ö | ⌐ | ╣ | ╔ | ┘ | Θ | • |
| A | | | * | : | J | Z | j | z | è | Ü | ¬ | ║ | ╩ | ┌ | Ω | · |
| B | | | + | ; | K | [ | k | { | ï | ¢ | ½ | ╗ | ╦ | █ | δ | √ |
| C | | | , | < | L | \ | l | ¦ | î | £ | ¼ | ╝ | ╠ | ▄ | ∞ | n |
| D | | | - | = | M | ] | m | } | ì | ¥ | ¡ | ╜ | ═ | ▌ | ø | ² |
| E | | | . | > | N | ^ | n | ~ | Ä | ₧ | « | ╛ | ╬ | ▐ | ∈ | ■ |
| F | | | / | ? | O | _ | o | | Å | ƒ | » | ┐ | ╧ | ▀ | ∩ | |

***Italics character table***

| CODE | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | 0 | @ | P | ` | p | à | § | | 0 | @ | P | ` | p |
| 1 | | | ! | 1 | A | Q | a | q | è | ß | ! | 1 | A | Q | a | q |
| 2 | | | " | 2 | B | R | b | r | ù | Æ | " | 2 | B | R | b | r |
| 3 | | | # | 3 | C | S | c | s | ò | æ | # | 3 | C | S | c | s |
| 4 | | | $ | 4 | D | T | d | t | ì | Ø | $ | 4 | D | T | d | t |
| 5 | | | % | 5 | E | U | e | u | ° | ø | % | 5 | E | U | e | u |
| 6 | | | & | 6 | F | V | f | v | £ | ¨ | & | 6 | F | V | f | v |
| 7 | | | ' | 7 | G | W | g | w | ; | Ä | ' | 7 | G | W | g | w |
| 8 | | | ( | 8 | H | X | h | x | ¿ | Ö | ( | 8 | H | X | h | x |
| 9 | | | ) | 9 | I | Y | i | y | Ñ | Ü | ) | 9 | I | Y | i | y |
| A | | | * | : | J | Z | j | z | ñ | ä | * | : | J | Z | j | z |
| B | | | + | ; | K | [ | k | { | ¤ | ö | + | ; | K | [ | k | { |
| C | | | , | < | L | \ | l | ¦ | Å | ü | , | < | L | \ | l | ¦ |
| D | | | - | = | M | ] | m | } | Á | É | - | = | M | ] | m | } |
| E | | | . | > | N | ^ | n | ~ | á | é | . | > | N | ^ | n | ~ |
| F | | | / | ? | O | _ | o | | Ç | ¥ | / | ? | O | _ | o | Ø |

**Input buffer**

The printer's input buffer provides additional memory to free up the computer while you print large amounts of text or graphics. The input buffer is enabled when DIP switch 1-4 is off. To disable the buffer, turn DIP switch 1-4 on.

**Near letter quality or draft mode**

When DIP switch 1-5 is on, the DFX-5000 prints in near letter quality (NLQ) mode. When the DIP switch is off, it prints in draft mode.

NLQ mode produces high quality text characters at a slower printing speed. The DFX-5000 offers two fonts in NLQ mode, Roman and Sans Serif. Roman is the default font in NLQ mode,

but you can select NLQ Sans Serif with the software command ESC k. See the Command Summary in Chapter 8.

Draft mode produces lower-resolution characters at a fast printing speed. The DFX-5000 has two printing speeds for draft mode, draft and high-speed draft. These printing speeds are controlled by DIP switch 2-2 (see the next page). When you select draft mode, the printer checks DIP switch 2-2 to see which printing speed to use.

```
Draft printing is fast.
High speed draft is even faster.
NLQ Roman is clear and typewriter-like.
```

**International character sets**

International character sets contain the characters and symbols used in other languages. To select the desired international character set, set switches 1-6,1-7, and 1-8 according to the DIP switch table on page 3-11. The character set you select then becomes the default character set. The following table shows the characters that differ in each international character set.

*Infernational character sets*

| Country | ASCII code (hex) | | | | | | | | | | | | DIP SW | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 23 | 24 | 40 | 5B | 5C | 5D | 5E | 60 | 7B | 7C | 7D | 7E | 1-6 | 1-7 | 1-8 |
| 0 U.S.A. | # | $ | @ | [ | \ | ] | ^ | ` | { | ¦ | } | ~ | ON | ON | ON |
| 1 France | # | $ | à | ° | ç | § | ^ | ` | é | ù | è | ¨ | ON | ON | OFF |
| 2 Germany | # | $ | § | Ä | Ö | Ü | ^ | ` | ä | ö | ü | ß | ON | OFF | ON |
| 3 U.K. | £ | $ | @ | [ | \ | ] | ^ | ` | { | ¦ | } | ~ | ON | OFF | OFF |
| 4 Denmark 1 | # | $ | @ | Æ | Ø | Å | ^ | ` | æ | ø | å | ~ | OFF | ON | ON |
| 5 Sweden | # | ¤ | É | Ä | Ö | Å | Ü | é | ä | ö | å | ü | OFF | ON | OFF |
| 6 Italy | # | $ | @ | ° | \ | é | ^ | ù | à | ò | è | ì | OFF | OFF | ON |
| 7 Spain 1 | ₧ | $ | @ | ¡ | Ñ | ¿ | ^ | ` | ¨ | ñ | } | ~ | OFF | OFF | OFF |

In addition to the eight character sets you can select with DIP switches, you can select the five character sets shown below using the ESC R software command. See the Command Summary in Chapter 8 for more information.

| Country | ASCII code (hex) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 23 | 24 | 40 | 5B | 5C | 5D | 5E | 60 | 7B | 7C | 7D | 7E |
| 8 Japan | # | $ | @ | [ | ¥ | ] | ^ | ` | { | ¦ | } | ~ |
| 9 Norway | # | ¤ | É | Æ | Ø | Å | Ü | é | æ | ø | å | ü |
| 10 Denmark II | # | $ | É | Æ | Ø | Å | Ü | é | æ | ø | å | ü |
| 11 Spain II | # | $ | á | ¡ | Ñ | ¿ | é | ` | í | ñ | ó | ú |
| 12 Latin America | # | $ | á | ¡ | Ñ | ¿ | é | ü | í | ñ | ó | ú |

**Page length**

When DIP switch 2-1 is on, the page length is set to 12 inches. When the DIP switch is off, the page length is 11 inches. Page lengths other than 11 or 12 inches can be set with the ESC C and ESC CO commands. See the Command Summary in Chapter 8.

**Printing speed in draft mode**

When DIP switch 2-2 is off, high-speed draft is selected. When the DIP switch is on, normal draft is selected. This setting only affects the printer if DIP switch 1-5 is set for draft mode (see page 3-15) or if draft is selected through your software. If NLQ is selected, the printer ignores the printing speed selected for draft mode, since a slower printing speed is required to print the higher-resolution characters.

High-speed draft prints at 533 characters per second but produces characters that are not as fully formed as the ones produced with normal draft. If you select a feature such as emphasized, double-strike, or italics in high-speed draft mode, the printing speed will temporarily switch to normal draft speed until the enhancement is turned off. This allows you to use any print enhancement without cancelling high-speed draft.

The following printout compares the two printing speeds.

*High-speed draft*

We've just seen your excellent ad for **miniature zebras** in a recent back issue of Trader's Times. What is the price schedule for quantities over one gross?

*Normal draft*

We've just seen your excellent ad for miniature zebras in a recent back issue of Trader's Times. What is the price schedule for quantities over one gross?

**Skip over perforation**

When DIP switch 2-3 is on, the printer inserts a one-inch margin between the last line printed on one page and the first line printed on the next page. By adjusting your top of form position, you can get half the margin at the bottom of one page and half at the top of the next page. See the section on adjusting the top of form position in Chapter 2. Since most application programs do insert their own top and bottom margins, you should use this feature only if your program does not provide them.

**Auto line feed**

When DIP switch 2-4 is on, the printer adds a line feed (LF) command to every carriage return (CR) code sent by the application program software. When the switch is off, line feeds occur only when the software sends line feed commands to the printer. Since most computers and application programs automatically add line feeds to carriage returns, you should use this feature only if your text is printing all on one line.

Note: If you select auto line feed but your text *stiIl* prints on one line, you need to disable the AUTO FEED XT signal. See your Epson dealer for assistance.

**Interface type and parity**

If your computer is set up for serial communication, you need to change DIP switches 2-5 and 2-6 so that your printer and computer can communicate properly. These two DIP switches control the interface type and parity. (You may also need to select a different baud rate. See the following section on baud rate.)

The table below shows the DIP switch settings for a parallel interface, and for a serial interface with odd, even, or no parity. If you don't know what type of interface your computer requires, check your computer manual. Also check your computer manual to make sure your computer and printer have the same parity setting.

*DIP switch settings* for *interface and parity*

| Interface type | Parity | Switch 2-5 | Switch 2-6 |
|---|---|---|---|
| Parallel | | OFF | OFF |
| Serial | Odd | OFF | ON |
| Serial | Even | ON | OFF |
| Serial | None | ON | ON |

**Baud rate**

Besides selecting serial interface and parity, if your computer is set up for serial communications you may also need to change the baud rate setting. Baud rate is the rate at which the printer receives data from the computer.

The table below shows the DIP switch settings for the printer's four baud rate settings. Check your computer manual or application program for the correct baud rate setting. Your computer and printer should always be set to the same baud rate.

*DIP switch settings* for *baud* rate

| Baud Rate | Switch 2-7 | Switch 2-8 |
|---|---|---|
| 9600 bps | OFF | OFF |
| 4800 bps | OFF | ON |
| 1200 bps | ON | OFF |
| 300 bps | ON | ON |

## Using Your Printer With Application Programs

Now that you've set up and tested the printer, you can start using it with your application programs.

Most application programs let you specify the type of printer you're using so that the program can take full advantage of the printer's features. Many programs provide an installation or setup procedure that presents a list of printers to choose from.

If your application program has a printer selection menu, simply choose the DFX-5000 from its list of printers. If the DFX-5000 is not on the menu, choose one of the following, listed in order of preference.

FX-850 / 1050
FX-86e / 286e
FX-85 / 185
FX-80 / 100
EX-800 / 1000
FX
LX
Epson printer
9-pin printer
Standard printer
Draft printer

Note: If your application program does not list the DFX-5000, you may want to contact the software manufacturer to see if an update is available.

### A quick test

After setting up your application program, print a sample document to make sure the program and the DFX-5000 are communicating properly. If the document doesn't print correctly, recheck the program's printer selection and installation

procedure. If you're still having trouble printing, see Chapter 7 for troubleshooting information.

## Using word processors

Word processors usually let you use a fixed set of printer features by placing markers around the text to be altered. When the document is printed, the markers are recognized and translated into suitable commands for your printer. Some programs show the markers on the screen, while others display the text as it will look when it prints (for example, in bold or italics).

Some word processing programs also let you insert printer commands in your document. These commands may or may not be visible on the screen. This method has the advantage of allowing you to use any DFX-5000 printer feature, not just the features available with your word processing program.

To use printer commands, first check your word processor manual to see if the software allows you to insert printer commands in your document. Then see the section on sending commands to the printer in Chapter 4. Also see the Command Summary in Chapter 8 for a list of the commands available on the DFX-5000.

## Using spreadsheets

Although spreadsheets seldom use as many printing styles as word processors, they do have some very specific requirements.

If your spreadsheet program provides a list of printers, use the list on the last page to find the proper selection. If your spreadsheet doesn't have a printer setup routine, read the program's manual carefully for information on printing.

A major concern when printing spreadsheets is the number of columns, or characters, that can fit on a line. In its normal printing pitch of 10 characters per inch (cpi), the DFX-5000 can print up to 136 characters in a line. You can increase the number of characters

by about 65% if you select condensed printing with a DIP switch. You can also select 12 cpi, condensed mode, or both with a software command.

The table below shows you the number of characters that **can** fit on a line using these available options. If your spreadsheet asks the number of columns your printer can print, decide which option you want to use and supply the appropriate number from this table.

| Typestyle | Number of columns |
|---|---|
| Normal | 136 |
| 12 cpi | 163 |
| Condensed | 233 |
| 12 cpi condensed | 272 |

Unlike word processors, spreadsheet programs usually don't let you change printer commands within a spreadsheet. Instead, you select one style or mode of printing for the entire spreadsheet.

To choose the condensed mode for the entire spreadsheet, it may be easiest to simply set DIP switch l-l for condensed mode. See the section earlier in this chapter on using DIP switches.

To use the DFX-5000's printer commands, first look in the manual for your spreadsheet program to find out how to send printer commands. Then see the section on sending commands to the printer in Chapter 4. Also see the Command Summary in Chapter 8 for a list of the commands available on the DFX-5000.

Chapter 4

# Getting the Most from Your Printer

## Enhancing Your Printing

Your printer's DIP switches control the printing style of a whole document. Software commands, on the other hand, let you change anything from a single character to the entire document. By using software commands, you can obtain many different printing effects with the DFX-5000 printer, from arranging the text on the page to giving extra emphasis to particular words and phrases.

You can obtain many of the effects described in this section with your application program, but not all. For example, many word processing programs let you choose bold or underlined text, but do not have an option for printing double-wide text. And while some programs let you print an entire document in a typestyle such as italics or NLQ, many don't let you select a particular typestyle for just one word or phrase. If your software program lets you insert printer commands in your document, you can be much more versatile in your printing.

Once you have read about some of the special features the DFX-5000 offers, you may want to check your software manual to see how you can use a particular feature. If your software lets you send printer commands, you can look up the command for the feature in the Command Summary in Chapter 8. To understand more about how your software communicates with your printer and how to send commands, see the section in this chapter on sending commands to the printer.

### Print quality and fonts

The DFX-5000 has three levels of print quality: high-speed draft, normal draft, and NLQ (near letter quality). High-speed draft is ideal for rough drafts and large documents or reports that you need to print quickly. Normal draft is a bit slower, but offers higher resolution characters. Finally, NLQ takes a little longer, but produces darker, more fully formed characters suitable for presentation-quality documents.

For NLQ printing, the **DFX-5000** offers two fonts, Roman and Sans Serif. NLQ Roman is automatically selected when you select the NLQ mode with a DIP switch or with the software command ESC x 1. To select NLQ Sans Serif, you must use the software command ESC k.

The following printout compares high-speed draft, draft, NLQ Roman, and NLQ Sans Serif. See pages 3-15 and 3-17 for more information on selecting NLQ and the two draft modes with DIP switches.

**High-speed draft**

We've just seen your excellent ad for **miniature zebras** in a recent back issue of Trader's Times. What is the price schedule for quantities over one gross?

**Normal draft**

We've just seen your excellent ad for miniature zebras in a recent back issue of Trader's Timer;. What is the price schedule for quantities over one gross?

**NLQ Roman**

We've just seen your excellent ad for miniature zebras in a recent back issue of Trader's Times. What is the price schedule for quantities over one gross?

**NLQ Sans Serif**

We've just seen your excellent ad for **miniature zebras** in a recent back issue of Trader's Times. What is the price schedule for quantities over one gross?

**Note:** High-speed draft is available only with 10 cpi printing (the printer's default pitch). Also, the only print enhancement that can be combined with high-speed draft is underlining. If other enhancements or character sizes are selected, the printer switches to normal draft speed. High-speed draft resumes again after the feature is turned off.

### Character pitch

Your printer's default character pitch is 10 characters per inch (cpi). However, you can select 12 cpi or proportional spacing through your software or by sending printer commands.

In 10 and 12 cpi, each character gets an equal amount of space. In proportional mode, however, spacing varies from character to character. A narrow letter like the lowercase i receives less space than the uppercase W. The width assigned to each character in proportional spacing is shown in the proportional width table in Appendix A.

The following printout compares the different types of spacing.

**10 cpi**

This is 10 CPI printing.
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz

**12 cpi**

This is 12 CPI printing.
ARCDEPGHIJKLWOpBRSTUVWYZ
abcdefghijklmnopqrstuvwxyz

**Proportional spacing**

This is proportional printing.
ABCDEFGHIJKLMNOPQRSTUVWKYZ
abcdefghijklmnopqrstuvwxyz

Note: High-speed draft is available only in 10 cpi. If you select 12 cpi or proportional, the print speed temporarily switches to normal draft speed until 12 cpi or proportional is turned off.

### Character size

Condensed and double-wide printing are two ways to change the width of printed characters. Condensed printing reduces the width of your characters by approximately 60%. This means you can get more characters (about 65% more) on a line, which is useful for printing spreadsheets. Double-wide printing, on the other hand, doubles the width of each character. This effect is useful for printing headings and other text that you want to stand out.

Although condensed printing can be selected for entire documents with a DIP switch (see page 3-12), you can use condensed printing for only a portion of your document by using software commands. Double-wide printing can only be selected through your software or by using software commands.

Widening or narrowing the characters also widens or narrows the spaces between words and letters. Because word processors usually create a left margin by printing spaces, you may need to change the number of characters on a line to keep the margins correct if you change widths. For example, a left margin of 10 characters at 10 cpi is the same as a five-space margin using double-wide characters.

Here is an example of condensed and double-wide printing:

**This is 10 cpi printing.**
Condensed 10 cpi gives you more characters on a line.
Condensed 12 pitch gives you even more.
T h i s i s d o u b l e - w i d e

**Note:** High-speed draft will temporarily switch to normal draft speed if condensed or double-wide printing is selected.

## Emphasized and double-strike printing

Emphasized and double-strike printing give your documents added emphasis. If your word processing program lets you print bold, it probably uses the DFX-5000's emphasized or double-strike command.

In emphasized mode, the DFX-5000 prints each character twice as the print head moves across the paper. The second character is printed slightly to the right of the first to produce darker, more fully formed characters. In double-strike mode, the printer prints each character twice, the second time slightly below the first, to make the text bolder. For even greater boldness, you can combine emphasized and double-strike.

Here is an example of emphasized and double-strike printing:

This is normal draft printing.
**This is emphasized** draft **printing.**
**This is double-strike in** draft mode.
This is double-strike and emphasized combined.

**Note:** Double-strike is ignored when combined with NLQ printing. Also, high-speed draft will temporarily switch to normal draft speed if emphasized or double-strike printing is selected.

### Italic printing

You can use italic characters for special emphasis or as an alternative typeface. Some software programs let you select italics for the entire document, but with software commands you can select italics for a single word or phrase.

Here is an example of italic printing:

**This is NLQ printing.**
***This is italicized NLQ printing.***

Note: The printer command ESC 4 turns on the italic mode even if the current DIP switch setting is set to the Epson Extended Graphics character table instead of the italics character table. (See page 3-13 for more information on which character table to use.)

### Underlining

The underline mode automatically underlines any piece of text. It underlines spaces, subscripts, and superscripts. (You can't underline horizontal tabs, however.) Underlining is the only printing enhancement that can be combined with high-speed draft without reducing the printing speed. Although you can usually select underlining using your software program, you can also select it with a software command.

### Superscripts and subscripts

Superscripts and subscripts can be used for printing footnote numbers and mathematical formulas. The following example combines underlining and subscripts in a mathematical formula.

$$\text{average} = \frac{(a_1 + a_2 + \text{-----} + a_n)}{n}$$

## Sending Commands to the Printer

This section describes how you can send commands directly to the printer, allowing you to take full advantage of your printer's capabilities.

### ASCII codes

Your computer communicates with your printer using a standardized set of numbered codes called ASCII codes (American Standard Code for Information Interchange). When you press the letter A on the keyboard, it is translated into the ASCII code for A, transmitted to a peripheral device such as your computer screen or your printer, and then converted back into the letter A.

There are ASCII codes for all the letters in the alphabet, both uppercase and lowercase letters, and for the numbers 0 through 9. The ASCII set of codes also includes most punctuation marks and some codes that control printer functions.

In the Command Summary in Chapter 8, each ASCII code is expressed three different ways: as an ASCII character, as a decimal number, and as a hexadecimal number. Hexadecimal numbering, or base 16, uses the numbers 0 through 9 plus the letters A through F. For example, the uppercase letter K is represented as the ASCII character K, the decimal number 75, and the hexadecimal number 4B. All of these values are equivalent. The numbering system you use depends on your software and your preferences.

All letters, numbers, and punctuation marks are assigned decimal numbers from 32 through 255. ASCII codes with decimal values of less than 32 are called control codes because they control the operation of your printer and other peripherals. These ASCII characters do not usually have corresponding keys on the keyboard and **cannot** be printed as characters by your printer. (However, some software programs do use control key codes for decimal values. See the Control Key chart in Chapter 8.)

## Escape sequences

Although there are more than 30 control codes available to control the operation of your printer, many more codes are required to run today's sophisticated printers. Therefore, ASCII codes are grouped in sequences that represent certain functions. These code sequences make use of the ASCII codes with decimal values of 32 through 255, normally reserved for characters and punctuation, to control printer functions. This is done by first sending a standard code to tell the printer that the codes that follow are to be used as control codes, not as characters or punctuation.

The standard code that is sent at the beginning of these code sequences is the Escape code, decimal value 27. Any sequence of codes starting with the Escape code is called an Escape sequence. You will probably see Escape written in different ways-such as ESC, Esc, and ESCape-in various manuals. In this manual it is in the form of ESC when used within a command.

## Printer commands

In order for the printer to recognize the instructions it receives, ASCII codes must be sent to the printer within a specific format, called a command. An Escape sequence is a command, as is any ASCII code or sequence of codes that instructs the printer to carry out a particular function. Your software continually sends commands to your printer and your computer screen. These commands instruct your printer to perform such functions as print in a particular typeface, feed the paper a certain amount after printing each line, and start printing on a particular spot on the page.

Some software programs let you send these commands yourself. The commands that your printer recognizes are listed in the Command Summary, Chapter 8, and on the Quick Reference card in the back of this manual.

## Using the Command Summary

The commands listed in the Command Summary consist of various combinations of ASCII codes. You can use either the ASCII characters or their decimal or hexadecimal equivalents. For example, the command to turn on subscript is ESC S1 in ASCII characters. The decimal format for this command is 27 83 01, and the hexadecimal format is 1B 53 01.

In the Command Summary, commands are grouped by the printer functions they control, such as character width and print enhancement. You can also look up commands in the list of software commands in numerical order that immediately precedes the Command Summary in your printer manual. This list gives you page number references for all the commands.

Some commands include a variable, such as the letter *n*. For example, the command for selecting or cancelling double-high mode is ESC *w n*. When *n* = 1, double-high printing is turned on, and when *n*= 0, double-high is turned off. In your Command Summary variables are printed in italics to distinguish them from ASCII characters.

## Sending commands from your software program

How you format commands depends on the software program you are using. Some software programs accept only the decimal format, while others have certain punctuation you must use. Some programs don't let you insert codes at all.

If your software does allow you to send commands to the printer, use the Command Summary to find the command you want to send. Your software manual should explain exactly what format and punctuation are required.

## Selecting typestyles with Master Select

Your printer has a special command called Master Select that allows you to choose many possible combinations of nine printing enhancements. To send Master Select codes to the printer, you must first choose the combination of features you want.

Here are the features you can choose:

10 cpi

12 cpi

proportional

condensed

emphasized

double-strike

double-wide

italics

underline

The format of the Master Select command is:

| | | | |
|---|---|---|---|
| ASCII | ESC | ! | *n* |
| Decimal | 27 | 33 | *n* |
| Hexadecimal | 1B | 21 | *n* |

To send the Master Select codes to your printer in a decimal format, you send the codes 27, 33, and then whatever value you choose for the variable n.

The variable *n* is a number that identifies the typestyle or combination of typestyles. To find the value of *n*, look at the Master Select table below and add up either the decimal or hexadecimal numbers for the features you want.

*Master Select table*

| Feature | Dec. | Hex. |
|---|---|---|
| 10 cpi | 0 | 00 |
| 12 cpi | 1 | 01 |
| proportional | 2 | 02 |
| condensed | 4 | 04 |
| emphasized | 8 | 08 |
| double-strike | 16 | 10 |
| double-wide | 32 | 20 |
| italics | 64 | 40 |
| underline | 128 | 80 |

For example, if you want to print a title using double-wide 12 cpi characters in double-strike mode, you add these three decimal numbers together to calculate the value of *n:*

| | |
|---|---|
| 12 cpi | 1 |
| Double-strike | 16 |
| Double-wide | 32 |
| *n* = | 49 |

After calculating the value of *n,* use the Master Select command to send the value to the printer. To send the Master Select command for double-wide, 12 cpi, and double-strike, you would use the decimal codes 27, 33, and 49.

| | | | |
|---|---|---|---|
| ASCII | ESC | ! | 1 |
| Decimal | 27 | 33 | 49 |
| Hexadecimal | 1B | 21 | 31 |

Consider these things when you use the Master Select command:

- Master Select cancels any of the listed features that you do not set. For example, if you have already set 12 cpi, and you try to use Master Select to set emphasized double-strike only, the character width is reset to 10 cpi.
- Proportional overrides 10 cpi, 12 cpi, and condensed.
- Double-strike is ignored when combined with NLQ mode.
- Only underlining can be combined with high-speed draft without slowing the print speed. If other combinations are used, high-speed draft is temporarily overridden and draft mode is selected.

Print quality and font are not part of Master Select and must be set separately using the ESC x and ESC k commands.

Chapter 5

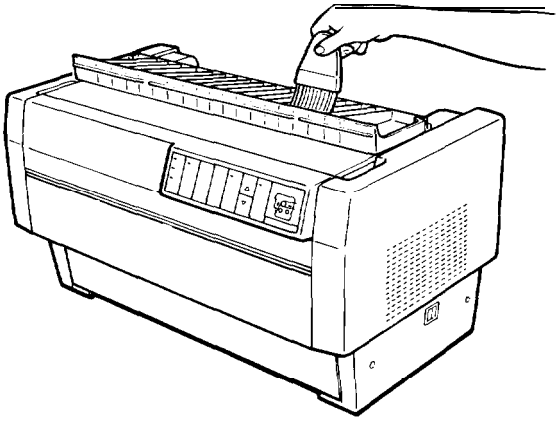
# Maintaining and Transporting the Printer

## Cleaning the Printer

To keep your printer operating at its best, you should clean it thoroughly several times a year.

The following steps show you how to clean the printer. If you have installed the optional pull tractor, remove it before cleaning the printer.

1. Turn off the printer and close all of its covers.
2. Using a soft brush, carefully remove all dust and dirt.



3. If the outer case is dirty or dusty, clean it with a soft, clean cloth dampened with mild detergent dissolved in water. Keep all of the covers closed to prevent water from getting inside the printer.

**WARNING:**

- Never use alcohols or thinners to clean the printer. These chemicals can damage the printer components as well as the case.
- Be careful not to get water on the printer mechanism or electronic components.
- Do not use a hard or abrasive brush.
- Do not spray the inside of the printer with lubricants. Unsuitable oils can damage the mechanism. Contact your Epson dealer if you think lubrication is needed.

## Replacing the Ribbon

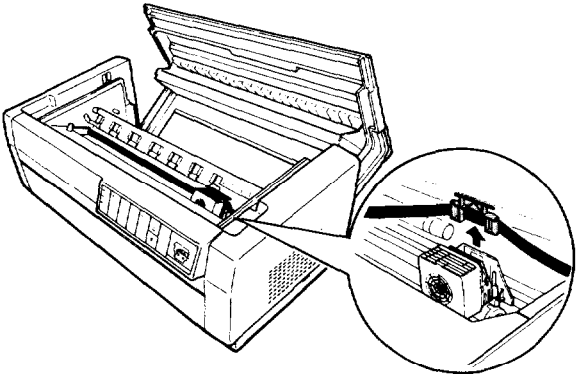
When your printing becomes too faint, you need to replace the ribbon. Use only the #8766 Epson replacement cartridge for the DFX-5000.

The following steps show you how to replace the ribbon.

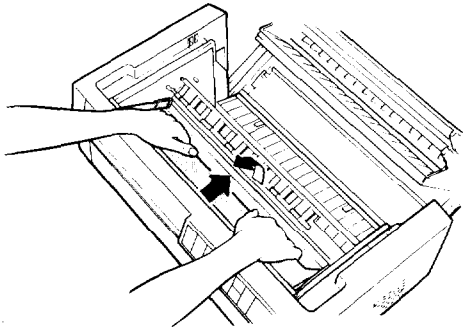
**WARNING:** If the printer has been used recently, the print head may be hot. Let it cool before attempting to replace the ribbon.

1. If the printer is on line, press the ON LINE button to take it off line. This widens the gap between the print head and the platen, making it easier for you to replace the ribbon. Then turn off the printer.
2. Open the printer's top cover and slide the print head to the far right.

3. Lift the ribbon guide off the print head as shown below.



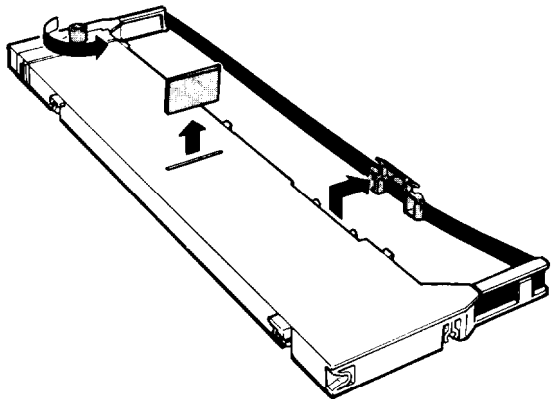
4. Pull up on the side of the ribbon cartridge as shown below to release it from the printer's mounting pins. Then remove the cartridge by lifting it up and away from you.



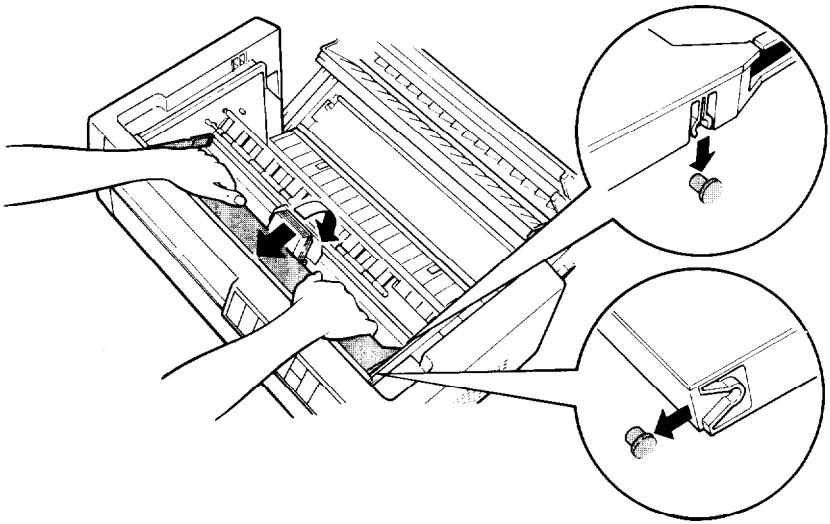
**Caution:** Make sure you don't pull on the flat gold cable beneath the ribbon cartridge.

5. Move the print head back to the middle of the printer.

6. After taking the new ribbon cartridge out of the box, remove the separator piece from the ribbon cartridge as shown below. (This piece can be discarded.) Then detach the ribbon guide from its holder on the ribbon cartridge and turn the ribbon-tightening knob to remove any slack in the ribbon.

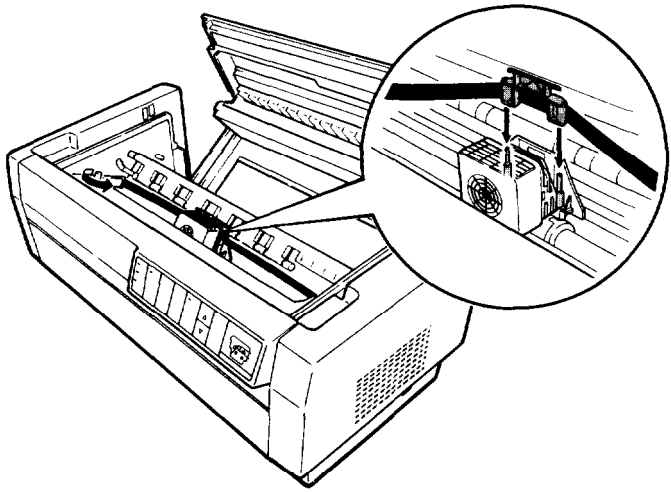


7. Hold the ribbon cartridge with both hands and lower it into the printer as shown below. Pulling the cartridge toward you, slide the hooks nearest you over the corresponding two pins in the printer. Then push the cartridge down into position so that the remaining two hooks snap into place over the mounting pins in the printer.

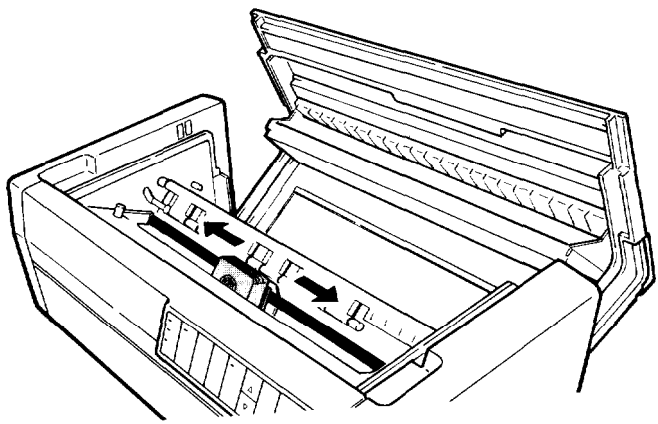


8. Press lightly on both sides of the cartridge to make sure the hooks are properly inserted.

9. Fit the plastic ribbon guide onto the metal pins on each side of the print head, as shown below. The smaller end of the guide should be on top, with its angled edge toward the platen. Turn the ribbon-tightening knob to remove any slack in the ribbon.



10. Slide the print head from side to side to make sure that it moves smoothly and that the ribbon is not twisted or creased.

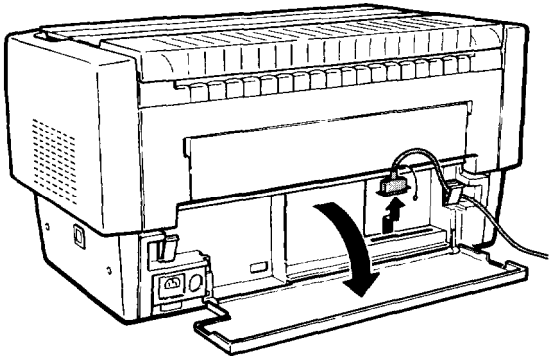


11. Close the printer's top cover.

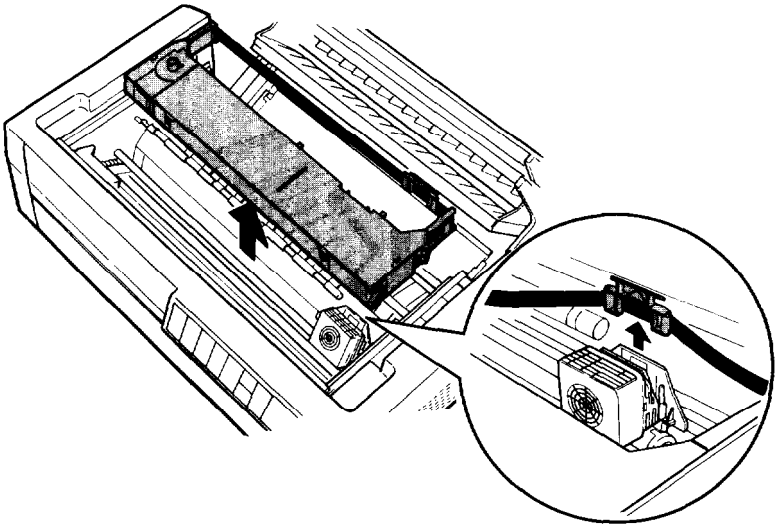
## Transporting the Printer

If you need to transport your printer some distance, carefully repack the printer using the original box and packing materials. The following steps show you how to repack your printer.

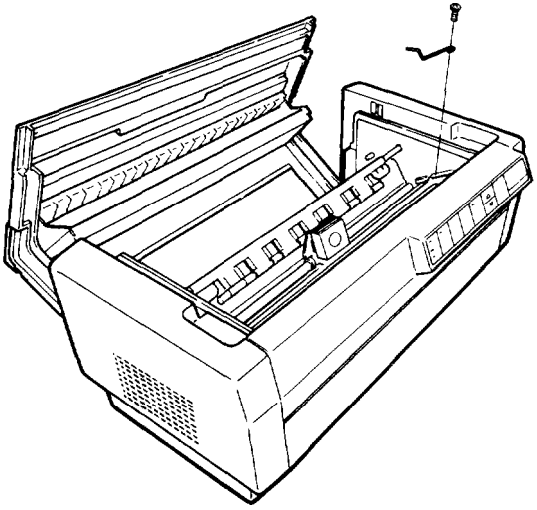
1. Turn off the printer and remove any paper installed in the printer. If you have multi-part forms or labels loaded in the printer, remove them according to the instructions in the sections on using multi-part forms and labels in Chapter 2. Also, if you have any printer options installed, remove them according to the instructions in Chapter 6.
2. Unplug the power cable from the electrical outlet and then disconnect the power cable from the printer.
3. If you are using the built-in parallel or serial interface, open the printer's interface cover and disconnect the interface cable. Then close the interface cover.



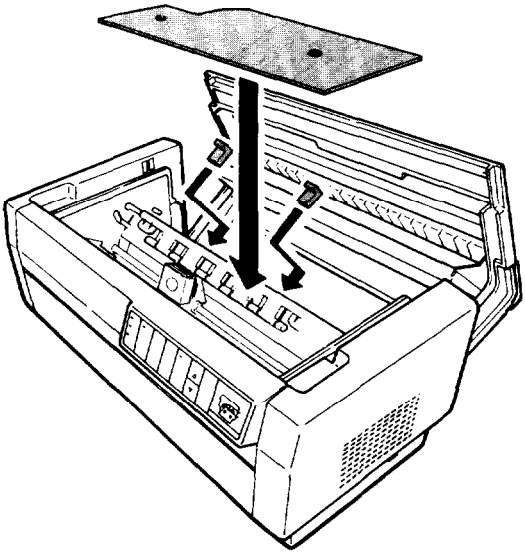
4. Open the printer's top cover and slide the print head to the far right. Detach the ribbon guide from the print head as shown below, and then remove the ribbon cartridge.



5. Using a cross-head screwdriver, reattach the carriage guide support bar.



6. Reattach the two locking brackets and insert the print head protector as shown below. Then insert foam packing material for the paper bail.



7. Close the printer's top cover and put the printer back in its original box.

**WARNING:** Even when you need to carry the printer only a short distance, do not carry it by yourself. The printer should always be carried by two people.

Chapter 6

# Using the Printer Options

## Using the Pull Tractor

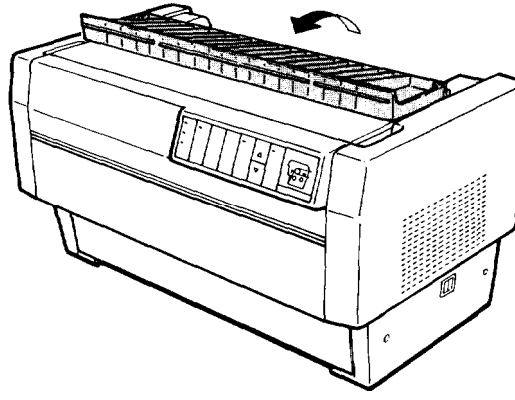
The optional pull tractor (#8309) provides optimum continuous paper handling. The pull tractor is especially useful with continuous multi-part forms and labels. For best results, use the pull tractor with either the printer's front or rear built-in tractor, as described in this section.

### Installing the pull tractor

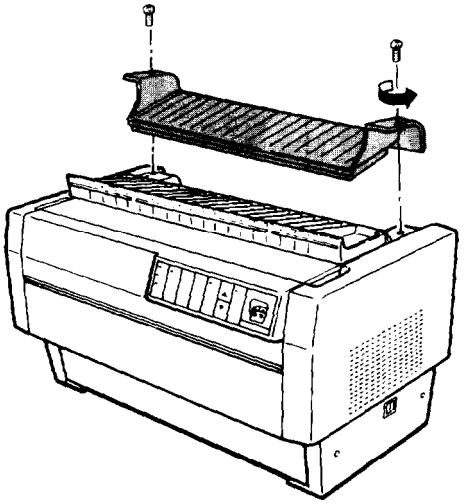
To install the pull tractor, you need a cross-head screwdriver. The following steps show you how to install the pull tractor.

Note: If you are going to be using the pull tractor with the built-in rear tractor, you should load paper onto the rear tractor before installing the pull tractor. See the section on loading paper onto the rear tractor in Chapter 2.

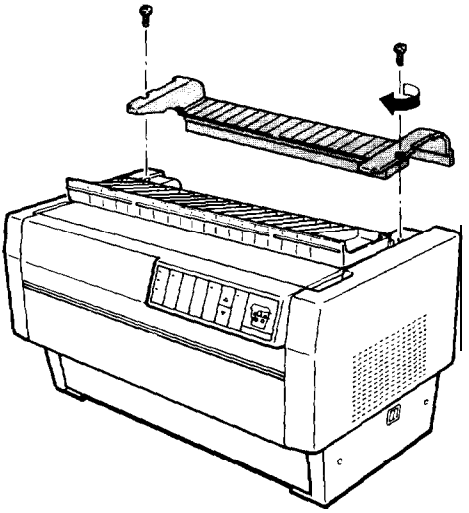
1. Turn off the printer and open the paper separator cover.



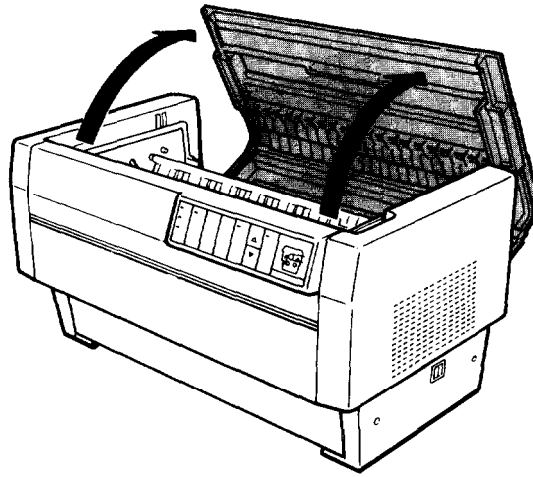
2. Use the cross-head screwdriver to remove the paper separator.



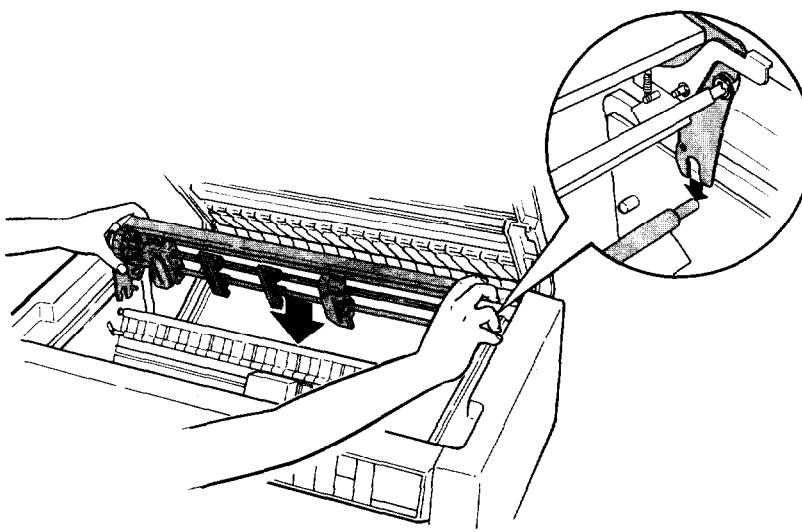
3. Using the two screws you just removed from the printer's original paper separator, install the paper separator that comes with the pull tractor.



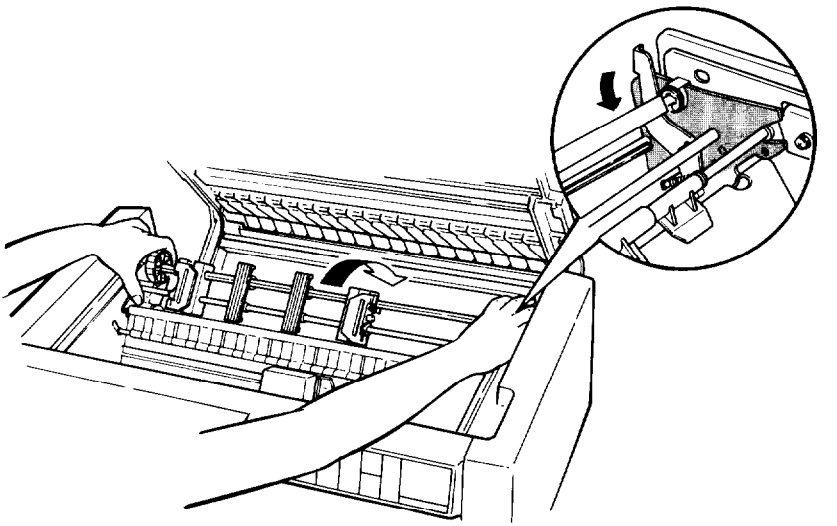
4. Close the paper separator cover and open the printer's top cover.



5. Holding the pull tractor with its gears to the left, fit the tractor's front notches over the mounting shaft of the printer.



6. Tilt the pull tractor back until its rear latches click into place over the printer's rear mounting pins.



7. Close the printer's top cover.

## Using the pull tractor with the front tractor

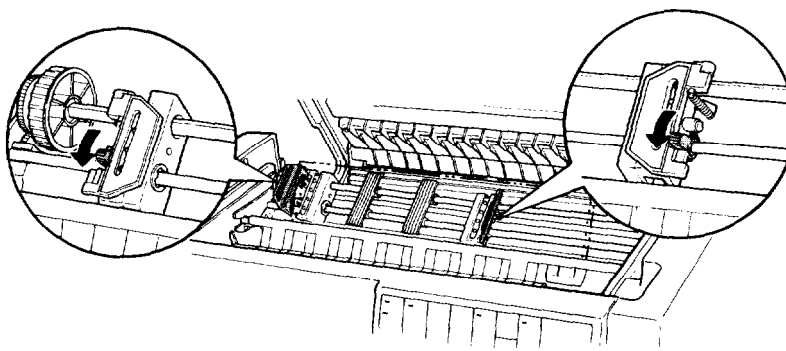
If you are using labels, or multi-part forms with more than four parts including the original, you should use the pull tractor with the printer's built-in front tractor.

You can switch between the front and rear tractors at any time when you are using the pull tractor. Just press the FRONT/REAR button and then use the FORM FEED button to feed the paper the additional distance to the pull tractor. (Labels require special handling. See the section on using labels in Chapter 2.)

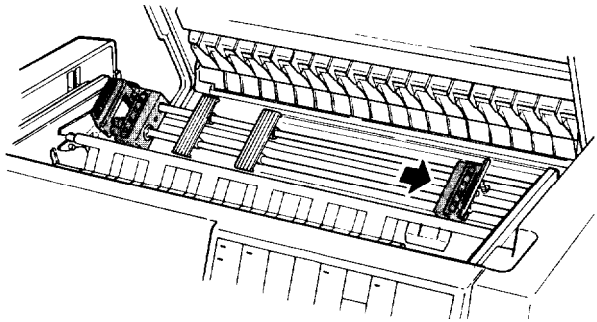
The automatic tear-off feature does not work when the pull tractor is installed. To tear off documents, press the FORM FEED button to advance the paper to a point where it can be torn off.

The following steps show you how to load paper using the optional pull tractor with the printer's built-in front tractor.

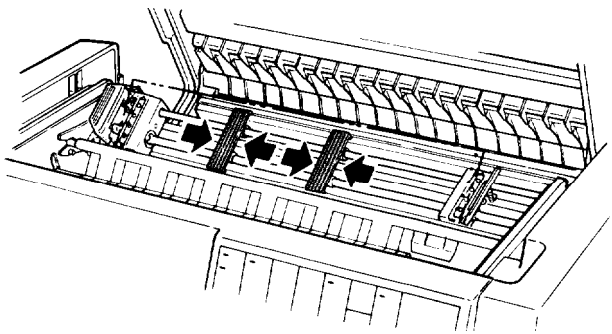
1. Turn on the printer and open the top cover.
2. Make sure there is paper loaded to the top of form position. If there already is paper on the tractor but it is in the standby position, press FRONT/REAR or LINE FEED/LOAD (depending on which tractor is selected) to load the paper to the top of form position. If there is no paper in the tractor at all, load paper as described on page 2-3.
3. Once you have paper loaded on the printer's front tractor, use the FORM FEED button to advance the paper to the pull tractor.
4. Release both sprocket lock levers on the pull tractor by pulling them toward you. Then open both sprocket covers.



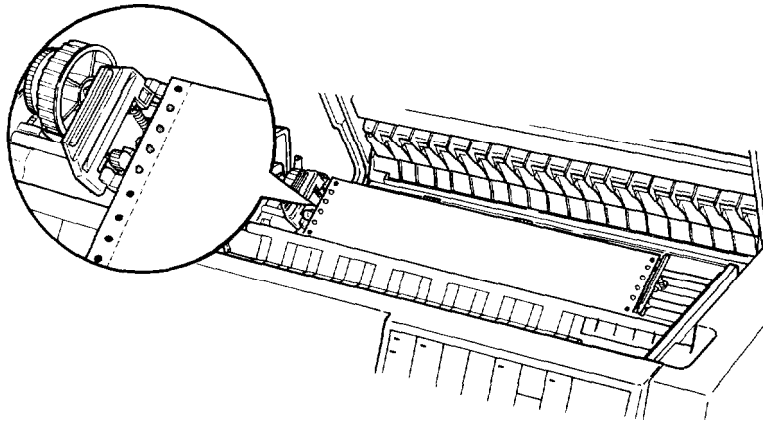
5. Adjust the sprocket units to match the width of your paper.



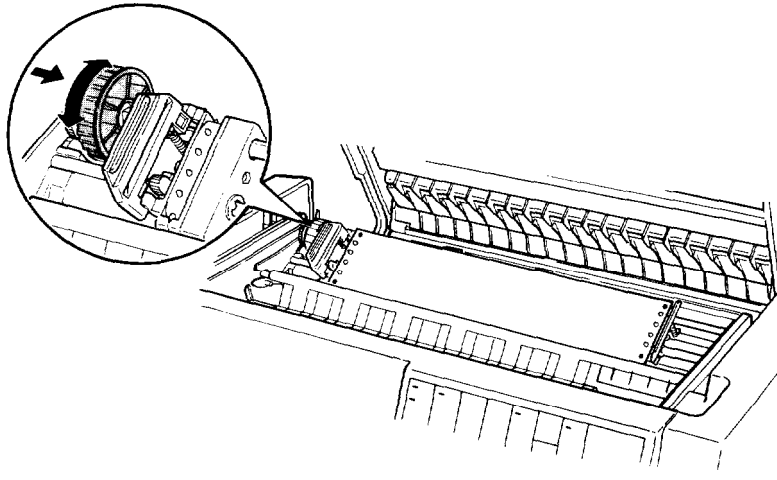
6. Slide the two paper supports so that they are spaced evenly between the two sprocket units.



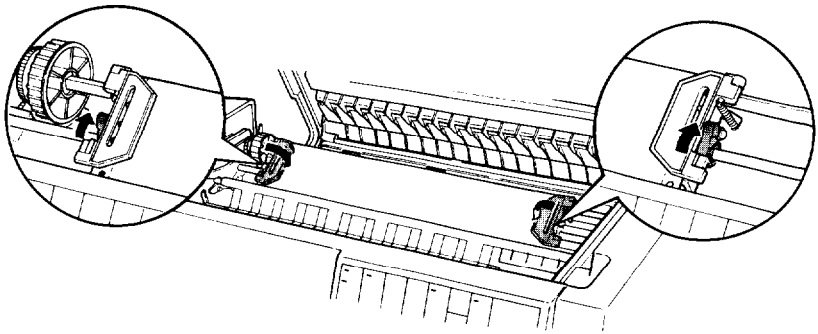
7. Fit the sprocket holes of the paper over the sprocket pins.



8. If there is slack in the paper, or if the holes in the paper do not align properly with the sprocket pins, use the tractor feed knob to adjust the position of the paper as shown below. Slide the knob to the right first, and then turn it as necessary.



9. Close the sprocket covers. Slide the sprocket units so that the paper is straight and smooth, and then lock them into place.



10. Adjust the top of form position as described in in Chapter 2.
11. Press the FORM FEED button to feed the paper out the back of the printer. Make sure the edge of the first sheet emerges below the paper separator.
12. Close the top cover and press the ON LINE button so you are ready to print.

### Using the pull tractor with the rear tractor

If you are using labels or multi-part forms with more than four parts including the original, do not use the rear tractor; use the front tractor instead. See the previous section on using the pull tractor with the front tractor.

You can switch between the front and rear tractors at any time when you are using the pull tractor. Just press the FRONT/REAR button and then use the FORM FEED button to feed the paper the additional distance to the pull tractor. (Labels require special handling. See the section on using labels in Chapter 2.)

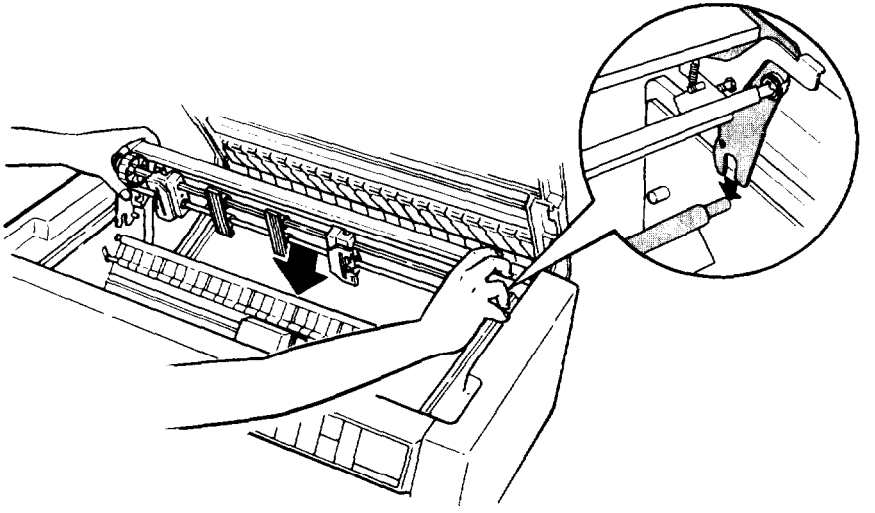
The automatic tear-off feature does not work when the pull tractor is installed. To tear off documents, press the FORM FEED button to advance the paper to a point where it can be torn off.

The following steps show you how to load paper using the optional pull tractor with the printer's built-in rear tractor. If you have not yet installed the pull tractor, load paper onto the rear tractor *before* installing the pull tractor. Then install the pull tractor as described earlier in this chapter.

1. Turn on the printer and open the top cover.

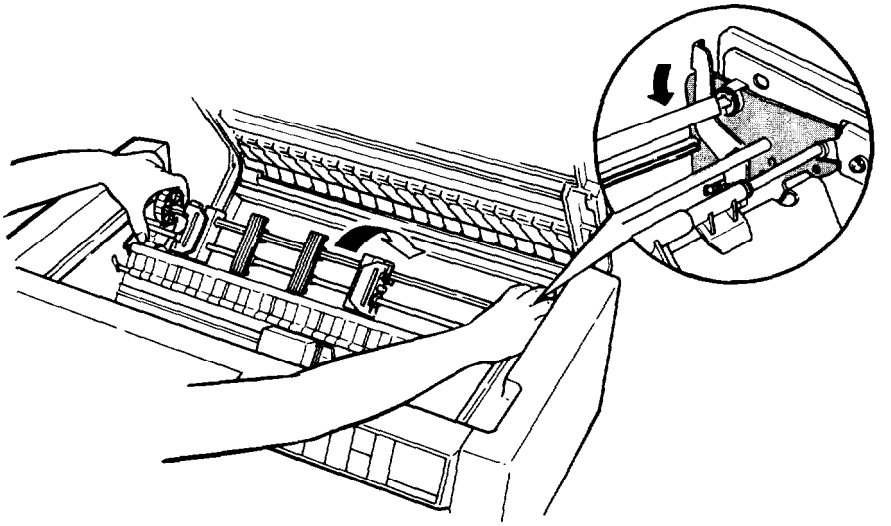
2. If there is no paper loaded on the rear tractor, you need to follow Steps 2a through 2c below to load paper onto the rear tractor. If there is paper on the rear tractor, in either the top of form or standby position, skip to Step 3.

2a. Pull the levers on the pull tractor toward you to release the pull tractor, and then tilt the tractor forward so that its pins rest on the metal frame of the printer.



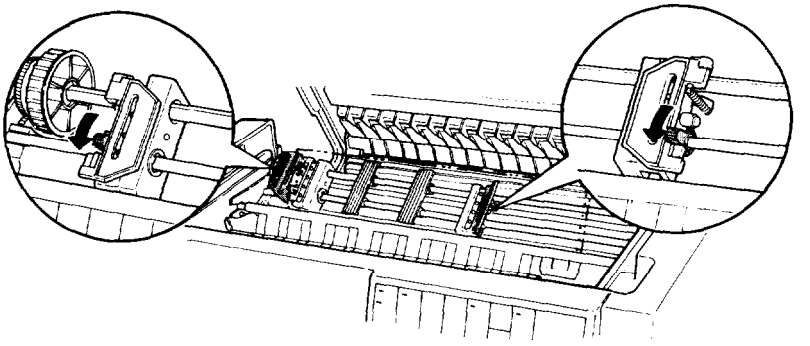
2b. Load paper onto the rear tractor as described on page 2-9.

2c. Tilt the pull tractor back until the rear latches click into place over the printer's rear mounting pins.

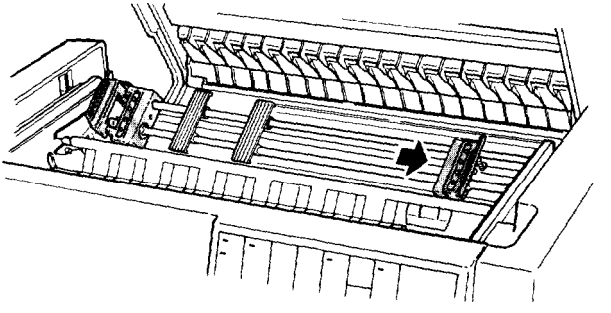


3. Use the **FORM FEED** button to advance the paper to the pull tractor.

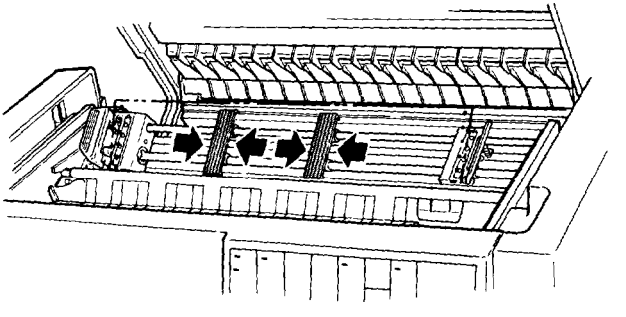
4. Release both sprocket lock levers on the pull tractor by pulling them toward you. Then open both sprocket covers.



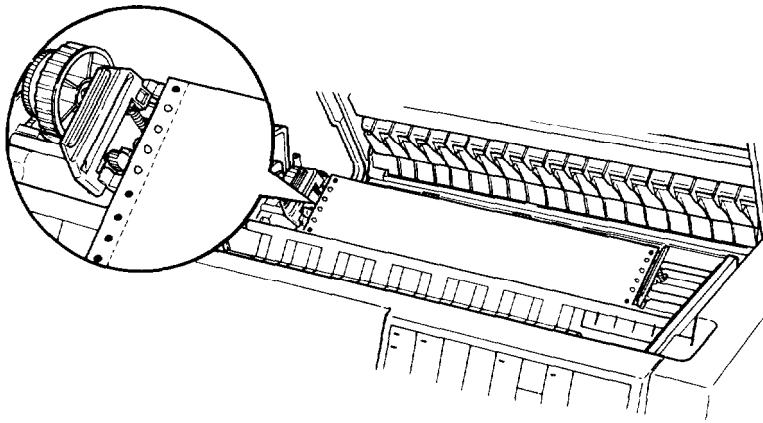
5. Adjust the sprocket units to match the width of your paper.



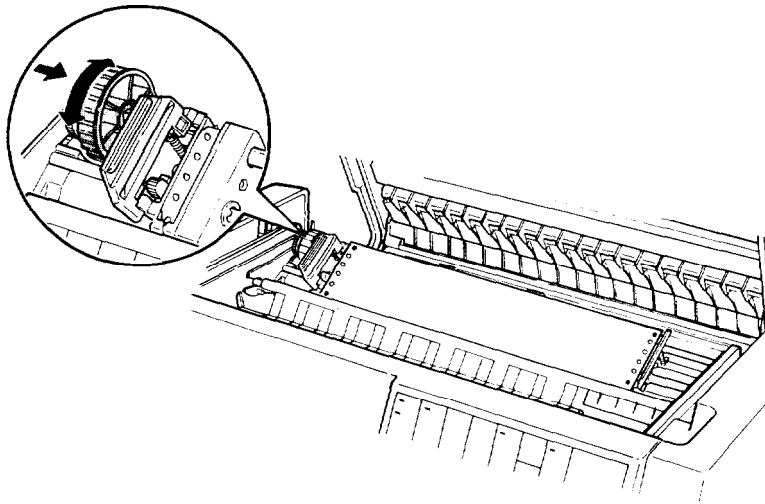
6. Slide the two paper supports so that they are spaced evenly between the two sprocket units.



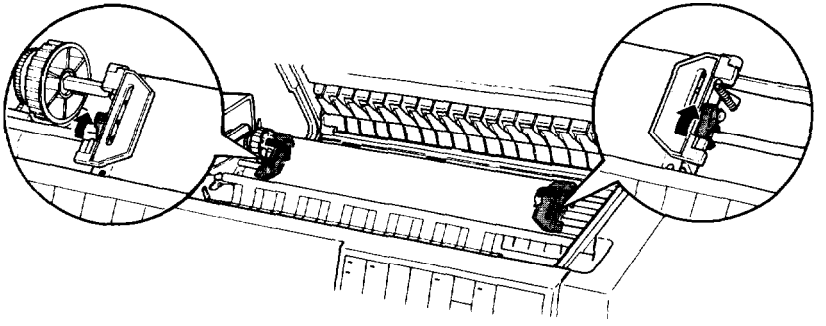
7. Fit the sprocket holes of the paper over the sprocket pins.



8. If there is slack in the paper, or if the holes in the paper do not align properly with the spocket pins, use the tractor feed knob to adjust the position of the paper as shown below. Slide the knob to the right first, and then turn it as necessary.



9. Close the sprocket covers. Slide the sprocket units so that the paper is straight and smooth, and then lock them into place.



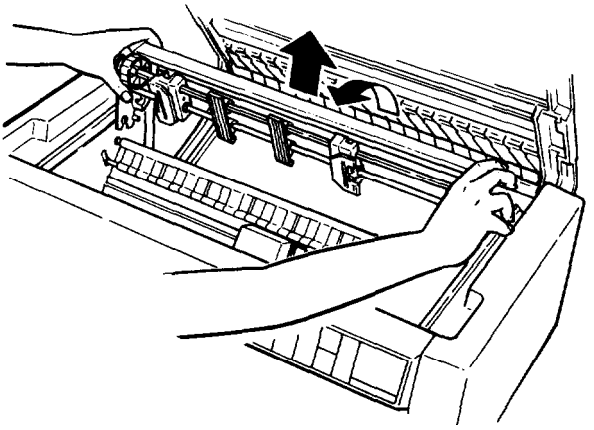
10. Adjust the top of form position as described in in Chapter 2.
11. Press the FORM FEED button to form feed the paper out the back of the printer. Make sure the edge of the first sheet emerges below the paper separator.
12. Close the top cover and press the ON LINE button so you are ready to print.

## Removing the pull tractor

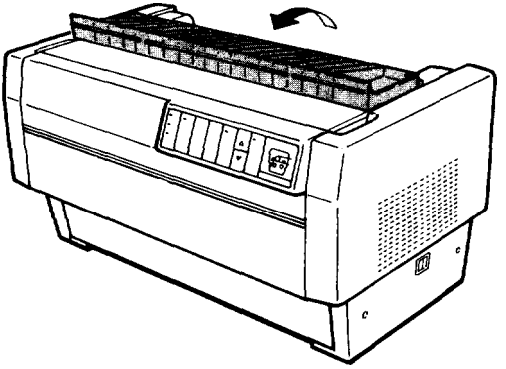
Follow these steps to remove the pull tractor. You'll need a cross-head screwdriver and the paper separator that originally was installed on the printer.

1. Remove any paper installed on the tractor and turn off the printer.

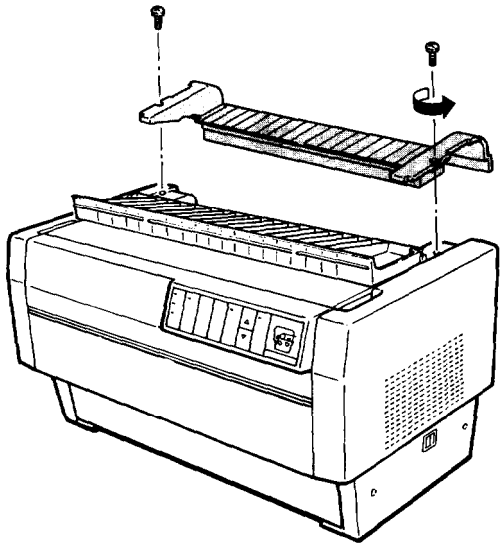
2. Open the top cover and locate the levers that lock the pull tractor in place on the printer. Pull these levers forward to release the pull tractor. Then lift the tractor up and out of the printer.



3. Close the printer's top cover and open the paper separator cover.



4. Using the cross-head screwdriver, remove the paper separator that came with the pull tractor.



5. Reinstall the original paper separator and close the paper separator cover.

## Using Interface Boards

You can use optional interface boards to supplement your printer's built-in serial and parallel interfaces. If you don't know whether you need an optional interface or if you want to know more about interfaces, contact your Epson dealer.

## Choosing an interface board

Optional interface boards can be divided into three main categories:

- IEEE-488 interfaces that provide standardized connections, trouble-free operation, and the ability to connect computers, printers, and other devices on the same line so they can share data freely.
- Coax and twinax interfaces that connect directly to the printer and communicate with an IBM minicomputer or mainframe via coax or twinax protocol. This allows Epson printers to function as local IBM printers without the addition of any other circuitry or components. These interfaces are currently available from manufacturers other than Epson.
- Serial interfaces, which are usually not necessary because the DFX-5000 has a built-in serial interface.

The following Epson interfaces are compatible with the DFX-5000.

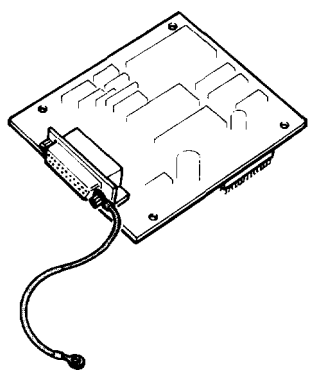
| Number | Name |
|---|---|
| #8143 | RS-232C/Current Loop interface board |
| #8148 | Intelligent serial interface board |
| #8165 | Intelligent IEEE-488 interface board |

## Installing an interface board

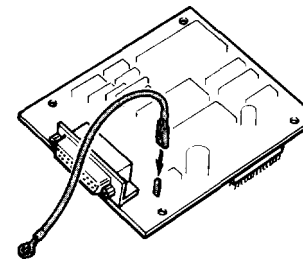
The following steps explain how to install an optional interface board. Before you install the board, disconnect the printer cable from the printer's built-in parallel interface. The built-in parallel and an optional interface should not be connected at the same time.

**Note:** If you install an optional interface board, make sure your printer's DIP switches are set for parallel interface, even if you are installing a serial interface board.

1. Turn off both your printer and your computer.
2. If the interface board comes with a FG (frame ground) wire that is not already attached to the board, attach the wire as shown below on the right.

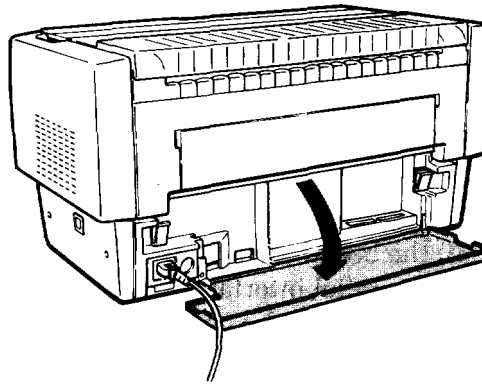


FG wire attached

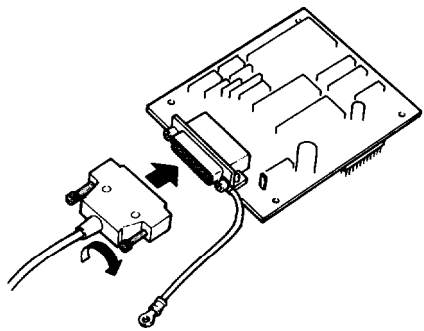


FG wire not attached

3. Open the printer's interface cover.

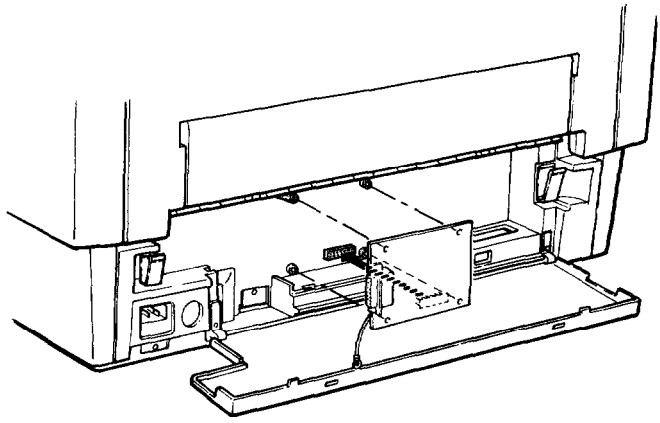


4. Plug the connector of the cable securely into the interface board as shown.

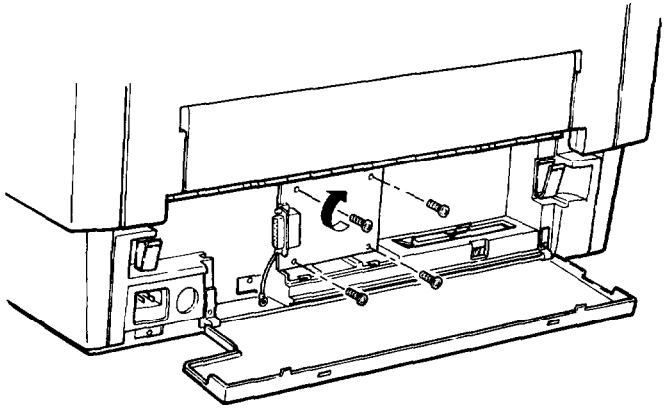


5. If the connector has tightening screws (as shown in the illustration above), use a screwdriver to secure the cable to the interface board. If the connector has clamps instead, squeeze them together to secure the cable to the interface board.

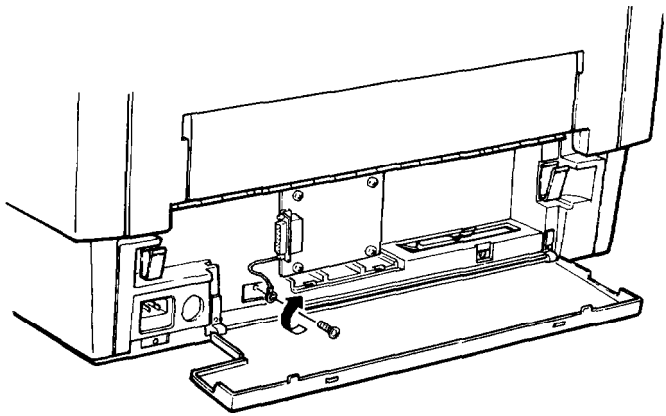
6. Place the board in the option slot, carefully inserting the pins of the board into the mating connector in the option slot.



7. Use a cross-head screwdriver to secure the board with the four screws provided.

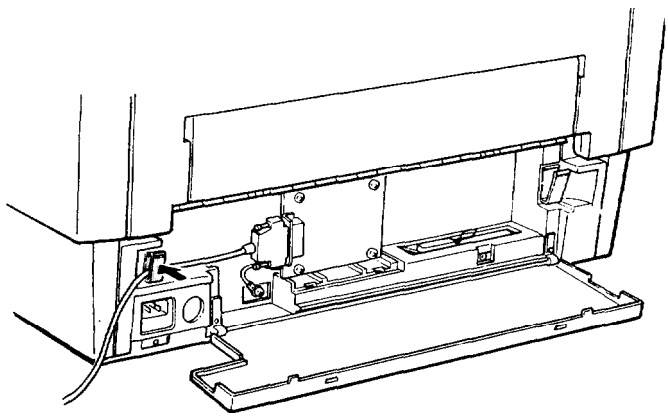


8. Remove the screw from the CG (chassis ground) connector on the printer and then use the cross-head screwdriver to connect the FG wire from the interface board to the CG connector, as shown below.



9. Set the DIP switches on the interface board according to the manual accompanying your interface board.

10. Secure the cable using the plastic clamp on the left side.



11. Close the interface cover.

Chapter 7

# Troubleshooting

## Problems and Solutions

This section discusses potential problems and their likely solutions. If you are still having problems after trying the solutions in this section, you may want to try using the data dump mode, a mode that helps advanced users determine the causes of communication problems between the printer and the computer. See the section on the data dump mode at the back of this chapter for more information.

Below are some possible problems you may encounter and their solutions.

### The printer does not print

- Make sure the printer is turned on and the POWER light is on. If the printer is turned on but the POWER light is not on, check to see that the printer is fully plugged in and that the electrical outlet is also turned on.
- Make sure the top cover is closed and the ON LINE light is on. If the ON LINE light is not on, press the ON LINE button to put the printer back on line.
- Make sure the printer is connected securely to the computer. Check both ends of the cable between the printer and the computer.
- Make sure the printer is not out of paper. (The PAPER OUT light should be off and the tractor arrow on the PAPER SELECT indicator should be green.)
- Make sure the correct tractor arrow is lit up on the PAPER SELECT indicator. If the wrong tractor is selected, make sure there is paper loaded in standby position on the tractor you want to use, and then press the FRONT/REAR button to switch to that tractor. See the sections on loading paper in Chapter 2.

- Make sure that all protective materials are removed. If not, turn off the printer, remove the protective materials, and turn the printer back on. See the section on removing protective materials in Chapter 1.

If the printer still does not print, disconnect the printer from the computer and try the self test described in Chapter 1. If the self test works properly, the printer is working and the problem probably lies in the computer, the software, or the cable. If the self test does not work, contact your Epson dealer.

## The printer stops printing

- The printer may be out of paper. Check the paper supply.
- The paper may be jammed. Remove the jammed paper and reload. See the sections on loading paper in Chapter 2.
- The ribbon may be jammed. This problem is usually caused by too much slack or a worn ribbon. See the section on replacing the ribbon in Chapter 5.
- The top cover may be open. If the top cover is opened during printing, the printer beeps four times and stops printing. To resume printing, close the top cover and press the ON LINE button.
- If the ON LINE light is flashing, the print head is overheated. Wait several minutes until the print head cools. Printing resumes when the head cools.
- If the printer stops and the beeper sounds, turn the printer off and check for paper jams or other problems. Then turn it back on and try to print again. If the printer beeps again and does not print, take it to a qualified service person.

### The printout is spaced incorrectly

- If all the text is printed on the same line, no line feed command is being sent at the end of each line of text. Turn DIP switch 2-4 on.
- If the printer is inserting extra blank lines between lines of text, extra line feed commands are being sent. Turn DIP switch 2-4 off.
- If the printer inserts extra blank lines even when DIP switch 2-4 is turned off, you need to disable the AUTO FEED XT signal coming from your computer. See your Epson dealer for assistance.

### The printout is faint or uneven

- The ribbon may not be properly installed. See the section on installing the ribbon in Chapter 1.
- The ribbon may be worn out. See the section on replacing the ribbon in Chapter 5.
- The print head may be worn out. This is especially likely if parts of printed characters are missing. Contact your dealer to have the head replaced. Never attempt to replace the head yourself because other parts of the printer should be checked at the same time.

### The printout is not what you expect

- The wrong character table (italics or Epson Extended Graphics) may be selected. See the section on selecting character tables with DIP switches in Chapter 3. You can also select the character table with a software command. (See the Command Summary in Chapter 8.)

- The printer may not be securely connected to the computer. Check both ends of the cable between the printer and the computer.
- Your software's font, page layout, printer port, or other printer settings may not be selected properly. Make sure your software is correctly set up for your printer and that you specify continuous-feed paper as the type of form.
- If the printing is too high or low on the page, adjust it by following the instructions in the sections in Chapter 2 on adjusting the top of form position and adjusting the printing position.
- Your application program may be changing the SelecType or DIP switch settings. Use the program's setup procedure to remove the interfering codes, or use the printer control codes for your application program instead of SelecType or DIP switches. See your software manual for more information on removing interfering codes. Also, for more information on sending printer commands, see the section on sending commands to the printer in Chapter 4.
- Make sure that the DIP switches are set correctly for use with the built-in parallel or serial interface. See the section on DIP switch settings for interface type, parity, and baud rate in Chapter 3. You can also check the DIP switch settings by running the self test. (See Chapter 1.)
- If you are using an optional interface board, make sure that DIP switches 2-5 and 2-6 are set for parallel, regardless of whether the optional board is parallel or serial. See the section on DIP switch settings for interface type in Chapter 3. Also, make sure that the DIP switches on the interface board are set according to the instructions in the interface board manual.

### Paper does not feed properly

- The paper may not be mounted on the sprockets correctly. Make sure the sprocket holes of the paper fit correctly over the sprockets.
- Make sure the sprockets are positioned to match the width of your paper and that they are locked in place with their covers closed.
- Check the paper on the tractor's sprockets to make sure it is not ripped, jammed, or skewed. If something is wrong with the paper, tear off the paper below the tractor and press FORM FEED to eject the remaining paper. Then load fresh paper, making sure the first sheet has a clean, straight edge.
- The paper supply may be too far from the printer, or not aligned with the front or rear tractor. Also, there may be some obstacle in the way of the paper or something on top of the paper supply. If you use the rear tractor, make sure that your printed documents do not interfere with the rear paper supply. See Chapter 2 for instructions on the proper placement of the paper supply.
- If you are trying to feed paper using one of the control panel buttons, make sure the printer is off line.
- If you are using labels, there are extra paper handling precautions you must take. See the section in Chapter 2 on using labels.

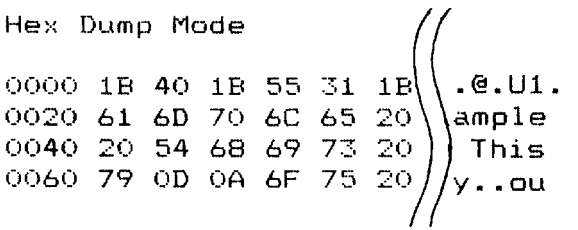
## Data Dump Mode

The printer has a special feature to make it easy for experienced users to find the cause of communication problems between the printer and application programs. In data dump mode, an exact printout of the codes reaching the printer is produced.

To use the data dump mode, follow these steps:

1. To enter the data dump mode, hold down the FORM FEED and LINE FEED buttons at the same time while you turn on the printer.

2. Next, run either an application program or one you have written in any programming language. Your printer prints all the codes sent to the printer in hexadecimal format as shown below:




3. To turn off the data dump mode, press the ON LINE button to take the printer off line, and then turn off the printer. (The data dump mode can also be cancelled by sending an INIT signal from the computer.)

Look at the data dump shown in Step 2. By comparing the characters printed in the right column with the printout of the hexadecimal codes, you can check what codes are being sent to the printer. If characters are printable, they appear as their true ASCII characters. Nonprintable codes, such as control codes, are represented by dots.

As an example of how to interpret a data dump printout, look at the first five hex codes on the first line of the printout sample (1B 40 1B 55 31). Each hex 1B represents the Escape code, 40 represents @, 55 represents U, 31 represents the numeral 1. Check the first line of the right column and you will find a dot, an @ sign, another dot, a U, and a 1. If you look in the Command Summary in Chapter 8, you will see that these are the commands to initialize the printer and turn on unidirectional mode.

Chapter 8

# Command Summary

## Using the Command Summary

This chapter lists and describes all the commands available on the DFX.

The first part of this chapter lists all commands in numerical order and gives the page number where each is fully described. If you know which command you are looking for, consult the numerical list to find the number of the page where it is described.

The Quick Reference card at the end of the book also contains a list of the commands divided by topic, with page number references that direct you to full explanations of the commands.

The second part of this chapter lists and describes each command separately; the commands are divided into the following subjects:

Printer operation
Data control
Vertical motion
Horizontal motion
Overall printing style
Print size and character width
Print enhancement
Word processing
Character sets
User-defined characters
Graphics

Each command has a format section and a comment section. The format section gives the ASCII, decimal, and hexadecimal values for the command; the comment section describes the effect of the command and gives any additional information necessary for using it.

All three formats are equivalent, and it should be easy to pick the one most suited to your purpose.

Note: Some application programs can use control key sequences. See the Control Key chart on page 8-4 for information on using these.

The simplest type of command consists of a single character to be sent to the printer. For instance, to print in condensed mode the code format is:

| | |
|---|---|
| ASCII code: | SI |
| Decimal: | 15 |
| Hexadecimal: | 0F |

This code can be sent from a program by sending the code 15 directly.

More complex commands consist of two or more character codes. For example, to print in double-wide mode the code format is the following:

| | | | |
|---|---|---|---|
| ASCII code: | ESC | W | *n* |
| Decimal: | 27 | 87 | *n* |
| Hexadecimal: | 1B | 57 | *n* |

In this case *n* can be either 1 or 0, to begin or end double-wide printing. You can use either of the following commands to turn ON double-wide print from BASIC:

```
LPRINT  CHR$(27);CHR$(87);CHR$(l)
LPRINT  CHR$(27);"W";CHR$(l)
```

For the following commands that use only 0 or 1 for the variable, either the decimal or hexadecimal values 1 and 0 or the ASCII characters 1 and 0 can be used:

ESC U, ESC x, ESC p, ESC W, ESC S, ESC-, and ESC %

For example, in BASIC you can turn on proportional spacing with either of these statements:

```
LPRINT  CHR$(27);"p";CHR$(1)
LPRINT  CHR$(27);"p";"1"
```

## Control Key Chart

Some application programs can use control key codes for decimal values 0 through 27. The table below gives you the proper values. The Control Key column indicates that you press the control key at the same time you press the key for the letter or symbol in that column. For example, you press the control key and A at the same time to send the value 1.

Note: Many programs use the control keys for other purposes. Also, some programs do not use all these keys.

| Dec. | Hex. | Control Key |
|---|---|---|
| 0 | 00 | @ |
| 1 | 01 | A |
| 2 | 02 | B |
| 3 | 03 | C |
| 4 | 04 | D |
| 5 | 05 | E |
| 6 | 06 | F |
| 7 | 07 | G |
| 8 | 08 | H |
| 9 | 09 | I |
| 10 | 0A | J |
| 11 | 0B | K |
| 12 | 0C | L |
| 13 | 0D | M |
| 14 | 0E | N |
| 15 | 0F | O |
| 16 | 10 | P |
| 17 | 11 | Q |
| 18 | 12 | R |
| 19 | 13 | S |
| 20 | 14 | T |
| 21 | 15 | U |
| 22 | 16 | V |
| 23 | 17 | W |
| 24 | 18 | X |
| 25 | 19 | Y |
| 26 | 1A | Z |
| 27 | 1B | [ |

## Commands in Numerical Order

This section lists all the DFX commands, with their decimal and hexadecimal values. The numbers in the columns on the right are the page numbers in this chapter where a complete description of the command can be found.

| ASCII | Dec | Hex | Description | Page |
|---|---|---|---|---|
| BEL | 7 | 07 | Beeper | 8-11 |
| BS | 8 | 08 | Backspace | 8-20 |
| HT | 9 | 09 | Tab horizontally | 8-21 |
| LF | 10 | 0A | Line feed | 8-14 |
| VT | 11 | 0B | Tab vertically | 8-17 |
| FF | 12 | 0C | Form feed | 8-13 |
| CR | 13 | 0D | Carriage return | 8-12 |
| s o | 14 | 0E | Select double-wide (1 line) | 8-27 |
| ESC SO | 14 | 0E | Select double-wide (1 line) | 8-28 |
| SI | 15 | 0F | Select condensed mode | 8-26 |
| ESC **SI** | 15 | 0F | Select condensed mode | 8-27 |
| DC1 | 17 | 11 | Select printer | 8-8 |
| DC2 | 18 | 12 | Cancel condensed mode | 8-27 |
| DC3 | 19 | 13 | Deselect printer | 8-9 |
| DC4 | 20 | 14 | Cancel double-wide (1 line) | 8-28 |
| CAN | 24 | 18 | Cancel line | 8-12 |
| ESC SP | 32 | 20 | Set intercharacter space | 8-33 |
| ESC ! | 33 | 21 | Master Select | 8-24 |
| ESC # | 35 | 23 | Cancel MSB control | 8-11 |
| ESC $ | 36 | 24 | Set absolute print position | 8-20 |
| ESC % | 37 | 25 | Select user-defined set | 8-35 |
| ESC & | 38 | 26 | Define user-defined characters | 8-34 |
| ESC * | 42 | 2A | Select graphics mode | 8-38 |
| ESC - | 45 | 2D | Turn underlining on/off | 8-31 |
| ESC / | 47 | 2F | Select vertical tab channel | 8-18 |

| ASCII | Dec | Hex | Description | Page |
|---|---|---|---|---|
| ESC 0 | 48 | 30 | Select 1/8-inch line spacing | 8-15 |
| ESC 1 | 49 | 31 | Select 7/72-inch line spacing | 8-15 |
| ESC 2 | 50 | 32 | Select l/6-inch line spacing | 8-15 |
| ESC 3 | 51 | 33 | Select n/216-inch line spacing | 8-16 |
| ESC 4 | 52 | 34 | Select italic mode | 8-31 |
| ESC 5 | 53 | 35 | Cancel italic mode | 8-32 |
| ESC 6 | 54 | 36 | Printable code area expansion | 8-36 |
| ESC 7 | 55 | 37 | Cancel ESC 6 | 8-36 |
| ESC : | 58 | 3A | Copy ROM into RAM | 8-35 |
| ESC < | 60 | 3C | Unidirectional mode (1 line) | 8-9 |
| ESC = | 61 | 3D | Set MSB to 0 | 8-10 |
| ESC > | 62 | 3E | Set MSB to 1 | 8-11 |
| ESC ? | 63 | 3F | Reassign graphics mode | 8-39 |
| ESC @ | 64 | 40 | Initialize printer | 8-8 |
| ESC A | 65 | 41 | Select n/72-inch line spacing | 8-16 |
| ESC B | 66 | 42 | Set vertical tabs | 8-17 |
| ESC C | 67 | 43 | Set page length in lines | 8-13 |
| ESC CO | 67 | 43 | Set page length in inches | 8-14 |
| ESC D | 68 | 44 | Set horizontal tabs | 8-22 |
| ESC E | 69 | 45 | Select emphasized mode | 8-29 |
| ESC F | 70 | 46 | Cancel emphasized mode | 8-29 |
| ESC G | 71 | 47 | Select double-strike mode | 8-29 |
| ESC H | 72 | 48 | Cancel double-strike mode | 8-30 |
| ESC I | 73 | 49 | Printable code area expansion | 8-36 |
| ESC J | 74 | 4A | Perform n/216-inch line feed | 8-16 |
| ESC K | 75 | 4B | Select single-density graphics | 8-37 |
| ESC L | 76 | 4C | Select double-density graphics | 8-37 |
| ESC M | 77 | 4D | Select 12 cpi | 8-25 |
| ESC N | 78 | 4E | Set skip over perforation | 8-14 |
| ESC O | 79 | 4F | Cancel skip over perforation | 8-14 |
| ESC I' | 80 | 50 | Select 10 cpi | 8-25 |
| ESC Q | 81 | 51 | Set right margin | 8-19 |
| ESC R | 82 | 52 | International character set | 8-34 |
| ESC SO | 83 | 53 | Select superscript mode | 8-30 |
| ESC S1 | 83 | 53 | Select subscript mode | 8-30 |

| ASCII | Dec | Hex | Description | Page |
|---|---|---|---|---|
| ESC T | 84 | 54 | Cancel superscript / subscript | 8-31 |
| ESC U | 85 | 55 | Turn unidirectional mode on/off | 8-10 |
| ESC W | 87 | 57 | Turn double-wide on/off | 8-28 |
| ESC Y | 89 | 59 | High-speed dbl-density graphics | 8-37 |
| ESC Z | 90 | 5A | Quadruple-density graphics | 8-38 |
| ESC \ | 92 | 5C | Set relative position | 8-21 |
| ESC ^ | 94 | 5E | Select 9-pin graphics | 8-39 |
| ESC a | 97 | 61 | Select justification | 8-32 |
| ESC b | 98 | 62 | Set vertical tabs in channels | 8-18 |
| ESC k | 107 | 6B | Select NLQ font | 8-23 |
| ESC l | 108 | 6C | Set left margin | 8-19 |
| ESC p | 112 | 70 | Turn proportional mode on/off | 8-26 |
| ESC t | 116 | 74 | Select character table | 8-33 |
| ESC x | 120 | 78 | Select NLQ or draft | 8-22 |
| DEL | 127 | 7F | Delete character | 8-12 |

## Commands Arranged by Topic

This section lists and describes all the commands.

### Printer Operation

#### Initialization:

ESC @ — Initialize Printer

Format:

ASCII code: ESC @
Decimal: 27 64
Hexadecimal: 1B 40

Comments:

Resets the printer mode and clears the buffer of printable data on the print line preceding the command.

#### Selection:

DC1 — Select Printer

Format:

ASCII code: DC1
Decimal: 17
Hexadecimal: 11

Comments:

Returns the printer to the selected state if it has been deselected by the printer deselect code (DC3). Does not select the printer if it has been switched off line by pressing the ON LINE button. DC1 and DC3 do not work if pin 36 on the parallel interface is low (for example, on IBM PC's and some compatible computers).

DC3 Deselect Printer

Format:

ASCII code: DC3
Decimal: 19
Hexadecimal: 13

Comments:

Puts the printer into the deselected state until select printer code (DC1) is received. The printer cannot be reselected with the ON LINE button.

**Printing direction:**

**ESC <** Select Unidirectional Mode (one line)

Format:

ASCII code: ESC <
Decimal: 27 60
Hexadecimal: 1B 3C

Comments:

Printing is normally bidirectional. This command selects unidirectional printing for one line only. (It is cancelled by a carriage return.) The print head moves to the extreme left (home) position, and printing takes place from left to right.

ESC U — Turn Unidirectional Mode On/Off

Format:

| | | | |
|---|---|---|---|
| ASCII code: | ESC | U | *n* |
| Decimal: | 27 | 85 | *n* |
| Hexadecimal: | 1B | 55 | *n* |

Comments:

The following values can be used for *n:*

1: Mode is turned ON.
0: Mode is turned OFF.

(The decimal or hexadecimal values 0 and 1 or the ASCII characters "0" and "1" can be used.)

Printing is normally bidirectional. This command selects unidirectional printing for more accurate positioning.

**MSB control:**

**Note:** MSB is the Most Significant Bit. MSB control (ESC =, ESC >, and ESC #) is not valid for graphics or user-defined characters.

ESC = (equal) — Set MSB to 0

Format:

| | | |
|---|---|---|
| ASCII code: | ESC | |
| Decimal: | 27 | 61 |
| Hexadecimal: | 1B | 3D |

Comments:

Sets the MSB of all incoming data to 0. Some computers always send data with the MSB set to 1, which means that italics or character graphics are always printed. ESC = can overcome this problem.

ESC > — Set MSB to 1

Format:

ASCII code: ESC >
Decimal: 27 62
Hexadecimal: 1B 3E

Comments:
Sets the MSB bit of all incoming data as 1.

ESC # — Cancel MSB Control

Format:

ASCII code: ESC #
Decimal: 27 35
Hexadecimal: 1B 23

Comments:
Cancels the MSB control set by ESC = or ESC >.

**Beeper:**

BEL — Beeper

Format:

ASCII code: BEL
Decimal: 7
Hexadecimal: 07

Comments:
Sounds the printer's beeper.

## Data Control

CR — Carriage Return

Format:

ASCII code: CR
Decimal: 13
Hexadecimal: 0D

Comments:

Prints the data in the buffer and returns the print position to the left margin. A line feed may be added if DIP switch 2-4 is ON or if the AUTO FEED XT line on the parallel interface is held LOW.

CAN — Cancel Line

Format:

ASCII code: CAN
Decimal: 24
Hexadecimal: 18

Comments:

Removes all text on the print line but does not affect control codes.

DEL — Delete Character

Format:

ASCII code: DEL
Decimal: 127
Hexadecimal: 7F

Comments:

Removes the last text character on the print line but does not affect control codes.

## Vertical Motion

### Form feeding:

FF — **Form** Feed

Format:

ASCII code: FF
Decimal: 12
Hexadecimal: 0C

Comments:

Prints the data in the print buffer and advances the paper to the top of the next form according to the current page length.

ESC C — Set Page Length in Lines

Format:

ASCII code: ESC C *n*
Decimal: 27 67 *n*
Hexadecimal: 1B 43 *n*

Comments:

Sets the page length to *n* lines in the current line spacing. The value of *n* must be from 1 to 127. The top of form position is set to the current line. Overrides the DIP switch page length setting.

ESC C 0 — Set Page Length in Inches

Format:

ASCII code: ESC C 0 *n*
Decimal: 27 67 0 *n*
Hexadecimal: 1B 43 00 *n*

Comments:

Sets the page length to *n* inches. The value of *n* must be from 1 to 22. The top of form position is set to the current line. Overrides the DIP switch page length setting.

ESC N — Set Skip Over Perforation

Format:

| | | | |
|---|---|---|---|
| ASCII code: | ESC | N | *n* |
| Decimal: | 27 | 78 | *n* |
| Hexadecimal: | 1B | 4E | *n* |

Comments:

The variable *n* is the number of lines skipped between the last line printed on one page and the first line on the next page. For example, with the standard settings for line spacing (1/6-inch), and page length (66 lines), ESC N 6 causes the DFX to print 60 lines and then skip 6. DIP switch 2-3 performs the same function. This setting is cancelled by ESC O and also by ESC C or ESC C 0. The value of *n* must be from 1 to 127.

ESC O — Cancel Skip Over Perforation

Format:

| | | |
|---|---|---|
| ASCII code: | ESC | O |
| Decimal: | 27 | 79 |
| Hexadecimal: | 1B | 4F |

Comments:

Cancels the skip over perforation set by ESC N. Overrides the setting of DIP switch 2-3.

**Line feeding:**

LF — Line Feed

Format:

| | |
|---|---|
| ASCII code: | LF |
| Decimal: | 10 |
| Hexadecimal: | 0A |

Comments:

When this command is received, the data in the print buffer is printed and the paper advances one line in the current line spacing.

ESC 0 — Select 1/8-inch Line Spacing

Format:

| | | |
|---|---|---|
| ASCII code: | ESC | 0 |
| Decimal: | 27 | 48 |
| Hexadecimal: | 1B | 30 |

Comments:

Sets the line spacing to 1/8 of an inch for subsequent line feed commands. The 0 is the *character* zero and not ASCII code 0.

ESC 1 — Select 7/72-inch Line Spacing

Format:

| | | |
|---|---|---|
| ASCII code: | ESC | 1 |
| Decimal: | 27 | 49 |
| Hexadecimal: | 1B | 31 |

Comments:

Sets the line spacing to 7/72 of an inch for subsequent line feed commands. The 1 is the character one and not lowercase L or ASCII code 1.

ESC 2 — Select 1/6-inch Line Spacing

Format:

| | | |
|---|---|---|
| ASCII code: | ESC | 2 |
| Decimal: | 27 | 50 |
| Hexadecimal: | 1B | 32 |

Comments:

Sets the line spacing to 1/6 of an inch for subsequent line feed commands. The 2 is the *character* two and not ASCII code 2. This is the default at power on.

**ESC 3** Select n/216-inch Line Spacing

Format:

| | | | |
|---|---|---|---|
| ASCII code: | ESC | 3 | *n* |
| Decimal: | 27 | 51 | *n* |
| Hexadecimal: | 1B | 33 | *n* |

Comments:

Sets the line spacing to n/216 of an inch for subsequent line feed commands. The 3 is the *character* three and not ASCII code 3. The value of *n* must be from 0 to 255.

ESC A Select n/72-inch Line Spacing

Format:

| | | | |
|---|---|---|---|
| ASCII code: | ESC | A | *n* |
| Decimal: | **27** | **65** | *n* |
| Hexadecimal: | 1B | 41 | *n* |

Comments:

Sets the line spacing to n/72 of an inch for subsequent line feed commands. The value of *n* must be from 0 to 85.

ESC J Perform n/216-inch Line Feed

Format:

| | | | |
|---|---|---|---|
| ASCII code: | ESC | J | *n* |
| Decimal: | 27 | 74 | *n* |
| Hexadecimal: | 1B | 4A | *n* |

Comments:

Advances the paper n/216 of an inch. The value of *n* must be from 0 to 255. This command produces an immediate line feed but does not affect subsequent line spacing and does not produce a carriage return.

**Vertical tabbing:**

VT — Tab Vertically

Format:

ASCII code: VT
Decimal: 11
Hexadecimal: 0B

Comments:

Advances the paper to the next tab setting in the channel selected by ESC /. If no channel has been selected, channel 0 is used. If no vertical tabs have been selected, the paper advances one line.

ESC B — Set Vertical Tabs

Format:

ASCII code: ESC B *n1 n2* ... 0
Decimal: 27 66 *n1 n2* ... 0
Hexadecimal: 1B 42 *n1 n2* ... 00

Comments:

Sets up to 16 vertical tabs in the current line spacing. Tab settings are not affected by subsequent changes in line spacing. The tab settings are entered as *n1*, *n2*, etc., all from 1 to 255, in ascending order. The 0 character indicates the end of the command. All settings are stored in channel 0 (see ESC b). ESC B 0 clears the tab settings.

## ESC b — Set Vertical Tabs in Channels

Format:

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ASCII code: | ESC | b | c | *n 1* | *n 2* | . . . | 0 |
| Decimal: | 27 | 98 | *c* | *n1* | *n2* | ... | *0* |
| Hexadecimal: | 1B | 62 | c | *n1* | *n2* | ... | 00 |

Comments:

Functions the same as ESC B, except that the variable c selects a channel for the vertical tabs, which must be between 0 to 7. Therefore, up to eight sets of vertical tabs can be set. The channels are selected by ESC /. To clear the tabs in channel c use ESC b c 0.

## ESC / — Select Vertical Tab Channel

Format:

| | | | |
|---|---|---|---|
| ASCII code: | ESC | / | c |
| Decimal: | 27 | 47 | c |
| Hexadecimal: | 1B | 2F | c |

Comments:

This command is used to select the vertical tab channel, with the value of c from 0 to 7. All subsequent vertical tab commands use the channel selected by this command. If no channel has been selected, channel 0 is used.

## Horizontal Motion

### Margins:

ESC 1 — Set Left Margin

Format:

| | | | |
|---|---|---|---|
| ASCII code: | ESC | 1 | *n* |
| Decimal: | 27 | 108 | *n* |
| Hexadecimal: | 1B | 6C | *n* |

Comments:

Sets the left margin to *n* columns in the current character size. Settings made in the proportional mode are treated as 10 cpi. This command clears previous tab settings and all previous characters in the print line. Use lowercase l (as in left), not the numeral one. The minimum space between the margins is the width of one double-wide 10 cpi character.

ESC Q — Set Right Margin

Format:

| | | | |
|---|---|---|---|
| ASCII code: | ESC | Q | n |
| Decimal: | 27 | 81 | *n* |
| Hexadecimal: | 1B | 51 | *n* |

Comments:

Sets the right margin to *n* columns in the current character size. Settings made in the proportional mode are treated as 10 cpi. This command clears previous tab settings and all previous characters in the print line. The minimum space between the margins is the width of one double-wide 10 cpi character.

**Print head movement:**

BS — Backspace

Format:

ASCII code: BS
Decimal: 8
Hexadecimal: 08

Comments:

Prints out data in the print buffer, then moves the print position one space to the left. Backspacing can be performed up to, but not beyond, the left margin setting. Do not use the BS code if ESC a 2 or ESC a 3 has been sent.

ESC $ — Set Absolute Print Position

Format:

| | | | | |
|---|---|---|---|---|
| ASCII code: | ESC | $ | *n1* | *n2* |
| Decimal: | *27* | *36* | *n1* | *n2* |
| Hexadecimal: | 1B | 24 | *n1* | *n2* |

Comments:

This sequence specifies the distance from the currently set left margin that subsequent characters are to be printed, using this formula: total number of dots = *n1* + (*n2* x 256). Each unit equals 1/60th of an inch. The sequence is ignored and the previous setting remains effective if the position specified is beyond the right margin. This command applies to both draft and NLQ.

ESC \ — Set Relative Position

Format:

| | | | | |
|---|---|---|---|---|
| ASCII code: | ESC | \ | *n1* | *n2* |
| Decimal: | 27 | 92 | *n1* | *n2* |
| Hexadecimal: | 1B | 5C | *n1* | *n2* |

Comments:

Determines the position (relative to the current position) at which printing of following data will start. To find *n1* and *n2*, first calculate the displacement required in 1/120ths of an inch. Send the resulting number using this formula: total number of dots = *n1* + ( *n2* x 256). If the displacement is to the left, subtract the number from 65536 before you use the formula. The command is ignored if it would move the print position outside the current margins. This command applies to both draft and NLQ.

**Horizontal tabbing:**

HT — Tab Horizontally

Format:

| | |
|---|---|
| ASCII code: | HT |
| Decimal: | 9 |
| Hexadecimal: | 09 |

Comments:

Advances the print position to the next horizontal tab setting. The default settings are at intervals of eight characters in the default character size, and tab positions are not affected by subsequent changes in character size.

ESC D — Set Horizontal Tabs

Format:

| | | | | | | |
|---|---|---|---|---|---|---|
| ASCII code: | ESC | D | *n1* | *n2* | ... | *0* |
| Decimal: | *27* | 68 | *n1* | *n2* | ... | *0* |
| Hexadecimal: | 1B | 44 | *n1* | *n2* | ... | 00 |

Comments:

This command allows setting of up to 32 horizontal tabs, which are entered as *n1*, *n2*, *n3*, etc. (from 1 to 255) with the 0 character or any value less than the previous one terminating the command. ESC D 0 clears all tabs. The settings on power up or after an ESC @ command are every eight characters. The tab settings do not change if the character size is changed. For proportional printing the size of 10 cpi characters determines the tab positions.

## Overall Printing Style

ESC x — Select Near Letter Quality or Draft

Format:

| | | | |
|---|---|---|---|
| ASCII code: | ESC | | *n* |
| Decimal: | *27* | 120 | *n* |
| Hexadecimal: | 1B | 78 | *n* |

Comments:

The following values can be used for *n:*

0: Selects the draft mode (The decimal or hexadecimal values 0 and 1 or the ASCII characters “0” and “1” can be used.)

1: Selects the near letter quality (NLQ) mode.

When NLQ is selected, the font used is either Roman, Sans Serif or user-defined, whichever is currently selected. Condensed printing is not available in NLQ.

Format:

| | | | |
|---|---|---|---|
| ASCII code: | ESC | k | *n* |
| Decimal: | 27 | 107 | *n* |
| Hexadecimal: | 1B | 6B | *n* |

Comments:

This command affects only the near letter quality typestyle, not draft.

The following values can be used for n :
0 = Roman
1 = Sans Serif

Format:

ASCII code: ESC ! *n*
Decimal: 27 33 *n*
Hexadecimal: 1B 21 *n*

Comments:

Selects any valid combination of the modes in the table below. The variable *n* is determined by adding together the values of the desired modes from the table.

| Mode | Dec | Hex |
|---|---|---|
| 10 cpi | 0 | 00 |
| 12 cpi | 1 | 01 |
| Proportional | 2 | 02 |
| Condensed | 4 | 04 |
| Emphasized | 8 | 08 |
| Double-strike | 16 | 10 |
| Double-wide | 32 | 20 |
| Italic | 64 | 40 |
| Underline | 128 | 80 |

This command applies to both draft and NLQ. 10 cpi cannot be combined with 12 cpi, and proportional cannot be condensed. If both proportional and condensed are selected, proportional overrides condensed. Double-strike is ignored in NLQ.

## Print Size and Character Width

**ESC P** — **Select 10** cpi

**Format:**

| | | |
|---|---|---|
| ASCII code: | **ESC** | **P** |
| Decimal: | 27 | 80 |
| Hexadecimal: | 1B | 50 |

Comments:

Selects 10 characters per inch printing. This command is normally used to cancel 12 cpi.

**ESC M** — Select 12 cpi

Format:

| | | |
|---|---|---|
| ASCII code: | ESC | M |
| Decimal: | 27 | 77 |
| Hexadecimal: | 1B | 4D |

Comments:

Selects 12 characters per inch printing. This command is available in both draft and **NLQ.**

## ESC p — Turn Proportional Mode On/Off

Format:

| | | | |
|---|---|---|---|
| ASCII code: | ESC | p | *n* |
| Decimal: | 27 | 112 | *n* |
| Hexadecimal: | 1B | 70 | *n* |

Comments:

The following values can be used for *n:*

1: Mode is turned ON. (The decimal or hexadecimal values 0 and 1 or the ASCII characters "0" and "1" can be used.)

0: Mode is turned OFF.

The width of proportional characters varies from character to character. Therefore, a narrow letter like i receives less space than a wide letter like W. The proportional widths are given in the character tables, which appear in Appendix A. This command overrides condensed. This command is available for draft, NLQ, and user-defined characters.

## SI — Select Condensed Mode

Format:

| | |
|---|---|
| ASCII code: | SI |
| Decimal: | 15 |
| Hexadecimal: | 0F |

Comments:

Prints characters at about 60 percent of their normal width. For example, the condensed 10 cpi mode has 17 characters per inch. Proportional mode cannot be condensed, and proportional overrides condensed. This command is not available in NLQ.

ESC SI — Select Condensed Mode

Format:

ASCII code: ESC SI
Decimal: 27 15
Hexadecimal: 1B 0F

Comments:

Duplicates the SI command. This command is not available in NLQ.

DC2 — Cancel Condensed Mode

Format:

ASCII code: DC2
Decimal: 18
Hexadecimal: 12

Comments:

Cancels condensed printing set by SI, ESC SI, or DIP switch.

**SO** — Select Double-Wide Mode (one line)

Format:

ASCII code: SO
Decimal: 14
Hexadecimal: 0E

Comments:

Double-wide mode doubles the width of all characters. This mode is cancelled by a carriage return or DC4. This command is available in both draft and NLQ.

ESC SO — Select Double-Wide Mode (one line)

Format:

| | | |
|---|---|---|
| ASCII code: | ESC | SO |
| Decimal: | 27 | 14 |
| Hexadecimal: | 1B | 0E |

Comments:

Duplicates the SO command. This command is available in both draft and NLQ.

DC4 — Cancel Double-Wide Mode (one line)

Format:

| | |
|---|---|
| ASCII code: | DC4 |
| Decimal: | 20 |
| Hexadecimal: | 14 |

Comments:

Cancels one-line double-wide printing selected by SO or ESC SO, but not double-wide printing selected by ESC W or ESC !.

ESC W — Turn Double-Wide Mode On/Off

Format:

| | | | |
|---|---|---|---|
| ASCII code: | ESC | W | *n* |
| Decimal: | 27 | 87 | *n* |
| Hexadecimal: | 1B | 57 | *n* |

Comments:

The following values can be used for *n:*

1: Mode is turned ON.
0: Mode is turned OFF.

(The decimal or hexadecimal values 0 and 1 or the ASCII *characters* "0" and "1" can be used.)

Double-wide mode doubles the width of all characters. This command is available in both draft and NLQ.

## Print Enhancement

ESC E — Select Emphasized Mode

Format:

ASCII code: ESC E
Decimal: 27 69
Hexadecimal: 1B 45

Comments:

Makes text bolder by printing each dot twice, with the second dot slightly to the right of the first. This command is available in both draft and NLQ.

ESC F — Cancel Emphasized Mode

Format:

ASCII code: ESC F
Decimal: 27 70
Hexadecimal: 1B 46

Comments:

Cancels emphasized, the mode selected by ESC E. This command is available in both draft and NLQ.

ESC G — Select Double-Strike Mode

Format:

ASCII code: ESC G
Decimal: 27 71
Hexadecimal: 1B 47

Comments:

Makes text bolder by printing each line twice, with the second printing slightly below the first. Double-strike is not available in NLQ mode.

ESC H — Cancel Double-Strike Mode

Format:

| | | |
|---|---|---|
| ASCII code: | ESC | H |
| Decimal: | 27 | 72 |
| Hexadecimal: | 1B | 48 |

Comments:

Turns off the double-strike mode selected by ESC G.

ESC S0 — Select Superscript Mode

Format:

| | | | |
|---|---|---|---|
| ASCII code: | ESC | S | NUL |
| Decimal: | 27 | 83 | 0 |
| Hexadecimal: | 1B | 53 | 00 |

Comments:

Prints characters about two-thirds of the normal height in the upper part of the character space. The decimal or hexadecimal value 0 or the *character "0"* can be used in this command. It is cancelled with ESC T. This command is available in both draft and NLQ.

ESC S1 — Select Subscript Mode

Format:

| | | | |
|---|---|---|---|
| ASCII code: | ESC | S | SOH |
| Decimal: | 27 | 83 | 1 |
| Hexadecimal: | 1B | 53 | 01 |

Comments:

Prints characters about two-thirds of the normal height in the lower part of the character space. The decimal or hexadecimal value 1 or the character "1" can be used in this command. It is cancelled with ESC T. This command is available in both draft and NLQ.

## ESC T — Cancel Superscript/Subscript

Format:

| | | |
|---|---|---|
| ASCII code: | ESC | T |
| Decimal: | 27 | 84 |
| Hexadecimal: | 1B | 54 |

Comments:

Cancels either superscript or subscript.

## ESC - — Turn Underlining Mode On/Off

Format:

| | | | |
|---|---|---|---|
| ASCII code: | ESC | - | *n* |
| Decimal: | 27 | 45 | *n* |
| Hexadecimal: | 1B | 2D | *n* |

Comments:

The following values can be used for n:

1: Mode is turned ON. (The decimal or hexadecimal values 0 and 1 or the ASCII characters "0" or "1" can be used.)

0: Mode is turned OFF.

This mode provides continuous underlining, including spaces. This command is available in both draft and NLQ.

## ESC 4 — Select Italic Mode

Format:

| | | |
|---|---|---|
| ASCII code: | ESC | 4 |
| Decimal: | 27 | 52 |
| Hexadecimal: | 1B | 34 |

Comments:

Causes italic characters to be printed. This command is valid even if the Epson Extended Graphics character set has been selected by ESC t or the DIP switch 1-3, but character graphics cannot be italicized. This command is available in both draft and NLQ.

ESC 5 — Cancel Italic Mode

Format:

| | | |
|---|---|---|
| ASCII code: | ESC | 5 |
| Decimal: | 27 | 53 |
| Hexadecimal: | 1B | 35 |

Comments:

Cancels the mode selected by ESC 4. This command is available in both draft and NLQ.

## Word Processing

ESC a — Select Justification

Format:

| | | | |
|---|---|---|---|
| ASCII code: | ESC | | *n* |
| Decimal: | 27 | 97 | *n* |
| Hexadecimal: | 1B | 61 | *n* |

Comments:

The following values can be used for *n:*

0: Selects left justification.
1: Selects centering.
2: Selects right justification.
3: Selects full justification.

The default setting is $n = 0$. Full justification *(n = 3)* is performed when the buffer becomes full. The commands HT and BS are invalid except in $n = 0$ mode. For $n = 3$ there must be no carriage returns within a paragraph. This command is available in both draft and NLQ.

ESC SP (space) Set Intercharacter Space

Format:

| | | | |
|---|---|---|---|
| ASCII code: | **ESC** | **S P** | *n* |
| Decimal: | 27 | 32 | *n* |
| Hexadecimal: | 1B | 20 | *n* |

Comments:

Sets the amount of space added to the right of each character, in addition to the space already allowed in the design of the character. The number of units of space is equal to n, which should be from 0 to 127. Each unit of space is 1/120th of an inch. This command is available in both draft and NLQ.

## Character Sets

ESC t Select Character Table

Format:

| | | | |
|---|---|---|---|
| ASCII code: | ESC | t | *n* |
| Decimal: | 27 | 116 | *n* |
| Hexadecimal: | 1B | 74 | *n* |

Comments:

The following values can be used for n:

0: Selects italic character set.

1: Selects Epson Extended Graphics character set.

Selects the character table used by ASCII codes 128 through 255. Selecting Epson Extended Graphics does not disable italic printing. Italic printing can still be selected by ESC 4. Duplicates and overrides the function of DIP switch 1-3. Note that the value of *n* must equal 00 hex or 01 hex; the *characters* "0" and "1" cannot be used. See Appendix A for the character tables.

Format:

| | | | |
|---|---|---|---|
| ASCII code: | ESC | R | *n* |
| Decimal: | 27 | 82 | *n* |
| Hexadecimal: | 1B | 52 | *n* |

Comments:

See the section on international character sets in Chapter 3 for full information on international character sets. The following values can be used for *n:*

| | | |
|---|---|---|
| 0=USA | 5=Sweden | 9=Norway |
| 1=France | 6=Italy | 10=Denmark II |
| 2=Germany | 7=Spain I | 11 =Spain II |
| 3=UK | 8=Japan | 12=Latin America |
| 4=Denmark I | | |

Overrides the DIP switch settings for international characters. This command is available in both draft and NLQ.

## User-Defined Characters

ESC & Define User-Defined Characters

Format:

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ASCII code: | ESC | & | NUL | *d1* | *d2* | ... | *dn* |
| Decimal: | 27 | 38 | 0 | *d1* | *d2* | ... | *dn* |
| Hexadecimal: | 1B | 26 | 00 | *d1* | *d2* | ... | *dn* |

Comments:

This command defines characters.

## ESC : Copy ROM into RAM

Format:

| | | | | | |
|---|---|---|---|---|---|
| ASCII code: | ESC | : | 0 | *n* | 0 |
| Decimal: | 27 | 58 | 0 | *n* | 0 |
| Hexadecimal: | 1B | 3A | 00 | *n* | 00 |

Comments:

This command copies the characters in the ROM into RAM so that specific characters can be redefined. The following values can be used for n:

0: Roman

1: Sans Serif

## ESC % Select User-Defined Set

Format:

| | | | |
|---|---|---|---|
| ASCII code: | ESC | % | *n* |
| Decimal: | 27 | 37 | *n* |
| Hexadecimal: | 1B | 25 | *n* |

Comments:

ESC & is required to define the character set. The following values can be used for n:

0: Selects the normal set.

1: Selects the user-defined set.

For NLQ characters, also send ESC x 1.

## ESC 6 — Printable Code Area Expansion

Format:

| | | |
|---|---|---|
| ASCII code: | ESC | 6 |
| Decimal: | 27 | 54 |
| Hexadecimal: | 1B | 36 |

Comments:

Enables the printing of codes 128 through 159 (decimal) as characters, not control codes. See Appendix A for the characters that are printed with these codes.

## ESC 7 — Cancel ESC 6

Format:

| | | |
|---|---|---|
| ASCII code: | ESC | 7 |
| Decimal: | 27 | 55 |
| Hexadecimal: | 1B | 37 |

Comments:

This code causes codes 128 through 159 to be treated as control codes. This is the default.

## ESC I — Printable Code Area Expansion

Format:

| | | | |
|---|---|---|---|
| ASCII code: | ESC | I | *n* |
| Decimal: | 27 | 73 | *n* |
| Hexadecimal: | 1B | 49 | *n* |

Comments:

ASCII codes 0 to 31 and 128 to 159 are usually not printable. These codes become printable upon input of the ESC I code if *n* = 1, which allows the use of these codes for user-defined characters. If *n* = 0, this command returns 0 to 31 and 128 to 159 to non-printable codes.

## Graphics

**ESC** K — Select Single-Density Graphics Mode

Format:

| | | | | |
|---|---|---|---|---|
| ASCII code: | ESC | K | *n1* | *n2* |
| Decimal: | *27* | *75* | *n1* | *n2* |
| Hexadecimal: | 1B | 4B | *n1* | *n2* |

Comments:

Turns on eight-pin single-density graphics mode (60 dots per inch). The total number of columns = *n1 + (n2 x 256).*

ESC L — Select Double-Density Graphics Mode

Format:

| | | | | |
|---|---|---|---|---|
| ASCII code: | ESC | L | *n1* | *n2* |
| Decimal: | *27* | *76* | *n1* | *n2* |
| Hexadecimal: | 1B | 4C | *n1* | *n2* |

Comments:

Turns on eight-pin double-density graphics mode (120 dots per inch). The total number of columns = *n1 + (n2 x 256).*

ESC Y — Select High-Speed Double-Density Graphics Mode

Format:

| | | | | |
|---|---|---|---|---|
| ASCII code: | ESC | Y | *n1* | *n2* |
| Decimal: | *27* | *89* | *n1* | *n2* |
| Hexadecimal: | 1B | 59 | *n1* | *n2* |

Comments:

Turns on eight-pin high-speed double-density graphics mode (120 dots per inch). The total number of columns = *n1 + ( n2 x 256).*

**ESC Z** Select Quadruple-Density Graphics Mode

Format:

| | | | | |
|---|---|---|---|---|
| ASCII code: | ESC | Z | *n1* | *n2* |
| Decimal: | *27* | *90* | *n1* | *n2* |
| Hexadecimal: | 1B | 5A | *n1* | *n2* |

Comments:

Turns on eight-pin quadruple-density graphics mode (240 dots per inch). The total number of columns = *n1 + (n2 x 256).*

**ESC *** Select Graphics Mode

Format:

| | | | | | |
|---|---|---|---|---|---|
| ASCII code: | ESC | * | *m* | *n1* | *n2* |
| Decimal: | *27* | *42* | *m* | *n1* | *n2* |
| Hexadecimal: | 1B | 2A | *m* | *n1* | *n2* |

**Comments:**

Turns on graphics mode *m.* See the table below for details on the available modes. The total number of columns = *n1 + (n2 x 256).*

| Option | Alternate Code | *m* | Horiz. density (dot/in.) |
|---|---|---|---|
| Single-density | ESC K | 0 | 60 |
| Double-density | ESC L | 1 | 120 |
| High-speed double-density* | ESC Y | 2 | 120 |
| Quadruple-density* | ESC Z | 3 | 240 |
| CRT-I | none | 4 | 80 |
| Plotter (1:1) | none | 5 | 72 |
| CRT-II | none | 6 | 90 |
| Double-density plotter | none | 7 | 144 |

'Adjacent dots cannot be printed in this mode.

ESC ? Reassign Graphics Mode

Format:

| | | | | |
|---|---|---|---|---|
| ASCII code: | ESC | ? | s | *m* |
| Decimal: | *27* | *63* | *s* | *m* |
| Hexadecimal: | 1B | 3F | *s* | *m* |

Comments:

Changes one graphics mode to another. The variable s is a character (K, L, Y or Z), which is reassigned to a mode *m* (0-7). (See ESC * for graphic modes.)

ESC ^ Select 9-Pin Graphics Mode

Format:

| | | | | | |
|---|---|---|---|---|---|
| ASCII code: | ESC | ^ | *m* | *n1* | *n2* |
| Decimal: | *27* | *94* | *m* | *n1* | *n2* |
| Hexadecimal: | 1B | 5E | *m* | *n1* | *n2* |

Comments:

Turns on 9-pin graphics mode. For this command the variable *m* defines density of print: 0 for single (60 dpi) and 1 for double (120 dpi). The total number of columns = *n1 + (n2* x 256). This mode requires two data items for each column of print.

Appendix A

# Reference Tables

## Proportional Width Table

This table lists the widths of your printer's proportional characters. The values given are in 120ths of an inch. (For example, a value of 12 is 12/120ths of an inch.) You may need to enter these widths into a special table for your word processing program so it can calculate the number of proportional characters that will fit on a line.

The characters with no code indicated are international characters or graphics. See the section on international character sets in Chapter 3 and the descriptions of the ESC R and ESC t commands in the Command Summary for information on how to use these characters.

The following width table shows each code (hexadecimal), the character, and the character's width. If there are two numbers in the width column, the second one is for the italic version of the character.

| Code | CHR | Width |
|---|---|---|
| 20 | | 12/20 |
| 21 | ! | 5/10 |
| 22 | " | 8/10 |
| 23 | # | 12/12 |
| 24 | $ | 12/11 |
| 25 | % | 12/12 |
| 26 | & | 12/12 |
| 27 | ' | 5/5 |
| 28 | ( | 6/8 |
| 29 | ) | 6/8 |
| 2A | * | 12/12 |
| 2B | + | 12/12 |
| 2C | , | 7/8 |
| 2D | - | 12/12 |
| 2E | . | 6/7 |
| 2F | / | 10/10 |

| Code | CHR | Width |
|---|---|---|
| 30 | 0 | 12/12 |
| 31 | 1 | 8/9 |
| 32 | 2 | 12/12 |
| 33 | 3 | 12/12 |
| 34 | 4 | 12/12 |
| 35 | 5 | 12/12 |
| 36 | 6 | 12/11 |
| 37 | 7 | 12/12 |
| 38 | 8 | 12/12 |
| 39 | 9 | 12/11 |
| 3A | : | 6/8 |
| 3B | ; | 6/9 |
| 3C | < | 10/10 |
| 3D | = | 12/11 |
| 3E | > | 10/9 |
| 3F | ? | 12/11 |

| Code | CHR | Width |
|---|---|---|
| 40 | @ | 12/12 |
| 41 | A | 12/12 |
| 42 | B | 12/12 |
| 43 | C | 12/12 |
| 44 | D | 12/12 |
| 45 | E | 12/12 |
| 46 | F | 12/12 |
| 47 | G | 12/12 |
| 48 | H | 12/12 |
| 49 | I | 8/10 |
| 4A | J | 11/12 |
| 4B | K | 12/12 |
| 4C | L | 12/10 |
| 4D | M | 12/12 |
| 4E | N | 12/12 |
| 4F | O | 12/12 |
| 50 | P | 12/12 |
| 51 | Q | 12/12 |
| 52 | R | 12/12 |
| 53 | S | 12/12 |
| 54 | T | 12/12 |
| 55 | U | 12/12 |
| 56 | V | 12/11 |
| 57 | W | 12/12 |
| 58 | X | 10/12 |
| 59 | Y | 12/12 |
| 5A | Z | 10/12 |
| 5B | [ | 8/12 |
| 5C | \ | 10/7 |
| 5D | ] | 8/11 |
| 5E | ^ | 12/10 |
| 5F | _ | 12/12 |
| 60 | ` | 5/5 |
| 61 | a | 12/11 |
| 62 | b | 11/11 |
| 63 | c | 11/11 |

| Code | CHR | Width |
|---|---|---|
| 64 | d | 11/12 |
| 65 | e | 12/11 |
| 66 | f | 10/12 |
| 67 | g | 11/11 |
| 68 | h | 11/11 |
| 69 | i | 8/9 |
| 6A | j | 9/10 |
| 6B | k | 10/11 |
| 6C | l | 8/9 |
| 6D | m | 12/11 |
| 6E | n | 11/10 |
| 6F | o | 12/11 |
| 70 | p | 11/11 |
| 71 | q | 11/11 |
| 72 | r | 11/10 |
| 73 | s | 12/11 |
| 74 | t | 11/10 |
| 75 | u | 12/11 |
| 76 | v | 12/10 |
| 77 | w | 12/12 |
| 78 | x | 10/12 |
| 79 | y | 12/11 |
| 7A | z | 10/12 |
| 7B | { | 9/10 |
| 7C | ¦ | 5/9 |
| 7D | } | 9/10 |
| 7E | ~ | 12/12 |
|  | Ç | 12/12 |
|  | ü | 11/12 |
|  | é | 12/11 |
|  | â | 12/12 |
|  | ä | 12/11 |
|  | à | 12/11 |
|  | å | 12/11 |
|  | ç | 11/11 |
|  | ê | 12/12 |

| Code | CHR | Width |
|---|---|---|
| | ë | 12/11 |
| | è | 12/11 |
| | ï | 8/10 |
| | î | 10/11 |
| | ì | 8/10 |
| | Ä | 12/12 |
| | Å | 12/12 |
| | É | 12/12 |
| | æ | 12/12 |
| | Æ | 12/12 |
| | ô | 12/12 |
| | ö | 10/11 |
| | ò | 10/11 |
| | û | 11/11 |
| | ù | 11/11 |
| | ÿ | 12/11 |
| | Ö | 12/12 |
| | Ü | 12/12 |
| | ¢ | 11/11 |
| | £ | 12/12 |
| | ¥ | 12/12 |
| | ₧ | 12/12 |
| | f | 11/12 |
| | á | 12/12 |
| | í | 8/10 |
| | ó | 10/12 |
| | ú | 11/11 |
| | ñ | 11/12 |
| | Ñ | 12/12 |
| | ª | 12/11 |
| | º | 12/12 |
| | ¿ | 12/11 |
| | ⌐ | 12/12 |
| | ¬ | 12/12 |
| | ½ | 12/12 |
| | ¼ | 12/12 |
| | ¡ | 5/10 |

| Code | CHR | Width |
|---|---|---|
| | « | 12/12 |
| | » | 12/12 |
| B0 | ▒ | 12 |
| B1 | ▓ | 12 |
| B2 | ▓ | 12 |
| B3 | ▓ | 12 |
| B4 | ▓ | 12 |
| B5 | ▓ | 12 |
| B6 | ▓ | 12 |
| B7 | ▓ | 12 |
| B8 | ▓ | 12 |
| B9 | ▓ | 12 |
| BA | ▓ | 12 |
| BB | ▓ | 12 |
| BC | ▓ | 12 |
| BD | ▓ | 12 |
| BE | ▓ | 12 |
| BF | ▓ | 12 |
| co | ▓ | 12 |
| C1 | ▓ | 12 |
| c2 | ▓ | 12 |
| c3 | ▓ | 12 |
| c4 | ▓ | 12 |
| c5 | ▓ | 12 |
| C6 | ▓ | 12 |
| c7 | ▓ | 12 |
| C8 | ▓ | 12 |
| C9 | ▓ | 12 |
| CA | ▓ | 12 |
| CB | ▓ | 12 |
| cc | ▓ | 12 |
| CD | ▓ | 12 |
| CE | ▓ | 12 |
| CF | ▓ | 12 |
| DO | ▓ | 12 |
| D1 | ▓ | 12 |
| D2 | ▓ | 12 |

| Code | CHR | Width |
|---|---|---|
| D3 | ⊔ | 12 |
| D4 | ⊨ | 12 |
| D5 | ⊢ | 12 |
| D6 | ╟ | 12 |
| D7 | ╫ | 12 |
| D8 | ╪ | 12 |
| D9 | ┘ | 12 |
| DA | ┌ | 12 |
| DB | ■ | 12 |
| DC | ▐ | 12 |
| DE | ▌ | 12 |
| DF | ▀ | 12 |
| E0 | α | 12/12 |
| E1 | ß | 11/11 |
| E2 | Γ | 10/12 |
| E3 | π | 12/12 |
| E4 | Σ | 10/12 |
| E5 | σ | 11/12 |
| E6 | µ | 11/12 |
| E7 | τ | 12/12 |
| E8 | Φ | 10/12 |
| E9 | Θ | 12/12 |
| EA | Ω | 12/12 |
| EB | δ | 12/11 |
| EC | ∞ | 12/12 |
| ED | ø | 12/12 |
| EE | ∈ | 10/10 |
| EF | ∩ | 10/12 |
| F0 | ≡ | 11 |
| F1 | ± | 11 |
| F2 | ≥ | 11 |
| F3 | ≤ | 11 |
| F4 | ⌠ | 11 |
| F5 | ⌡ | 11 |
| F6 | ÷ | 11 |
| F7 | ≈ | 11 |

| Code | CHR | Width |
|---|---|---|
| F8 | ° | 11 |
| F9 | ∙ | 11 |
| FA | · | 11 |
| FB | √ | 11 |
| FC | n | 11 |
| FD | 2 | 11 |
| FE | ■ | 11 |
|  | ° | 8/8 |
|  | ¤ | 12/12 |
|  | ß | 11/11 |
|  | Ø | 12/12 |
|  | ø | 12/12 |
|  | ·· | 8/9 |
|  | ß | 10/12 |
|  | ¥ | 12/12 |

## Character Tables

The character tables on the next two pages are selected by setting DIP switch 1-3 or using the ESC t software command. For the Epson Extended Graphics character table, the ESC 6 and ESC 7 software commands let you select whether hex codes 80 to 9F are characters (ESC 6) or control codes (ESC 7).

In the tables the first digit of each hex code is in the top row and the second digit is in the first column. The binary digits are in the second row and second column, and the decimal codes are in the rectangle next to the character. For example, for an uppercase A, the hex code is 41, the binary code is 01000001, and the decimal code is 65.

| Hex. No. / Binary No. | 0 0000 | 1 0001 | 2 0010 | 3 0011 | 4 0100 | 5 0101 | 6 0110 | 7 0111 | 8 1000 | 9 1001 | A 1010 | B 1011 | C 1100 | D 1101 | E 1100 | F 1111 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | NUL 0 | 16 | SP 32 | 0 48 | @ 64 | P 80 | ` 96 | p 112 | à 128 | § 144 | SP 160 | 0 176 | @ 192 | P 208 | ` 224 | p 240 |
| 1 | 1 | DC1 17 | ! 33 | 1 49 | A 65 | Q 81 | a 97 | q 113 | è 129 | ß 145 | ! 161 | 1 177 | A 193 | Q 209 | a 225 | q 241 |
| 2 | 2 | DC2 18 | " 34 | 2 50 | B 66 | R 82 | b 98 | r 114 | ù 130 | Æ 146 | " 162 | 2 178 | B 194 | R 210 | b 226 | r 242 |
| 3 | 3 | DC3 19 | # 35 | 3 51 | C 67 | S 83 | c 99 | s 115 | ò 131 | æ 147 | # 163 | 3 179 | C 195 | S 211 | c 227 | s 243 |
| 4 | 4 | DC4 20 | $ 36 | 4 52 | D 68 | T 84 | d 100 | t 116 | ì 132 | Ø 148 | $ 164 | 4 180 | D 196 | T 212 | d 228 | t 244 |
| 5 | 5 | 21 | % 37 | 5 53 | E 69 | U 85 | e 101 | u 117 | ° 133 | ø 149 | % 165 | 5 181 | E 197 | U 213 | e 229 | u 245 |
| 6 | 6 | 22 | & 38 | 6 54 | F 70 | V 86 | f 102 | v 118 | £ 134 | " 150 | & 166 | 6 182 | F 198 | V 214 | f 230 | v 246 |
| 7 | BEL 7 | 23 | ' 39 | 7 55 | G 71 | W 87 | g 103 | w 119 | ¡ 135 | Å 151 | ' 167 | 7 183 | G 193 | W 215 | g 231 | w 247 |
| 8 | BS 8 | CAN 24 | ( 40 | 8 56 | H 72 | X 88 | h 104 | x 120 | ¿ 136 | Ö 152 | ( 168 | 8 184 | H 200 | X 216 | h 232 | x 248 |
| 9 | HT 9 | EM 25 | ) 41 | 9 57 | I 73 | Y 89 | i 105 | y 121 | Ñ 137 | Ü 153 | ) 169 | 9 185 | I 201 | Y 217 | i 233 | y 249 |
| A | LF 10 | 26 | * 42 | : 58 | J 74 | Z 90 | j 106 | z 122 | ñ 138 | ä 154 | * 170 | : 186 | J 202 | Z 218 | j 234 | z 250 |
| B | VT 11 | ESC 27 | + 43 | ; 59 | K 75 | [ 91 | k 107 | { 123 | ¤ 139 | ö 155 | + 171 | ; 187 | K 203 | [ 219 | k 235 | { 251 |
| C | FF 12 | 28 | , 44 | < 60 | L 76 | \ 92 | l 108 | ¦ 124 | Pt 140 | ü 156 | , 172 | < 188 | L 204 | \ 220 | l 236 | ! 252 |
| D | CR 13 | 29 | - 45 | = 61 | M 77 | ] 93 | m 109 | } 125 | À 141 | É 157 | - 173 | = 189 | M 205 | ] 221 | m 237 | } 253 |
| E | SO 14 | 30 | . 46 | > 62 | N 78 | ^ 94 | n 110 | ~ 126 | ß 142 | é 158 | . 174 | > 190 | N 206 | ^ 222 | n 238 | ~ 254 |
| F | SI 15 | 31 | / 47 | ? 63 | O 79 | _ 95 | o 111 | DEL 127 | c 143 | ¥ 159 | / 175 | ? 191 | O 207 | _ 223 | o 239 | Ø 255 |

| | Hex. No. | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hex. No. | Binary No. | 0000 | 0001 | 0010 | 0011 | 0100 | 0101 | 0110 | 0111 | 1000 | 1001 | 1010 | 1011 | 1100 | 1101 | 1100 | 1111 |
| 0 | 0000 | NUL 0 | 16 | SP 32 | 0 48 | @ 64 | P 80 | ` 96 | p 112 | Ç 128 | É 144 | á 160 | 176 | L 192 | ⊥ 208 | α 224 | ≡ 240 |
| 1 | 0001 | 1 | DC1 17 | ! 33 | 1 49 | A 65 | Q 81 | a 97 | q 113 | ü 129 | æ 145 | í 161 | 177 | ⊥ 193 | ⊤ 209 | ß 225 | ± 241 |
| 2 | 0010 | 2 | DC2 18 | " 34 | 2 50 | B 66 | R 82 | b 98 | r 114 | é 130 | Æ 146 | ó 162 | 178 | ⊤ 194 | ⊥ 210 | Γ 226 | ≥ 242 |
| 3 | 0011 | 3 | DC3 19 | # 35 | 3 51 | C 67 | S 83 | c 99 | s 115 | â 131 | ô 147 | ú 163 | 179 | ⊢ 195 | ⊔ 211 | π 227 | ≤ 243 |
| 4 | 0100 | 4 | DC4 20 | $ 36 | 4 52 | D 68 | T 84 | d 100 | t 116 | ä 132 | ö 148 | ñ 164 | ┤ 180 | ─ 196 | ⊧ 212 | Σ 228 | ⌠ 244 |
| 5 | 0101 | 5 | 21 | % 37 | 5 53 | E 69 | U 85 | e 101 | u 117 | à 133 | ò 149 | Ñ 165 | ╡ 181 | ┼ 197 | ⊩ 213 | σ 229 | ⌡ 245 |
| 6 | 0110 | 6 | 22 | & 38 | 6 54 | F 70 | V 86 | f 102 | v 118 | å 134 | û 150 | ª 166 | ╢ 182 | ⊨ 198 | ⊫ 214 | μ 230 | ÷ 246 |
| 7 | 0111 | BEL 7 | 23 | ' 39 | 7 55 | G 71 | W 87 | g 103 | w 119 | ç 135 | ù 151 | º 167 | ╖ 183 | ⊪ 193 | ⊪ 215 | τ 231 | ≈ 247 |
| 8 | 1000 | BS 8 | CAN 24 | ( 40 | 8 56 | H 72 | X 88 | h 104 | x 120 | ê 136 | ÿ 152 | ¿ 168 | ╕ 184 | ⊫ 200 | ⊭ 216 | Φ 232 | ° 248 |
| 9 | 1001 | HT 9 | EM 25 | ) 41 | 9 57 | I 73 | Y 89 | i 105 | y 121 | ë 137 | Ö 153 | ⌐ 169 | ╣ 185 | ⊮ 201 | ⊩ 217 | Θ 233 | • 249 |
| A | 1010 | LF 10 | 26 | * 42 | : 58 | J 74 | Z 90 | j 106 | z 122 | è 138 | Ü 154 | ¬ 170 | ╢ 186 | ⊯ 202 | ⊓ 218 | Ω 234 | · 250 |
| B | 1011 | VT 11 | ESC 27 | + 43 | ; 59 | K 75 | [ 91 | k 107 | { 123 | ï 139 | ¢ 155 | ½ 171 | ╖ 187 | ⊮ 203 | 219 | δ 235 | √ 251 |
| C | 1100 | FF 12 | 28 | , 44 | < 60 | L 76 | \ 92 | l 108 | ¦ 124 | î 140 | £ 156 | ¼ 172 | ╜ 188 | ⊩ 204 | 220 | ∞ 236 | n 252 |
| D | 1101 | CR 13 | 29 | - 45 | = 61 | M 77 | ] 93 | m 109 | } 125 | ì 141 | ¥ 157 | ¡ 173 | ╜ 189 | ═ 205 | 221 | ø 237 | ² 253 |
| E | 1110 | SO 14 | 30 | . 46 | > 62 | N 78 | ^ 94 | n 110 | ~ 126 | Ä 142 | ₧ 158 | « 174 | ╛ 190 | ⊩ 206 | 222 | ∈ 238 | ■ 254 |
| F | 1111 | SI 15 | 31 | / 47 | ? 63 | O 79 | _ 95 | o 111 | DEL 127 | Å 143 | ƒ 159 | » 175 | ┐ 191 | ⊥ 207 | 223 | ∩ 239 | SP 255 |

Appendix B

# Technical Specifications

# Printer Specifications

## Printing

**Printing method:** 9-pin impact dot matrix

**Printing speed:**

| Pitch | Quality | Characters/second/line |
|---|---|---|
| 10 | high-speed draft | 533 |
| 10 | normal draft | 400 |
| 10 | near letter quality | 80 |
| 12 | draft | 480 |
| 12 | near letter quality | 96 |

**Printing direction:** Bidirectional logic seeking for text printing. Unidirectional for graphics (can also be switched to bidirectional by using the proper software command).

**Line spacing:** 1/6-inch, 1 /&inch, or programmable increments of 1/216th of an inch

**Printable columns:**

| Pitch | Maximum printed characters |
|---|---|
| 10 pitch | 136 |
| 10 pitch double-wide | 68 |
| 10 pitch condensed | 233 |
| 12 pitch | 163 |
| 12 pitch double-wide | 81 |
| 12 pitch condensed | 272 |

**Buffer:** 3Kbyte (DIP switch selectable valid/invalid)

**Character fonts:**

| Font | Available pitches (char. per in.) |
|---|---|
| Epson high-speed draft | 10 |
| Epson draft | 10,12 |
| Epson Roman (NLQ) | 10,12, proportional |
| Epson Sans Serif (NLQ) | 10,12, proportional |

**Character tables:** Standard ASCII character set (plus italic characters)
13 international character sets
Epson Extended Graphics character table

## Paper

**Paper feed methods:** Built-in front push feed tractor
Built-in rear push feed tractor
Pull tractor (optional)

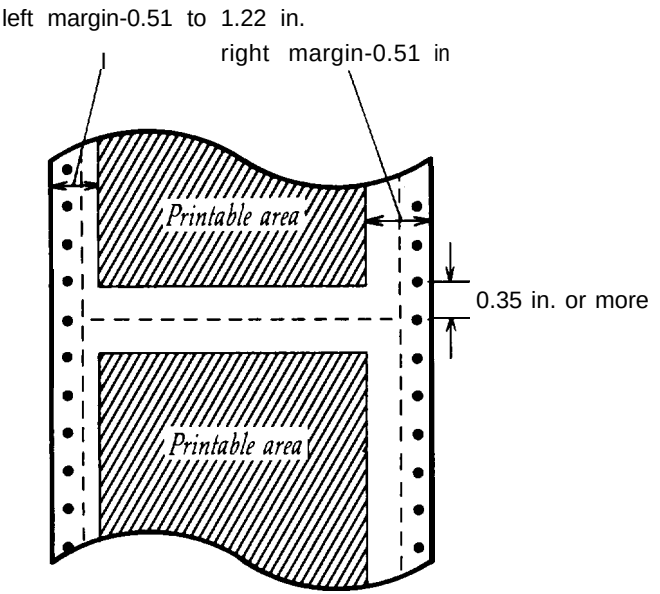
**Paper type:** Continuous-feed paper

**Paper width:** 4 to 16 inches (101.0 to 406.4mm)

**Paper feed speed:** Approx. 17ms/line at 1/6-inch line spacing during continuous feeding
Approx. 28ms/line during intermittent feeding

**Printable area:**

Continuous paper
4 to 16 inches (101 to 406.4mm)




**Paper thickness:**

Front-up to 0.018 inches
**(0.46 mm)**
Rear-up to 0.012 inches
**(0.30** mm)

**Number of copies:**

With continuous, multi-part paper only:
Front-one original plus up to five copies, maximum thickness of 0.018 inches (0.46mm)
Rear-one original plus up to three copies, maximum thickness of 0.012 inches (0.30mm)

## Mechanical

| | |
|---|---|
| **Ribbon:** | Cartridge ribbon, available in black only (#8766). Do not use ribbons for 24-pin printers. Life expectancy (in draft characters, at 14 dot/character): 15 million characters |
| **MCBF:** | For all components excluding print head: 13,500,OOO lines |
| **MTBF:** | 6000 power-on hours |
| **Print head life:** | 200 million characters at 14 dots per character |
| **Dimensions and weight:** | Height: 14.5 inches (367mm)<br>Width: 27.6 inches (700mm)<br>Depth: 15.0 inches (382.5mm)<br>Weight: approx. 65 lbs. (30kg) |

## Electrical

| | |
|---|---|
| **Voltage:** | 120 VAC ± 10%<br>220 VAC ± 10%<br>240 VAC ± 10% |
| **Power consumption:** | 600 watts maximum |
| **Frequency:** | 49.5 to 60.5 Hz |

| | |
|---|---|
| **Insulation resistance:** | 10 M ohms between AC power line and chassis |
| **Dielectric strength (between AC line and chassis):** | Can withstand 1.5 KV rms applied for 10 seconds or 1,250 V applied for one minute |

## Environmental

| | |
|---|---|
| **Temperature:** | Operation: 41°F to 95°F (5°C to 35°C)<br>Storage: -22°F to 150°F (-30°C to 65°C) |
| **Humidity:** | Operation: 10% to 80% RH without condensation<br>Storage: 5% to 85% RH without condensation |
| Shock: | Operation: Up to 1 G within 1 ms<br>Storage: Up to 2 G within 1 ms |
| **Vibration:** | Operation: Up to .025 G at up to 55 Hz<br>Storage: Up to 0.50 G at up to 55 Hz |

## Interface Specifications

The DFX-5000 is equipped with both a parallel and a serial interface.

WARNING: Do not plug in the built-in parallel interface cable and an optional interface cable at the same time because this may damage your printer. However, simultaneous attachment of the built-in serial interface cable is possible with either built-in parallel or any optional interface cable, but not both.

### Parallel interface

Connector pin assignments and a description of their respective interface signals are shown in the table on the following pages.

| Signal Pin | Return Pin | Signal | Direction | Description |
|---|---|---|---|---|
| 1 | 19 | STROBE | IN | STROBE pulse to read data in. Pulse width must be more than 0.5 microseconds at the receiving terminal |
| 2 | 20 | DATA 1 | IN | These signals represent information of the 1st to 8th bits of parallel data, respectively, Each signal IS at HIGH level when data is logical 1 and LOW when it IS logical 0. |
| 3 | 21 | DATA 2 | IN | |
| 4 | 22 | DATA 3 | IN | |
| 5 | 24 | DATA 4 | IN | |
| 6 | 25 | DATA 5 | IN | |
| 7 | | DATA 6 | IN | |
| 8 | 26 | DATA 7 | IN | |
| 9 | 27 | DATA 8 | IN | |
| 10 | 28 | ACKNLG | OUT | About a 12-microsecond pulse. LOW indicates that data has been received and that the printer IS ready to accept more data. |

## Pin assignment of the parallel interface

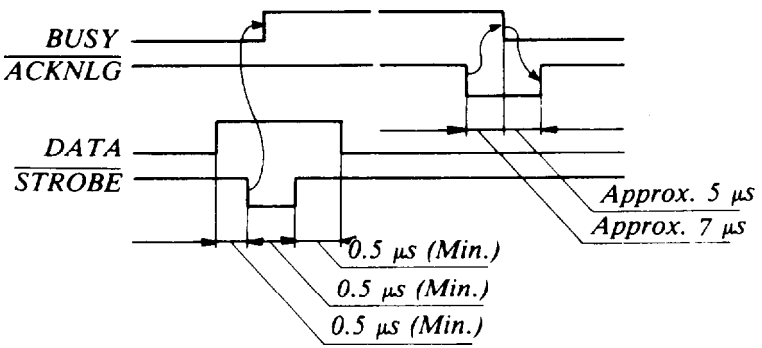
| Signal Pin | Return Pin | Signal | Direc-tion | Description |
|---|---|---|---|---|
| 11 | 29 | BUSY | OUT | A HIGH signal indicates that the printer cannot receive data. The signal goes HIGH in the following cases:<br>1) During data entry (ea. char. time)<br>2) During printing<br>3) When off line<br>4) During printer-error state. |
| 12 | 30 | PE | OUT | A HIGH signal indicates that the printer is out of paper. |
| 13 | — | — | — | Pulled up to 5 volts through 3.3K ohm resistance. |
| 14 | — | $\overline{\text{AUTO FEED XT}}$ | IN | When this signal is LOW, the paper is automatically fed 1 line after printing. (The signal level can be fixed to this by setting DIP switch 2-4 to ON.) |
| 15 | — | NC | — | Not used. |
| 16 | — | GND | — | Logic ground level. |
| 17 | — | CHASSIS GND | — | Printer's chassis ground, which is isolated from the logic ground. |
| 18 | — | NC | — | Not used. |
| 19 - 30 | — | GND | — | Twisted-pair return signal ground level. |
| 31 | — | $\overline{\text{INIT}}$ | IN | When this level becomes LOW, the printer controller is reset to its power-up state and the print buffer is cleared. This level is usually HIGH; its pulse width must be more than 50 microseconds at the receiving terminal. |
| 32 | — | $\overline{\text{ERROR}}$ | OUT | This level becomes LOW when the printer is:<br>1) in paper-out state<br>2) off line<br>3) in error state. |
| 33 | — | GND | — | Same as for Pins 19 - 30. |
| 34 | — | NC | — | Not used. |
| 35 | — | — | — | Pulled up to 5V through 3.3K ohm resistance. |
| 36 | — | $\overline{\text{SLCT IN}}$ | IN | The DC1/DC3 code is valid only when this signal is "HIGH". (Internal fixing can be carried out with Jumper J1. The level of this signal is factory-set to "LOW".) |

**Note:**

- All interface conditions are based on TTL level. Both the rise and fall of each signal must be less than 0.2 microseconds.
- Data transfer must be carried out by observing the ACKNLG or BUSY signal. (Data transfer to this printer can be carried out only after the receipt of the ACKNLG signal or when the level of the BUSY signal is LOW).
- The column heading "Direction" refers to the direction of the signal flow as viewed from the printer.
- "Return" denotes the twisted-pair return to be connected at signal ground level. For the interface wiring, be sure to use a twisted-pair cable for each signal and to complete: the connection on the return side.

**Interface timing**

The figure below shows the timing for the parallel interface.



**Printing enabled/disabled signals and control conditions**

**The** table below shows the relationship between printing being enabled or disabled, the on line/off line status, and the receipt of the data control characters, DC1 or DC3.

| ON LINE (Indicator on) | $\overline{\text{SLCT IN}}$ | DC1/DC3 (Data on/off control) | $\overline{\text{ERROR}}$ | BUSY | $\overline{\text{ACKNLG}}$ | Printing (Disabled/ enabled) |
|---|---|---|---|---|---|---|
| on line | Low (J1/ interface) | DC1/DC3 (no effect) | High | High/Low | Pulsed ea. char. | Enabled (normal cond.) |
| on line | High | DC1 Recv'd | High | High/Low | Pulsed ea. char. | Enabled |
| on line | High | DC3 Recv'd | High | High/Low | Pulsed ea. char. | Disabled* |
| off line | High/Low (no effect) | DC1/DC3 (no effect) | Low | High | Not generated | Disabled |

*While printing is disabled, character data is being received and acknowledged so that the printer can look for another DC1 character, which would allow it to resume printing.

## Serial interface

The DFX-5000 built-in serial interface is an RS-232C asynchronous interface with the following characteristics.

**Data format**

1 start bit
Data word length: 8 bits
Odd, even, or no parity
1 stop bit

**Signal level:**

Mark (1) 3V to 27V
Space (0) +3V to +27V

**Handshaking:**

Handshaking by DTR signal or X-on/X-off.

| Vacant print buffer area | Printer status | Printer status |
|---|---|---|
| Down to 512 bytes | Cannot receive input data | Send X-OFF code or sets DTR flag to 1 (Mark) |
| Rises to 784 bytes | Can receive input data | Sends X-ON code or sets DTR flag to 0 (Space) |

**Error handling:**

When a parity error is detected, your printer will print an asterisk (*). All other errors are ignored.

**Pin assignment of the serial interface**

| Signal pin | Signal | Direction | Description |
|---|---|---|---|
| 1 | FG | ——— | Chassis ground |
| 2 | TXD | OUT | Transmits data for X-ON/X-OFF |
| 3 | RXD | IN | Receives data |
| 4 - 6 | NC | | Not connected |
| 7 | SG | ——— | Signal ground |
| 8 - 10 | NC | | Not connected |
| 11, 20 | DTR | OUT | Indicates whether or not the printer is ready to receive input data |
| 12 - 19 | NC | | Not connected |
| 21 - 25 | NC | | Not connected |

- The column heading "Direction" refers to the direction of signal flow from the printer.

## Initialization

There are three ways that the printer can be initialized (returned to a fixed set of conditions) as listed in the table below.

| | |
|---|---|
| Hardware Initialization | • The printer is turned on.<br>• The printer receives an INIT signal at the parallel interface (pin 31 goes LOW). |
| Software Initialization | • Software sends the ESC @ (initialize the printer command). |

These three kinds of initialization have slightly different effects. All three methods reset the typestyle according to the default settings selected by the DIP switches inside the front cover. However, ESC @ does not initialize the printer mechanism, clear the input data buffer, or clear the user-defined character set.

## Default settings

The table below shows the default conditions that become valid when the printer is initialized.

| Item | Default condition |
|---|---|
| Print head position | Left side of carriage |
| On/off line status | On line |
| Left and right margins | Cancelled |
| Line spacing | 1/6-inch line spacing |
| Page length | Conforms to current DIP switch setting |
| Top of form position | Last setting by TOP OF FORM button |
| Tear-off position | Last setting by TEAR OFF button |
| Front/rear tractor selection | Last setting by PAPER SELECT button |
| Vertical tab position | Cleared |
| Horizontal tab position | Every eight characters |
| Character pitch | Reset to current DIP switch setting |
| Justification | Left justification |
| Special printing effects | Conforms to current DIP switch settings where applicable. Other effects are cancelled. |
| Input buffer | Hardware: Cleared<br>Software: Not cleared |
| User-defined character set | Hardware: Cleared<br>Software: Deselected only |

# Glossary

Note that these definitions apply specifically to printers. If a word is italicized, see that topic for more information.

**application program**
A software program that helps you carry out a particular task such as word processing or financial planning.

**ASCII**
American Standard Code for Information Interchange. A standardized coding system for assigning numerical codes to letters and symbols.

**automatic line feed**
When this feature is turned on using a DIP switch, each carriage return code (CR) is automatically accompanied by a line feed (LF) code.

**automatic tear-off**
A feature that feeds the paper's perforation to the tear-off position and then feeds the paper back to the top of form position. This position can be adjusted by using micro-feed when in the tear-off mode.

**baud rate**
A measure of the speed of data transmission. Usually equivalent to bits per second.

**bidirectional printing**
Printing in which the print head moves from left to right on every other line and from right to left on the others. This increases the speed of printing.

**binary**
**See** *number systems.*

**bit**
A binary digit (0 or 1), which is the smallest unit of information used by a printer or computer. See also *number systems.*

**buffer**
**See memory.**

**byte**
A unit of information consisting of eight bits.

**carriage return**
The control code that returns the print position to the left margin. When issued together with a line feed, the print position moves to the left margin of the next line. (In bidirectional printing, the print head does not always move to the left margin.)

**character set**
A collection of letters, numbers, and symbols that provides you with the characters used in a particular language.

**character table**
A portion of a character set that can be used for graphic symbols or italic characters. See also *Epson Extended Graphics* and *italics.*

**characters per inch (cpi)**
A measure of the size of text characters, often referred to as pitch. 10 cpi is the printer's default setting.

**condensed**
Printing in which each character is approximately 60% of the width of standard characters. Condensed printing is useful when printing wide tables or spreadsheets.

**continuous paper**
**Paper** that has sprocket-feed holes on each side, is perforated between pages, and comes in a folded stack. Also called fanfold paper.

**control code**
Besides the codes for printable characters, the ASCII coding system also includes 33 other codes called control codes. These control codes perform such functions as sounding the beeper and performing a carriage return or line feed.

**cpi**
*See characters per inch.*

**data dump**
A troubleshooting feature that helps advanced users detect the cause of communication problems between the printer and computer. When the printer is in data dump mode, it prints each code that it receives in hexadecimal notation and ASCII code. Also called hex dump.

**decimal**
*See number systems.*

**default**
A value or setting that takes effect when the equipment is turned on, reset, or initialized.

**DIP switches**
Small switches in a printer that control various printer functions and set the default status of the printer when it is turned on or initialized. DIP stands for dual in-line package.

**dot graphics**
A graphic design formed by patterns of dots.

**dot matrix**
A method of printing in which each letter or symbol is formed by a pattern (matrix) of individual dots.

**double-strike printing**
A way of producing bolder characters. Each character is printed twice with the second character printed slightly below the first.

**double-wide printing**
Printing in which each character is twice its normal width.

**draft**
One of three print qualities available on your printer. Draft uses less dots per character for faster printing. See also *high-speed draft* and *near letter quality*.

**emphasized printing**
A way of producing darker characters. Each character is printed twice, with the second character printed slightly to the right of the first.

**Epson Extended Graphics**
The Epson Extended Graphics character table contains international accented characters, Greek characters, and character graphics for printing lines, corners, and shaded areas.

**ESC (escape)**
A special control code used to begin most printer commands.

**ESC/P**
Abbreviation for Epson Standard Code for Printers, a system of commands that lets you control your printer using your computer's software. The system is standard for all Epson printers and supported by most application software for personal computers.

**font**
A style of type designated by a family name, such as Epson Roman or Epson Sans Serif.

**form**
In printer terminology, a form is normally the equivalent of a page.

**form feed**
A control code and a control panel button. Each advance the paper to the top of the next form.

**front tractor**
The built-in push tractor that lets you load paper from the front of the printer. This tractor features bottom feeding, which is especially useful for labels and multi-part forms.

**front tractor arrow**
The arrow-shaped light on the PAPER SELECT indicator that lights up when the front tractor is selected. The arrow is green when there is paper loaded in the tractor, even if the paper is in standby position, and red when the tractor is out of paper.

**front/rear button**
A control panel button that lets you switch tractors automatically.

**hexadecimal (hex)**
*See number systems.*

**high-speed draft**
One of three print qualities available on your printer. High-speed draft uses a minimum number of dots per character to produce extremely high-speed printing. See also *draft* and *near letter quality.*

**initialize**
To establish the initial default status of the printer by turning the printer on or sending an INIT signal.

**input buffer**
*See memory.*

**interface**
The connection between the computer and the printer. A parallel interface transmits data one character or code at a time, and a serial interface transmits data one bit at a time.

**italics**
A typestyle in which the characters slant. *This* sentence *is italicized.* Also, a character table that contains italicized characters and symbols.

**line feed**
A control code that advances the paper one line space.

**line feed/load button**
A control panel button that advances the paper one line or automatically loads paper.

**memory**
The printer, like a computer, has a memory. When you print a file from a computer, the contents of the file are transferred quickly from the computer' s memory to the printer's memory. The printer then prints information from its own memory. This frees the computer to do other work while the printer is still working. The printer memory is sometimes called the buffer, or the input buffer.

**micro-feed**
A feature that adjusts the top of form, printing, and tear-off positions.

**near letter quality (NLQ)**
One of three print qualities available on your printer. Near letter quality reduces the print speed and increases the number of dots per character to produce high-resolution characters. See also *draft* and *high-speed draft*.

**number systems**
Three number systems are commonly used with printers:

Decimal is base 10 and uses the digits 0 through 9. (This is the most familiar system.)

Hexadecimal (hex) is base 16 and uses the digits 0 through 9 and the letters A through F. This numbering system is frequently used by programmers. Any decimal number between 0 and 255 can be expressed by a two-digit hex number.

Binary is base 2 and uses only the digits 0 and 1. All information in computer systems is handled in binary form to represent electrical signals that are on or off. A binary digit is often called a bit; any decimal number between 0 and 255 can be expressed by an eight-bit binary number.

**on line**
When the printer is on line, it can communicate with the computer connected to it. The ON LINE button controls the printer's on line/off line status.

**paper bail**
The part of the printer that holds the paper flat against the platen.

**paper select indicator**
The printer icon on the far right side of the control panel. This indicator contains front and rear tractor arrows that light up to show which tractor is selected. See also *front tractor arrow* and *rear tractor arrow*.

**parallel interface**
*See interface.*

**parity**
A method for a computer and printer to check the reliability of data transmission.

**pitch**
The number of characters per inch (cpi). The standard is 10 cpi.

**platen**
The silver plate behind the paper bail that provides a backing for the printing.

**print quality**
Your printer has three types of print quality: draft, high-speed draft, and near letter quality (NLQ). Draft and high-speed draft are for high-speed, draft-quality jobs; NLQ is for final, polished documents.

**printing position**
The position on the page where text or graphics will print. This position is normally hidden behind the ribbon, but you can make it visible by pressing the TOP OF FORM button. (Make sure you press ON LINE afterward to exit.) The printing position can be adjusted using micro-feed.

**proportional printing**
Printing in which the amount of space given to each character varies. For example, an uppercase W receives much more space than a lowercase i. 'The result looks more like a typeset book than a typewritten draft.

**pull tractor**
An optional paper feeder that is useful when printing on preprinted or multi-part forms.

**push tractor**
A device that feeds continuous paper through the printer. Both the front and rear built-in tractors are push tractors; they *push* the paper through the printer to the print head.

**RAM**
Random Access Memory. The portion of the printer's memory that is used as a buffer and used for storing user-defined characters.

**rear tractor**
The built-in push tractor that feeds paper from the rear of the printer.

**rear tractor arrow**
The arrow-shaped light on the PAPER SELECT indicator that lights up when the rear tractor is selected. The arrow is green when there is paper loaded in the tractor, even if the paper is in standby position, and red when the tractor is out of paper.

**reset**
To return a printer to its defaults by sending a command or an INIT signal, or by turning the printer off and then back on again.

**self test**
A method of checking the operation of the printer. When the self test is run, the printer prints out its current DIP switch settings and the characters that are stored in its ROM.

**serial interface**
*See interface.*

**standby position**
The position the paper is in after you manually load it onto the first few pins of the tractor sprockets. When the printer switches tractors, it automatically reverses the previously loaded paper back to this position.

**tear-off button**
A button that lets you use the automatic tear-off feature. See *automatic tear-off.*

**tear-off position**
The position the printer feeds the paper to when you press the **TEAR OFF** button. This position can be adjusted using micro-feed so that the paper's perforation meets the printer's tear-off edge.

**top of form position**
The position on the paper that the printer recognizes as the first printable line. The printer feeds the paper to this position when it loads the paper. This position can be adjusted using micro-feed.

**user-defined characters**
Characters that are defined and stored in the printer by the user. Also known as download characters.

# Index

**The** commands in the command summary are not indexed here. See pages 8-l through 8-7 to find where these are described.

# EPSON”

# DFX-5000

Quick Reference

# Commands Arranged by Topic

This section lists all the DFX commands. The numbers in the columns on the right are the page numbers in Chapter 8 where a complete description of the command can be found.

## Printer operation/Data control

| Code | Dec | Hex | Function | Page |
|---|---|---|---|---|
| **ESC @** | 64 | 40 | Initialize printer | 8-8 |
| **DC1** | 17 | 11 | Select printer | 8-8 |
| **DC3** | 19 | 13 | Deselect printer | 8-9 |
| **ESC <** | 60 | 3C | Select unidirectional mode (one line) | 8-9 |
| **ESC U** | 85 | 55 | Turn unidirectional mode on/off | 8-10 |
| **ESC =** | 61 | 3D | Set MSB to 0 | 8-11 |
| **ESC >** | 62 | 3E | Set MSB to 1 | 8-11 |
| **ESC #** | 35 | 23 | Cancel MSB control | 8-11 |
| **BEL** | 7 | 07 | Beeper | 8-11 |
| **CR** | 13 | 0D | Carriage return | 8-12 |
| **CAN** | 24 | 18 | Cancel line | 8-12 |
| **DEL** | 127 | 7F | Delete character | 8-12 |

## Vertical motion/Horizontal motion

| | | | | |
|---|---|---|---|---|
| **FF** | 12 | 0C | Form feed | 8-13 |
| **ESC C** | 67 | 43 | Set page length in lines | 8-13 |
| **ESC C 0** | 67 | 43 | Set page length in inches | 8-13 |
| **ESC N** | 78 | 4E | Set skip over perforation | 8-14 |
| **ESC O** | 79 | 4F | Cancel skip over perforation | 8-14 |
| **LF** | 10 | 0A | Line feed | 8-14 |
| **ESC 0** | 48 | 30 | Select 1 / 8-inch line spacing | 8-15 |
| **ESC 1** | 49 | 31 | Select 7/ 72-inch line spacing | 8-15 |
| **ESC 2** | 50 | 32 | Select 1 / 16-inch line spacing | 8-15 |
| **ESC 3** | 51 | 33 | Select *n* / 216-inch line spacing | 8-16 |
| **ESC A** | 65 | 41 | Select *n* / 72-inch line spacing | 8-16 |
| **ESC J** | 74 | 4A | Perform *n* / 216-inch line feed | 8-16 |
| **VT** | 11 | 0B | Tab vertically | 8-17 |
| **ESC B** | 66 | 42 | Set vertical tabs | 8-17 |
| **ESC b** | 98 | 62 | Set vertical tabs in channels | 8-18 |
| **ESC /** | 47 | 2F | Set vertical tab channel | 8-18 |
| **ESC l** | 108 | 6C | Set left margin | 8-19 |
| **ESC Q** | 81 | 51 | Set right margin | 8-19 |
| **BS** | 8 | 08 | Backspace | 8-20 |
| **ESC $** | 36 | 24 | Set absolute print position | 8-20 |
| **ESC ** | 92 | 5C | Set relative print position | 8-21 |
| **HT** | 9 | 09 | Tab horizontally | 8-21 |
| **ESC D** | 68 | 44 | Set horizontal tabs | 8-22 |

## Overall printing style/Print size

| Code | Dec | Hex | Function | Page |
|---|---|---|---|---|
| **ESC x** | 120 | 78 | Select NLQ or draft | 8-22 |
| **ESC** k | 107 | 6B | Select NLC! font | 8-23 |
| **ESC** ! | 33 | 21 | Master select | 624 |
| **ESC P** | 80 | 50 | Select 10 cpi | 6-25 |
| **ESC M** | 77 | 4D | Select 12 cpi | 6-25 |
| **ESC p** | 112 | 70 | Turn proportional mode on/off | 8-26 |
| **SI (ESC SI)** | 15 | 0F | Select condensed mode | 6-26 |
| **DC2** | 18 | 12 | Cancel condensed mode | 6-27 |
| **SO (ESC SO)** | 14 | OE | Select double-wide mode (one line) | 8-27 |
| DC4 | 20 | 14 | Cancel double-wide mode (one line) | 8-28 |
| **ESC W** | 87 | 57 | Turn double-wide mode on/off | 8-28 |

## Print enhancement/Word processing

| | | | | |
|---|---|---|---|---|
| **ESCE** | 69 | 45 | Select emphasized mode | 8-29 |
| **ESC F** | 70 | 46 | Cancel emphasized mode | a-29 |
| **ESC G** | 71 | 47 | Select double-strike mode | 8-29 |
| **ESC H** | 72 | 46 | Cancel double-strike mode | 8-30 |
| **ESC SO** | a3 | 53 | Select superscript mode | 8-30 |
| **ESC S1** | 83 | 53 | Select subscript mode | 8-30 |
| **ESCT** | 64 | 54 | Cancel superscript/subscript | 8-31 |
| **ESC -** | 45 | 2D | Turn underlining on/off | 6-31 |
| **ESC 4** | 52 | 34 | Select italic mode | 8-31 |
| ESC 5 | 53 | 35 | Cancel italic mode | 8-32 |
| **ESC a** | 97 | 61 | Select justification | 6-32 |
| **ESC SP (space)** | 32 | 20 | Set intercharacter space | 8-33 |

## Character sets

| | | | | |
|---|---|---|---|---|
| **ESC t** | 1116 | 74 | Select character table | 6-33 |
| **ESCR** | 82 | 52 | International character set | 6-34 |

## User-defined characters

| | | | | |
|---|---|---|---|---|
| **ESC &** | 38 | 26 | Define user-defined characters | 8-34 |
| **ESC :** | 58 | 3A | Copy ROM to RAM | 8-35 |
| **ESC %** | 37 | 25 | Select user-defined set | 8-35 |
| **ESC 6** | 54 | 36 | Printable code area expansion | 8-36 |
| **ESC 7** | 55 | 37 | Cancel ESC 6 | 8-36 |
| **ESC I** | 73 | 49 | Printable code area expansion | 8-36 |

## Graphics

| Code | Dec | Hex | Function | Page |
|---|---|---|---|---|
| ESC K | 75 | 4B | Select single-density graphics mode | 8-37 |
| ESC L | 76 | 4c | Select double-density graphics mode | 8-37 |
| ESC Y | 89 | 59 | Select high-speed double-density graphics | 8-37 |
| ESCZ | 90 | 5A | Select quadruple-density graphics mode | 8-38 |
| ESC . | 42 | 2A | Select graphics mode | 8-38 |
| ESC ? | 63 | 3F | Reassign graphics mode | 8-39 |
| ESC ^ | 94 | 5E | Select 9-pin graphics mode | 6-39 |

## DIP switch functions

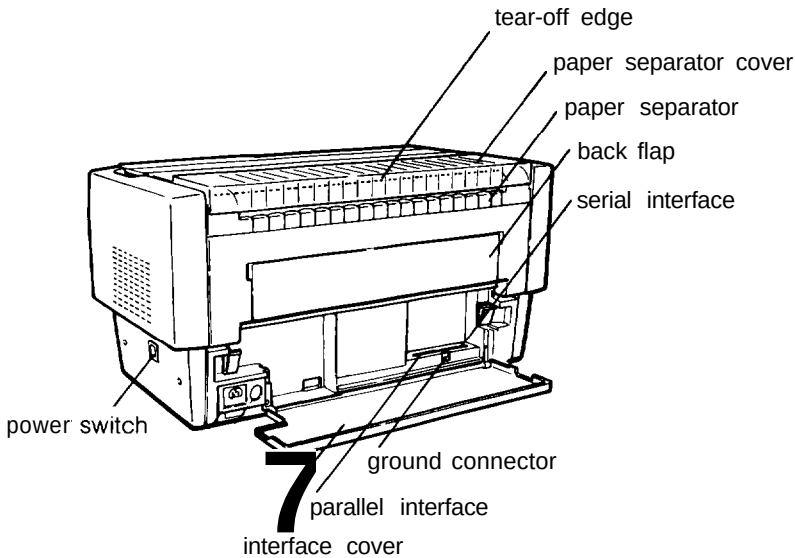
| Switch | Description | ON | OFF |
|---|---|---|---|
| 1-1 | Condensed mode on/off | Condensed | Normal |
| 1-2 | Slashed zero on/off | Slashed | Not slashed |
| 1-3 | Character table | Graphics | Italics |
| 1-4 | Input buffer | OFF | ON |
| 1-5 | NLQ or draft mode | NLQ | Draft |
| 1-6 | International character set | See table page 3-11 | |
| 1-7 | | | |
| 1-8 | | | |
| 2-1 | Page length | 12 inches | 11 inches |
| 2-2 | Draft printing speed | Normal | High |
| 2-3 | Skip over perforation | ON | OFF |
| 2-4 | Auto line feed | ON | OFF |
| 2-5 | Interface type/parity | See table below | |
| 2-6 | | | |
| 2-7 | Baud rate | See table below | |
| 2-8 | | | |

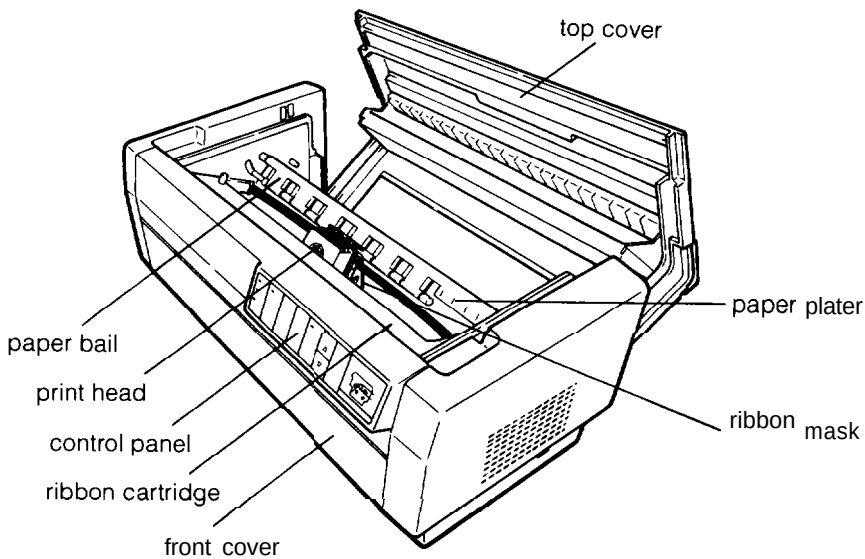
## Interface/Parity selection

| Interface type | Parity | Switch 2-5 | Switch 2-6 |
|---|---|---|---|
| Parallel | | off | off |
| Serial | Odd | cm | On |
| Serial | Even | On | off |
| Serial | None | On | O n |

## Baud rate selection

| Baud Rate | Switch 2-7 | Switch 2-8 |
|---|---|---|
| 9600 bps | off | Off |
| 4800 bps | Off | On |
| 1200 bps | On | Off |
| 300 bps | On | On |


tear-off edge
paper separator cover
paper separator
back flap
serial interface
power switch
ground connector
parallel interface
interface cover


top cover
paper plater
paper bail
print head
control panel
ribbon mask
ribbon cartridge
front cover

## EPSON OVERSEAS MARKETING LOCATIONS

**EPSON AMERICA, INC.**
20770 Madrona Avenue
Torrance CA 90503, U.S.A.
Phone: (2 13) 782.0770
Fax: (2 13) 782-5248

**EPSON DEUTSCHLAND GmbH**
Zülpicher Straße 6, 4000 Düsseldorf 11
F.R. Germany
Phone: (0211) 56030
Telex: 8584786

**EPSON UK LTD.**
Campus 100, Maylands Avenue,
Hemel Hempstead, Herts,
HP2 7EZ. U.K.
Phone: 442-61144
Telex: 5182467

**EPSON FRANCE S. A.**
68 bis, rue Marjolin 92300,
Levallois-Perret, France
Phone: (1) 4087-3737
Telex: 610657

**EPSON AUSTRALIA PTY. LTD.**
Unit 3, 17 Rodborough Road,
Frenchs Forest, NSW 2086, Australia
Phone: (2) 452-0666
Fax: (2) 975-1409

**EPSON SINGAPORE PTE. LTD.**
No. 1 Raffles Place #26-00
OUB Centre, Singapore 0104
Phone: 5330477
Fax: 5338119

**EPSON HONG KONG LTD.**
25/F, Harbour Centre,
25 Harbour Road, Wanchai,
Hong Kong
Phone: 8314600
Telex: 65542

**EPSON ELECTRONICS TRADING LTD. (TAIWAN BRANCH)**
10F. No. 287 Nanking E. Road, Sec. 3.
Taipei, Taiwan, R.O.C.
Phone: (02) 717-7360
Fax: (02) 712-9164

**EPSON ITALIA S.p.A.**
V, le F. Ili Casiraghi. 427 20099
SESTO S, GIOVANNI Ml, Italy
Phone: 2-262331
Fax: 2-2440750

**EPSON IBERICA, S.A.**
Paris, 152. 08036 Barcelona, Spain
Phone: 410-34-00
Fax: 439-95-17

**SEIKO EPSON CORPORATION (Hirooka Office)**
80 Harashinden, Hirooka
Shiojiri-shi, Nagano-ken
399-07 Japan
Phone: (0263) 52-2552

# DFX-5000

EPSON

EPSON AMERICA, INC. 2780 Lomita Boulevard, Torrance, California 90505

EPSON®

Printed in Japan 91.03-2

G-01