

LC24-30

COLOUR

USERS MANUAL

NOT INTENDED FOR SALE

VDE Statement

This device carries the VDE RFI protection mark to certify that it meets the radio interference requirements of the Postal Ordinance No. 243/1991. The additional marking "Vfg. 243/P" expresses in short form that this is a peripheral device (not operable alone) which only individually meets the Class B RFI requirements in accordance with the DIN VDE 0878 part 3/11.89 and the Postal Ordinance 243/1991.

If this device is operated in conjunction with other devices **within a set-up**, in order to take advantage of a "General (Operating) Authorization" in accordance with the Postal Ordinance 243/1991, the **complete set-up** must comply with the Class B limits in accordance with the DIN VDE 0878 part 3/11.89, as well as satisfy the preconditions in accordance with §2 and the prerequisites in accordance with §3 of the Postal Ordinance 243/1991.

As a rule, this is only fulfilled when the device is operated in a set-up which has been type-tested and provided with a VDE RFI protection mark with the additional marking "Vfg 243".

Machine Noise Information Ordinance 3. GSGV, January 18, 1991: The sound pressure level at the operator position is equal or less than 70 dB(A) according to ISO 7779.

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Guide to this manual

The LC24-30 Colour is essentially a very easy printer to use. However, it is also capable of a number of complex functions. This manual is divided into two main sections: Section 1 consists of Chapters 1 to 3, Section 2 consists of Chapters 4 to 7. A glossary, table of contents, appendix and index are also provided for reference.

For normal everyday use, you may never need to refer to Section II at all. We strongly recommend, however, that you read all of Section I before connecting and using the printer for the first time.

Section I	Chapter 1	Features and parts
	Chapter 2	Unpacking and setting up the printer, including setting up your computer system software
	Chapter 3	Using the printer, including loading paper, using the control panel, choosing different fonts and printing
Section II	Chapter 4	Printer reference, containing more detailed information on all the printer's capabilities
	Chapter 5	Information on the push tractor unit and serial-to-parallel converter
	Chapter 6	Troubleshooting guide
	Chapter 7	Information on the software commands that the printer can accept from your computer (useful for programmers)
	Appendix	Further technical information.
	Glossary	Simple explanations of printer and computer jargon

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Chapter 1

Introduction

Features

This printer, the LC24-30 Colour, lets you print sharp, impressive-looking text and graphics, and has a wide range of features that will make it an indispensable companion for your personal computer at home or in the office.

- **High speed** - the printer can print text at speeds of up to 240 characters per second.
- **Letter quality text** - the LC24-30 Colour has 11 built-in bitmapped (fixed size) fonts, featuring the following typefaces: Roman, Sanserif, Courier, Prestige, Script and Draft.
- **Scalable fonts** - for users of Windows (version 3.1 or later), 15 TrueType fonts are supplied on a floppy disk.
- **High resolution** - the printer can print at resolutions of up to 360 dots per inch.
- **Vibrant color** - the printer can print both text and graphics in a range of colors, including magenta, cyan, violet, yellow, orange and green. Each printer comes with a color ribbon as standard, allowing you to choose between black and white, and color printing.
- **Easy paper handling** - loading paper is simplicity itself, the paper tray holding up to 55 sheets of paper. Printed output can be delivered face-down (in sequential order).

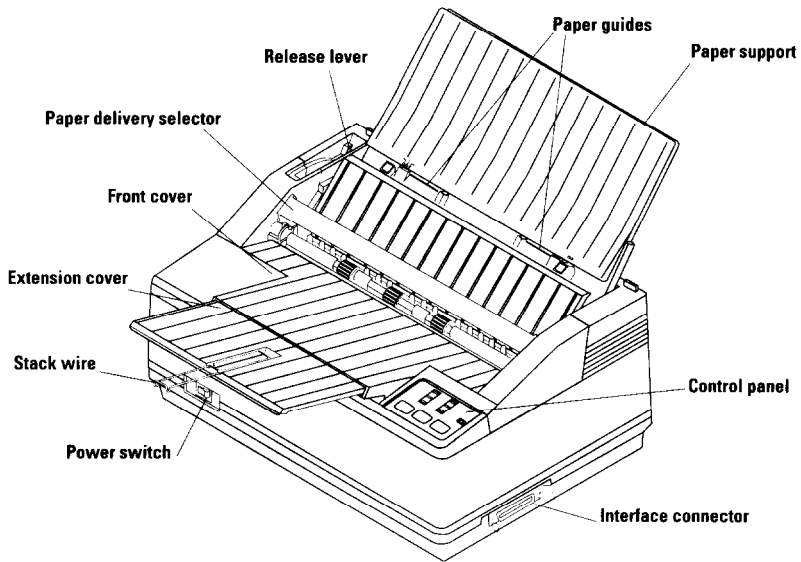
- **Easy set-up** - *Electronic DIP Switch* mode allows you to make power-on settings from the control panel. Utility software for IBM PC and compatible computers also allows you to make these settings from your computer.
- **Easy-to-use control panel** - you can control the printer's functions, make appropriate settings and determine the printer's current status by means of the control panel. The panel has only three keys and is straightforward to use.
- **Zooming** - print-outs can be scaled to 50% or 67% of actual size; in this way, wide documents, such as spreadsheets, can be printed on a single sheet of paper.
- **Landscape or portrait paper loading** - paper can be loaded into the printer in either landscape (widthwise) or portrait (upright) orientation. Landscape printing also facilitates the printing of wide documents.

Note: Letter size paper can be loaded into the printer in either landscape or portrait orientation. However, the length of a printed line is limited to a maximum of 8" (20.3cm).

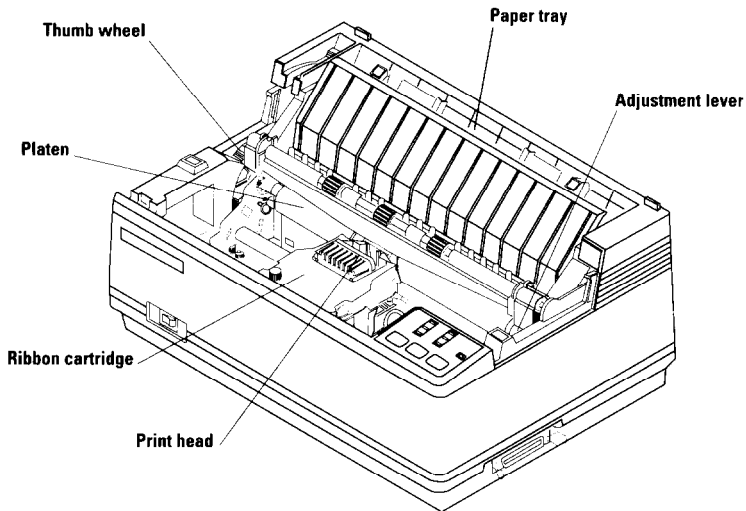
- **Automatic emulation change** - the printer supports Epson, NEC and IBM printer command sets; it can automatically sense which emulation is required and change driver accordingly.
- **Easy-to-use, long-lasting design** - the front panel, power key and interface socket are all easy to get at, and you can make most adjustments without removing the printer's front cover.

In addition to these features, the printer can print on a variety of different sizes and types of paper: single sheets (also called cut sheets), fanfold paper (continuous computer paper with holes in the edges), and multi-part forms (allowing you to print several copies at once). Single sheets can be up to 11" wide, and fanfold paper can be up to 10" wide; however, the maximum length of a printed line is limited to 8". To use fanfold paper you need to install the push tractor unit, which is available as an option.

A simple control panel operation lets you "park" fanfold paper, so that you do not have to remove it from the printer when switching to single sheets. When you want to resume printing on the fanfold paper, you can simply "unpark" it.



The printer



The printer with the front cover removed

Parts

The main components are shown in the two diagrams opposite.

The **paper guides** and **paper support** hold single-sheets, setting their position so that they are fed into the printer correctly.

The **release lever** grips single sheets as they are fed in. The lever should be pushed towards the back of the printer to hold single sheets properly, and released (pulled forward) when fanfold paper is in use.

The **front cover** protects internal components and reduces printing noise.

The **extension cover** holds printed output from the printer.

The **stack wire** supports printed output as it rests on the extension cover.

The **paper tray** holds up to 55 single sheets for feeding into the printer.

The **paper delivery selector** allows you to choose whether print-outs are delivered face-up (in reverse) for fanfold paper or face-down (in sequence) for single sheets.

The **control panel** displays information about the printer's current working and allows you to control the printer's functions and operation.

The **power switch** turns the printer on and off.

The **interface connector** accepts the cable connector that links the printer to the host computer.

The **print head** transfers the image to the paper.

The **ribbon cartridge** contains the ribbon which the head uses to mark the paper.

The **thumb wheel** lets you advance paper manually.

The **platen** guides the paper through the printer and provides a solid surface against which the print head can make an impression on the paper.

The **adjustment lever** lets you adjust the position of the print head for differing thicknesses of paper and for multi-part forms.

Chapter 2

Unpacking and setting up

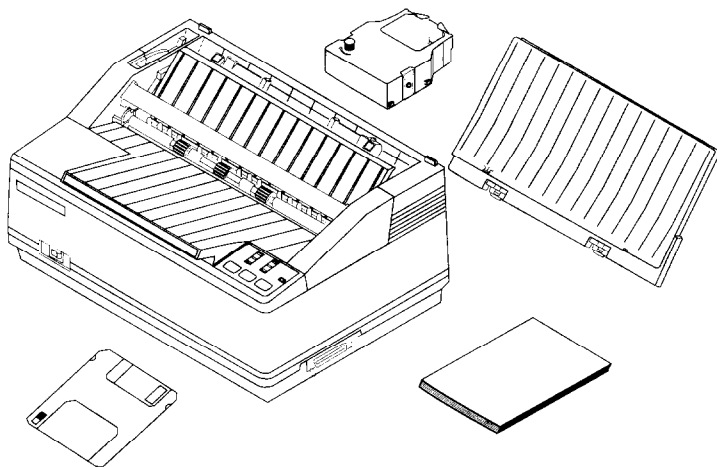
Choosing a place for the printer

Keep the following points in mind when deciding where to put your printer.

- Choose a firm, level surface where the printer will not be exposed to vibration.
- Make sure that the printer is close enough to your computer for you to connect the two with your printer cable.
- Allow 6" (15cm) of free space on either side of the printer. (If you are going to use fanfold paper, make sure that there is adequate space for paper behind the printer).
- Make sure that the printer is not in direct sunlight.
- Make sure that the printer is well away from heaters.
- Make sure that the surrounding area is clean, dry and free of dust.
- Make sure the printer is connected to a steady power supply. It should not be on the same electric circuit as appliances that cause spikes, such as copiers or refrigerators.
- Use a power supply of the voltage indicated on the printer's identification plate.
- Make sure that the room is not too humid.

Unpacking the printer

There should be five items in the box: the printer, a color ribbon cartridge, the paper support, a 3 1/2" floppy disk and this user's manual.



If anything is missing, contact the store where you bought the printer and ask them to supply the missing part.

It is a good idea to keep the original box and all the packing materials, in case you later need to pack the printer up again and send it somewhere at a later date.

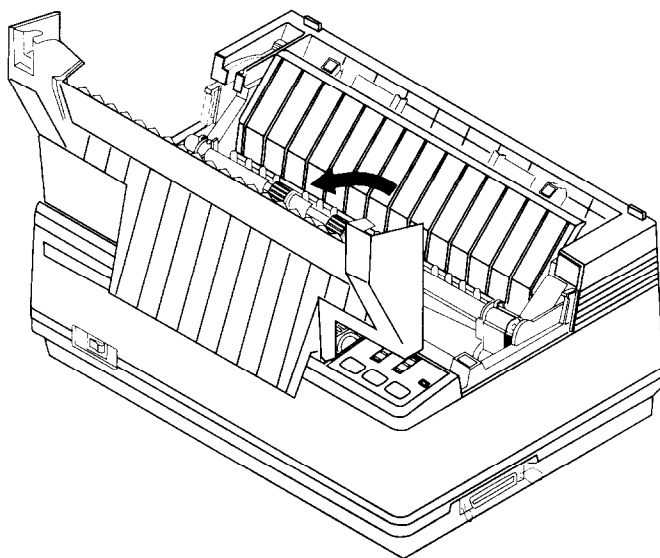
A push tractor unit (PT-10Q) and a serial-to-parallel converter (SPC-8K) are available as optional accessories. Installation of these two options is described in Chapter 5.

Preparing the printer

Place the printer in the spot you have chosen and carry out the following steps:

Opening the front cover

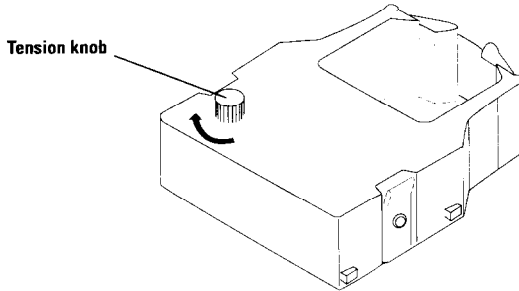
- Hook your fingers under the two small projecting tabs on either side of the front cover, grip the cover firmly and pull upwards. The front cover should open.
- Now pull the cover up and forwards so that it swings open as shown.



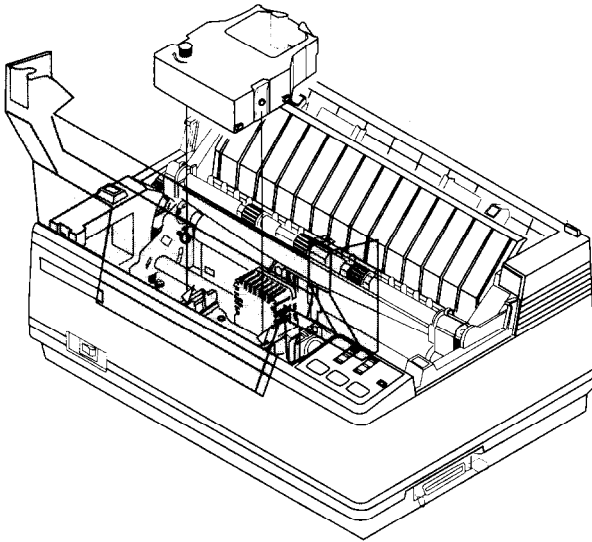
Note: If you wish, you can remove the front cover completely. However, we strongly recommend that you put it back on the printer again as soon as you have installed the ribbon cartridge. This cover prevents objects that may damage the printer from getting inside it, and also reduces printing noise.

Installing the ribbon cartridge

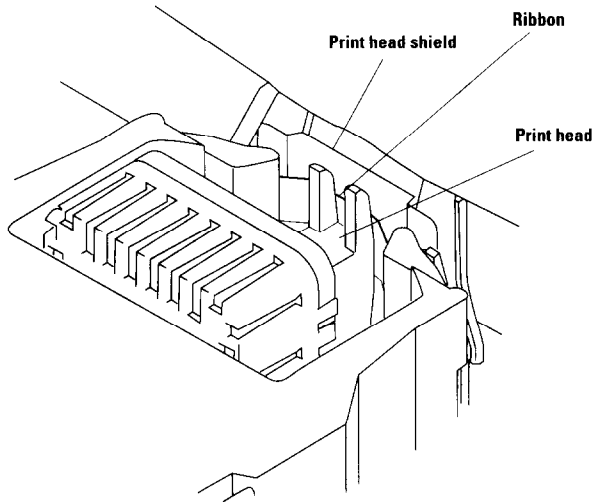
- Turn the tension knob on the cartridge clockwise, to take the slack out of the ribbon.



- Gently lower the cartridge into the cartridge holder. Make sure that the spindle on the cartridge holder fits into the socket on the base of the cartridge.



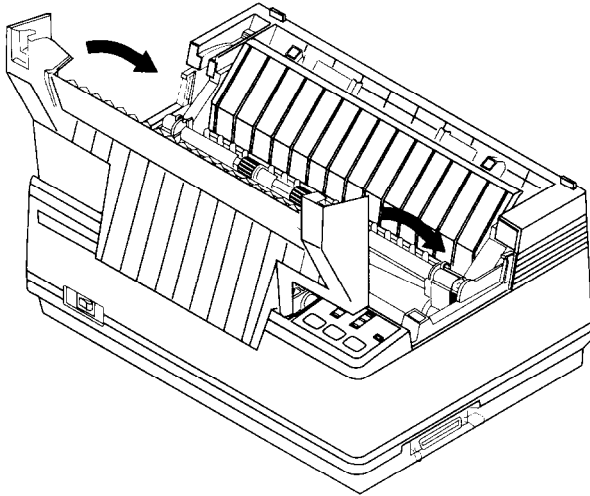
- Carefully position the ribbon between the print head and the print head shield as shown.



- Push down gently but firmly on the cartridge to make sure that it is properly in place. You should be able to feel a small amount of play (about 1/10" - 2.5mm) in the cartridge as you press down on it.
- Check that the ribbon is properly in place between the print head and print head shield. Turn the cartridge's tension knob clockwise again to take up any remaining slack.

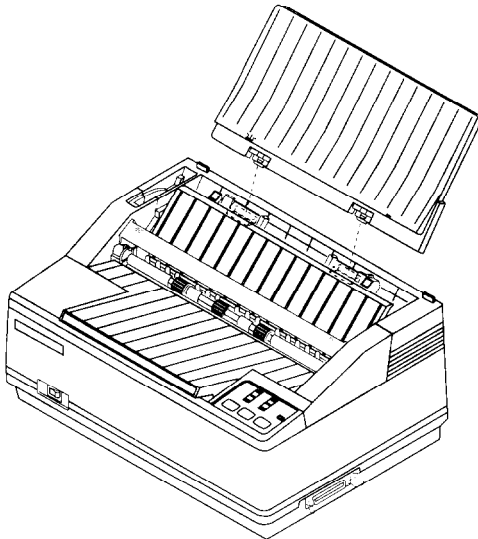
Note: It is important to make sure that the ribbon is properly positioned between the print head and print head shield. Otherwise, the quality of printed output will be poor and the ribbon may get damaged.

- Close the front cover by swinging it down and pushing down on the raised parts at the rear so that it fits firmly into place.



Fitting the paper support

- Fit the two tabs on the paper support into the rear cover slots as shown.

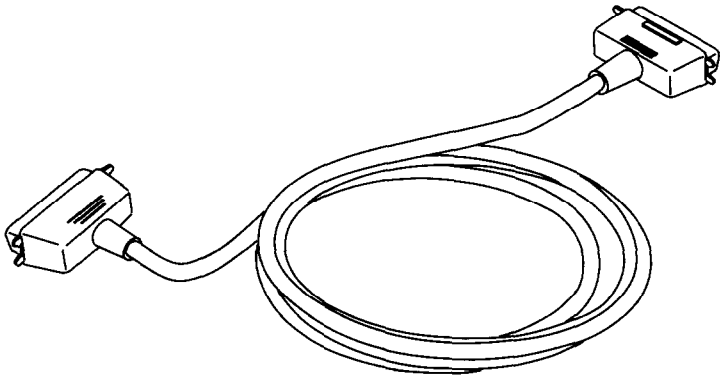


Connecting the printer to your computer

The printer and computer must be connected with a cable. The computer sends the documents that you want to print to the printer via this cable. A cable is not supplied with the printer.

Make sure that the printer and computer are both switched off before you connect them.

You will probably use a parallel cable to connect the printer to your computer. The type of parallel cable you need is a standard 36-pin Centronics parallel cable. The parallel cable should be no longer than 6' (2m). Otherwise, the transfer of information between your computer and the printer may not work properly.

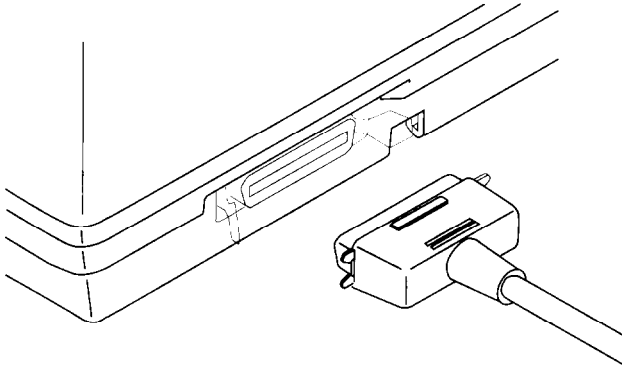


The parallel cable has a 25-pin "D-type" plug at one end, and a 36-pin Centronics connector at the other. Plug the 25-pin plug into the parallel socket on your computer. This will probably be labelled **Printer**, **Parallel**, **PRN**, **LPT1** or something similar.

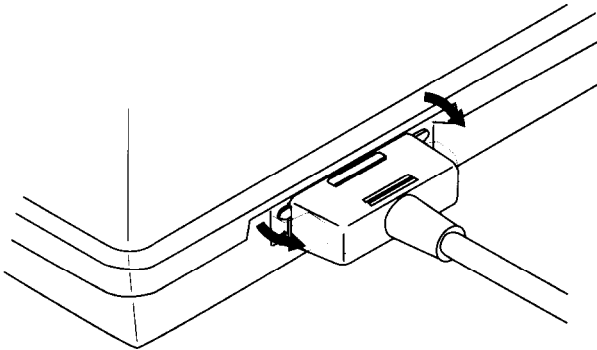
Printer



Plug the cable's Centronics connector into the socket on the side of the printer.



Secure the connector with the clips as shown.



Note: Connection using the optional serial-to-parallel converter is described in Chapter 5.

Setting up the printer in Windows

The LC24-30 Colour is ideally suited for use with computers running Microsoft Windows system software. It works best with the newest version of Windows – Windows 3.1. If you are running a version of Windows earlier than 3.1, we recommend you upgrade your software to version 3.1. In particular, Windows 3.1 will allow you to use TrueType fonts. Fifteen TrueType fonts are included on the floppy disk packaged with this printer.

To use the printer with Windows, you need to install a file known as the printer driver onto your computer. This file is supplied on the floppy disk that comes with the printer.

The following description assumes that you are using a mouse. (*Click* and *double-click* refer to the action of using the mouse to point at an item with the on-screen pointer, and then clicking either once, or twice in quick succession.)

If you are not using a mouse, you can still carry out the installation. Refer to the *Microsoft Windows User's Guide* to find out how to use the keyboard instead of a mouse to operate Windows.

To install the printer driver under Windows 3.1, use the following steps:

- Turn on the printer and start up your computer.
- If Windows does not start up automatically, type **"WIN"** and then press *Enter* or *Return*.
- Double-click the *Control Panel* icon in the *Main* window.
- Double-click the *Printers* icon
- If you have never previously installed a printer on your system under Windows 3.1, a list of supported printers is displayed. If you have already installed one or more printers, click on *Add* to display the list of supported printers.

- Click on *Install Unlisted or Updated Printer* in the list, so that this option is highlighted.
- Click *Install*. A window prompts you to put in the floppy disk supplied with the printer.
- Insert the disk with the printer driver file on it and click *OK*. A new list of printers appears.
(If you have inserted the disk into a drive other than drive A, you must type in the drive letter followed by a colon and a backslash, e.g. "**B:**" before selecting *OK*.)
- Select **LC24-30 Colour** from the new list of printers.
- Click *OK*. A list of installed printers appears, which now includes the LC24-30 Colour.
- Click on *Set As Default Printer*.
- Click on *Close* to return to the *Control Panel* window.

For instructions on how to configure the printer, see Chapter 5 of the *Microsoft Windows User's Guide*, entitled *Control Panel*.

If you cannot print from your application programs successfully after installing the driver, refer to the section *Setting up the printer with a Windows computer* on page 47 of Chapter 4.

For a description of how to install the TrueType fonts supplied on the 3 1/2" floppy disk accompanying the printer, see page 52 of Chapter 4.

Note: Windows applications always print to the currently selected default printer, unless the user chooses a different printer from within the application.

Setting up the printer in MS-DOS

IBM PC's and compatibles running MS-DOS will usually work with a printer connected to the parallel port without any special set-up.

Try printing out some text as follows:

- Turn on the printer and start up your computer.
- Type "**PRINT**" followed by the name of a text file, for example, "AUTOEXEC.BAT", and then press *Enter* or *Return*. If a message "**Name of list device [PRN]:**" comes up on the screen, press *Enter* or *Return* again.
- The printer should print out the named text file.

If you cannot print, refer to the section *Setting up the printer with an MS-DOS computer* on page 48 of Chapter 4.

To print from specific MS-DOS applications, refer to the section *Setting up the printer with an MS-DOS computer* on page 48 of Chapter 4 and, if necessary, to the application's own manual.

Note: Unlike Windows applications, MS-DOS application programs select printers individually. For each application that you use, you will have to select the printer in the application before you can print a file from it.

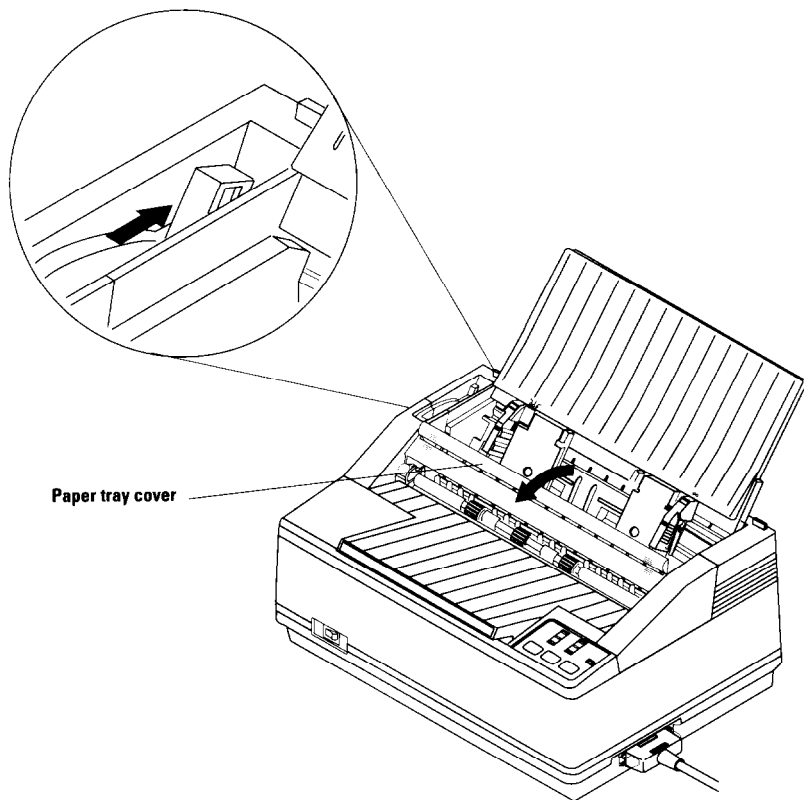
Chapter 3

Using the printer

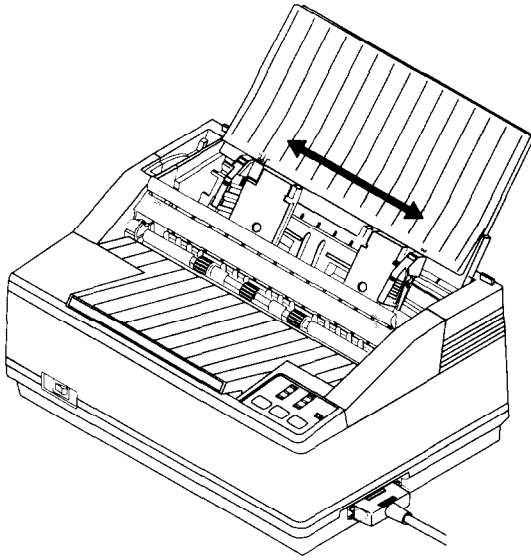
Loading paper

The paper tray can hold up to 55 sheets of paper. To load the paper, use the following steps (for a description of how to load fanfold paper refer to page 76 of Chapter 5).

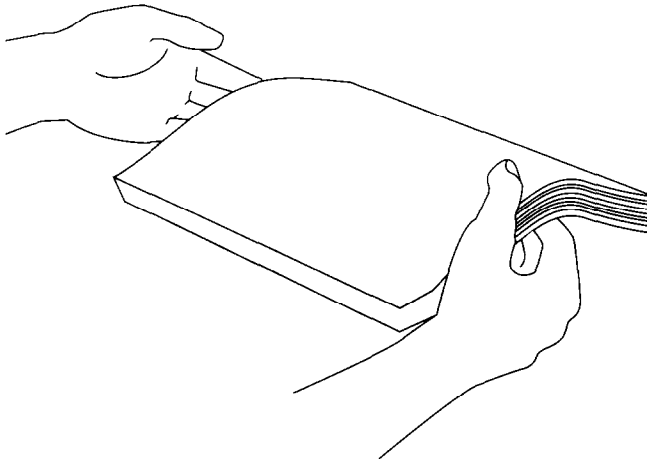
- Move the release lever towards the back of the printer and pull the paper tray cover forward.



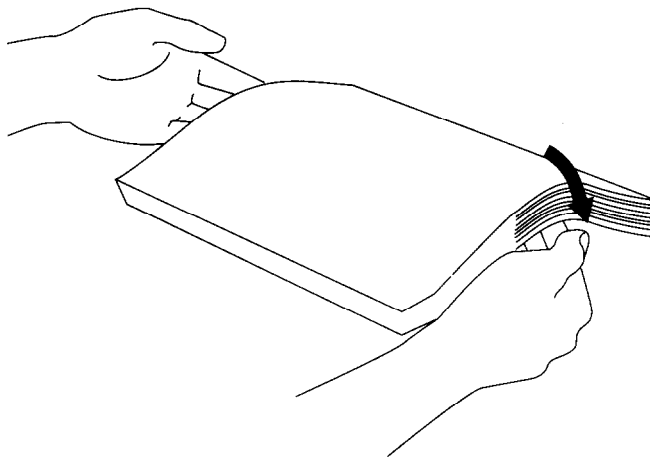
- The paper guides move freely from side to side. Adjust the left-hand paper guide to the position you want.



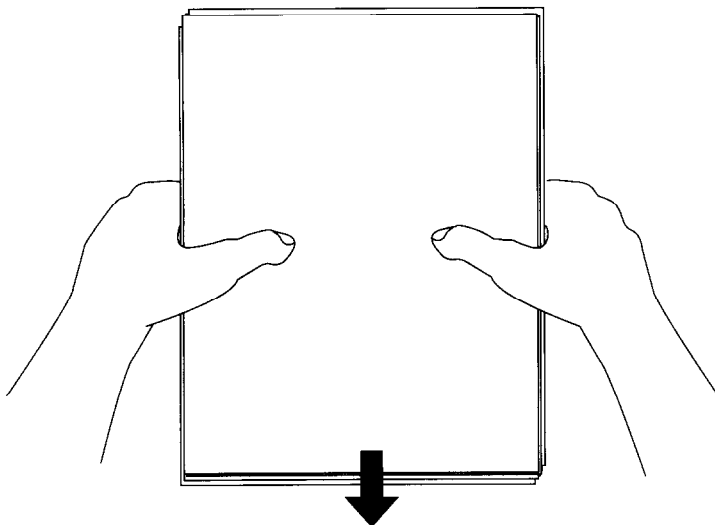
- Pick up your stack of paper.



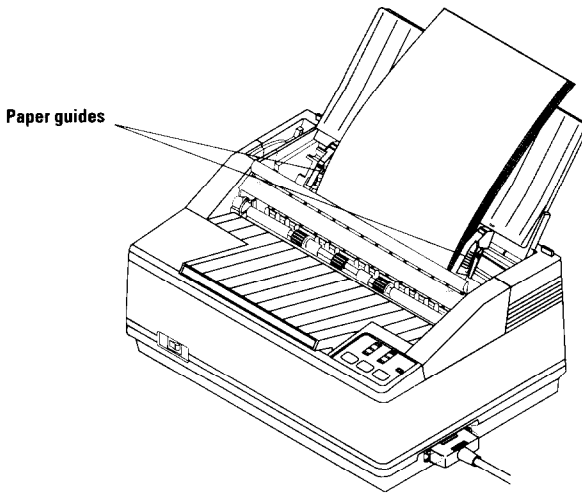
- Cut sheet paper can sometimes stick together, causing problems when the paper is drawn through the printer. To prevent this, flick through the stack of paper with your thumb. This helps ensure that each sheet of paper is loose within the stack and will be fed through the printer separately.



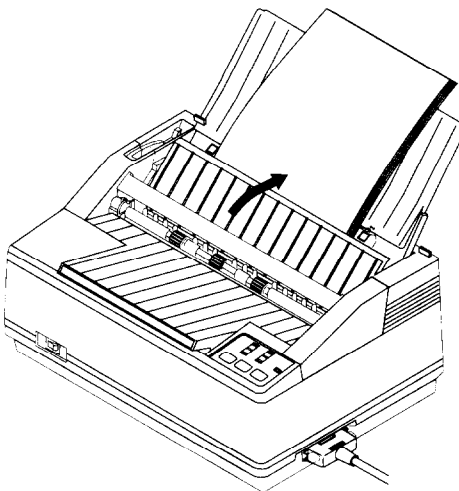
- Now make sure that all the sheets are properly lined up by tapping the end of the stack gently but firmly on a flat surface, such as a table-top.



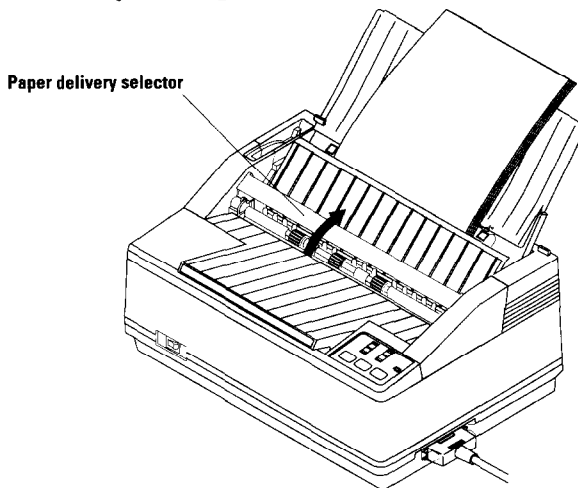
- Now place the paper in the paper tray.



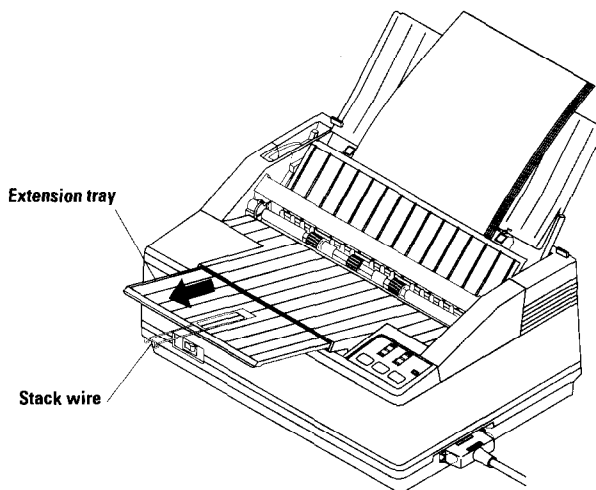
- Adjust the right-hand paper guide so that the paper stack fits snugly between the guides. The paper must be able to slide down freely into the printer, but should not be able to move from side to side.
- Push the paper tray cover closed.



- Push the paper delivery selector up and back. Printed pages will now be delivered in a stack, face down. When you turn the stack of printed pages right-side up, the sheets will be in the order in which they were printed.



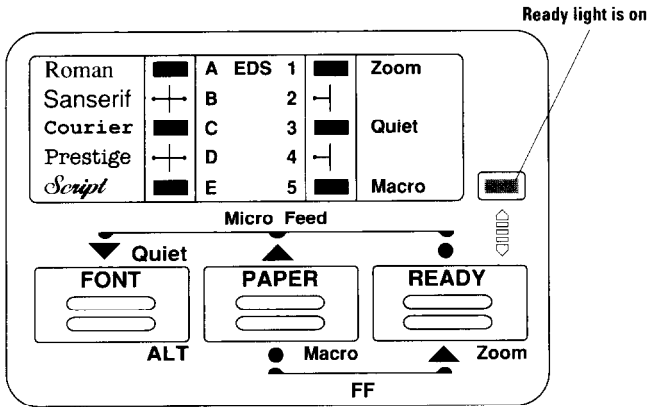
- Pull out the extension tray and pull out the stack wire to support the printed sheets.



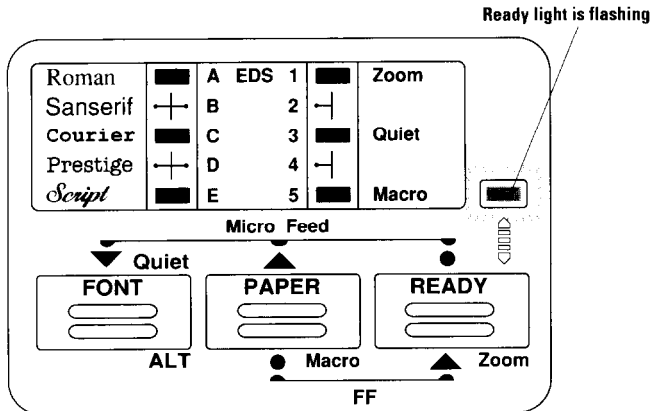
Ready mode and Not-Ready mode

The printer is in "ready" mode when it is ready to receive and print documents sent by the computer. When the printer is in "not-ready" mode, you can use the control panel keys to change various printer settings. In "not-ready" mode, the printer cannot print anything.

When the printer is on, the READY indicator light on the right-hand side of the panel indicates whether the printer is in ready mode, or not-ready mode. The light is on continuously if the printer is in ready mode. It flashes when the printer is not ready.



Ready mode

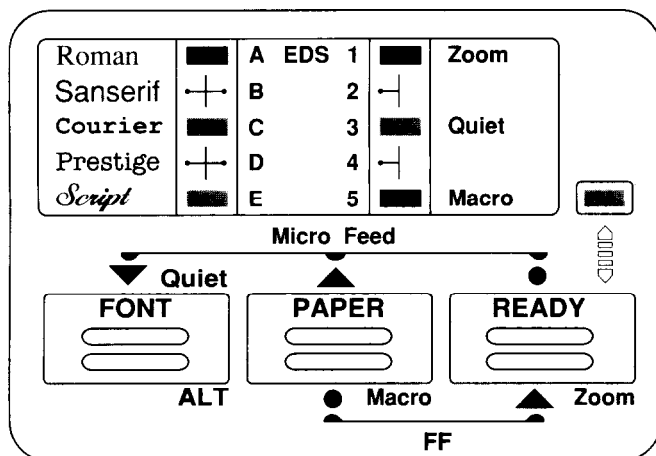


Not-ready mode

You can press the **READY** key to switch the printer between the two modes. Pressing **READY** once puts the printer in ready mode; pressing **READY** again puts the printer in not-ready mode.

Using the control panel

The control panel's purpose is to allow you to control the printer's various functions and to see at a glance the printer's set-up.



Windows users will have most settings, such as font selection and zoom resolution, determined by their computer, rather than the printer's control panel. If you try to make these settings using the control panel keys, it will have no effect.

MS-DOS users can use the control panel to change font and to take advantage of the printer's other features, such as the zoom and quiet printing modes.

There are three keys on the panel: **FONT**, **PAPER** and **READY**. Each key has a number of different functions. Sometimes they are used on their own, and sometimes they are pressed together. Chapter 4 provides a full description of the different control panel operations.

The green READY light on the right-hand side of the panel indicates whether the printer is in ready mode or not-ready mode, as already mentioned.

The other six lights are always either on or off.

The three lights on the left indicate the currently selected font. If you are printing from Windows, this setting has no effect. However, if you are using MS-DOS, this setting can determine which font is used for printing. The settings of these three lights (on or off) indicate the current font selection. This is explained in the next section.

The three lights in the right-hand column indicate whether the Zoom, Quiet mode and Macro (saved settings) features are currently in effect or not. The Zoom and Macro settings do not apply if you are using Windows.

The control panel can also be used to make Electronic DIP Switch (EDS) settings. These are the feature settings that come into effect automatically each time the printer is switched on. An explanation of how to make Electronic DIP Switch settings is given in Chapter 4, starting on page 37.

Printing out your documents

Printing documents is dependent on your operating system (Windows or MS-DOS).

In Windows

Unless you select otherwise in the application, Windows applications always print to the current Windows Default Printer. You have probably already made the LC24-30 Colour the Default Printer when you installed the printer driver file, (see page 15 of Chapter 2). If you did not, you can set it as follows:

- Double-click the *Control Panel* icon in the *Main* window.
- Double-click the *Printers* icon
- Make sure **LC24-30 Colour** is selected in the *Installed Printers* list.
- Click on *Set As Default Printer*.
- Click on *Close* to return to the *Control Panel* window.

To print from your application, select *Print* from the *File* menu. Make the desired on-screen selections, such as the number of copies, and click on OK.

In MS-DOS

To print from an MS-DOS application, you first need to select the printer you are going to use from within the application itself. The way in which you do this depends on the application. Refer to the application's manual. Typically, the program will feature an **INSTALL** or **SETUP** command that allows you to select from a list of possible printers.

Start up the application program and select a printer. Choose one of the following in the order of preference shown:

Star LC24-30 Colour
Star LC24-200 Colour
Star LC24-200
Epson LQ-860/1060
Epson LQ-860/1050

The shaded printers are not color printers. You will not be able to print in color, if you select one of them.

If none of the printers above is listed, choose one of the following, in order of preference:

IBM ProPrinter X24E/XL24E
IBM ProPrinter X24/XL24

These two printers are not color printers. You will not be able to print in color, if you select one of them.

Note: You cannot print in color unless you select the name of a printer which can print in color.

To print out your document, follow the instructions for printing given in the manual. Typically, you will select the application's PRINT command. Make any necessary selections, such as the number of copies, and press the RETURN key to start printing.

Note: MS-DOS applications select printers independently. You will need to select the printer in each application before printing.

Using different fonts

You can vary the appearance of your printed text by using different fonts. If you are unfamiliar with fonts (or typefaces), please refer to the section *Introduction to fonts* on page 50 of Chapter 4.

The way in which you select different fonts depends on whether your computer is running Windows or MS-DOS.

If you are using Windows, you will select fonts from your applications software, e.g. your word-processing program.

If you are using MS-DOS, you can either select fonts using the printer's control panel, or from your application.

In Windows

If you are running Windows, you will select fonts in your applications software. Your Windows system (version 3.1 or later) already includes several fonts, such as Arial, Times New Roman and Symbol. You can also take advantage of the fifteen TrueType fonts included on the floppy disk packaged with the printer. For instructions on how to install these fonts see page 52 of Chapter 4.

American Text	: 1234567890	ABCDE	abcde
Broadway	: 1234567890	ABCDE	abcde
Clotter Black	: 1234567890	ABCDE	abcde
Cooper Black	: 1234567890	ABCDE	abcde
Dem Casual	: 1234567890	ABCDE	abcde
Exotic 350 Demi-Bold	: 1234567890	ABCDE	abcde
Handel Gothic	: 1234567890	ABCDE	abcde
Hobo	: 1234567890	ABCDE	abcde
Humanist 521 Extra Bold	: 1234567890	ABCDE	abcde
<i>Kaufmann</i>	: 1234567890	<i>ABCDE</i>	<i>abcde</i>
P.T.Barnum	: 1234567890	ABCDE	abcde
Raleigh Demi Bold	: 1234567890	ABCDE	abcde
Shadow Black Condensed	: 1234567890	ABCDE	abcde
Seagull Heavy	: 1234567890	ABCDE	abcde
Windsor	: 1234567890	ABCDE	abcde

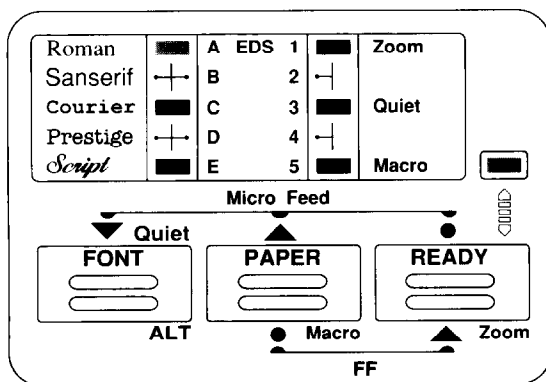
In MS-DOS

If you are using a computer running MS-DOS, you can use the control panel to select one of the 6 typeface families built into the printer.

Roman : 1234567890 ABCDE abcde
Sanserif : 1234567890 ABCDE abcde
Courier : 1234567890 ABCDE abcde
Prestige : 1234567890 ABCDE abcde
Script : 1234567890 ABCDE abcde
Draft : 1234567890 ABCDE abcde

The lights on the control panel's left column show the selected font. The lights come on and off as you press the **FONT** key.

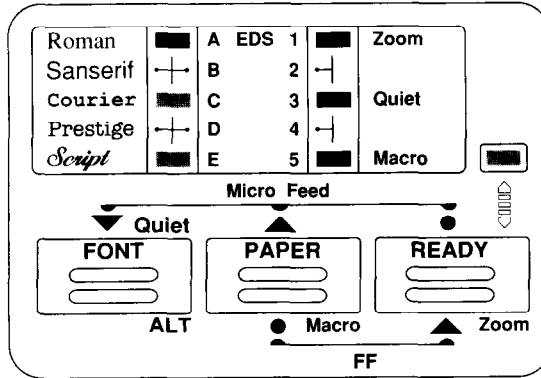
If a single light is on, the font next to that light is the selected font. For example, if only the top light is on, the Roman font is currently selected.



Roman typeface selected

Similarly, if only the middle light or bottom light is on, Courier or Script is selected.

If two lights are on, the font whose name is between the two lights is the selected font. For example, if the lower two lights are on, Prestige is the selected font.



Prestige typeface selected

Similarly, if the top two lights are on, Sanserif is selected.

If none of the lights is on, the draft font is selected.

To select a font for printing, use the following steps:

- First put the printer in not-ready mode by pressing the **READY** key.
- Keep pressing the **FONT** key until the lights show the desired font is selected.
- Press the **READY** key again to confirm your selection and put the printer back in ready mode.

To select fonts using your software application, consult the application's manual.

You can also prevent your software from making font selections, so that font selection is controlled completely from the control panel. This is described on page 54 of Chapter 4.

Using other printer features

There are a number of other printer features that you may want to use. These features include the ability to use different types of paper, the ability to adjust the position of the paper very accurately, and the zoom feature, which allows you to print documents at a reduced size. These are all described in Chapter 4, *Printer reference*.

Dealing with printing problems

The LC24-30 Colour is designed to be easy to use and trouble-free. However, from time to time, you may come up against difficulties while printing. If you have any problems, it will be helpful to refer to Chapter 6, *Troubleshooting*. Also, you may need to refer to your *MS-DOS User's Guide* or *Microsoft Windows User's Guide* and to your applications software manuals, as some printing problems are caused by incorrect software settings.

Chapter 4

Printer reference

Introduction

This chapter is intended as a comprehensive guide to the printer's functions. It covers a wide range of topics, some that have been briefly described in the first three chapters and some that are new.

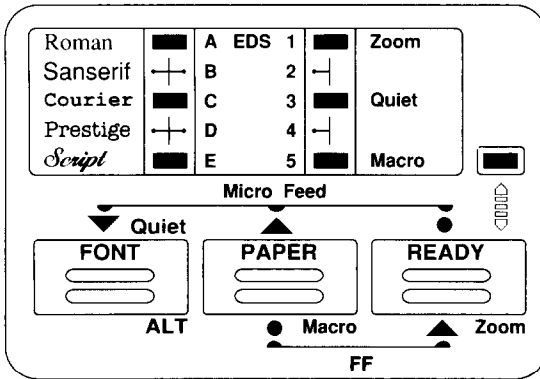
Among the topics covered are the following:

- Using the printer's control panel
- Making power-on default settings (Electronic DIP Switch settings)
- Selecting which emulation to use (Epson or IBM)
- Setting up the printer to work with your computer
- Using different fonts
- Using different types of paper
- Useful printer features
- Feeding paper through the printer
- Selecting Zoom resolution
- Using Quiet mode
- Saving current settings for future use (the Macro feature)
- Making necessary adjustments to the printer
- Performing print tests

Using the control panel

The control panel allows you to control the printer's various functions and to see the printer's current set-up.

The control panel has more significance for MS-DOS users, since Windows takes care of feature selections, such as font selection. MS-DOS users must use the printer's control panel to manage the printer's functions.



Control panel

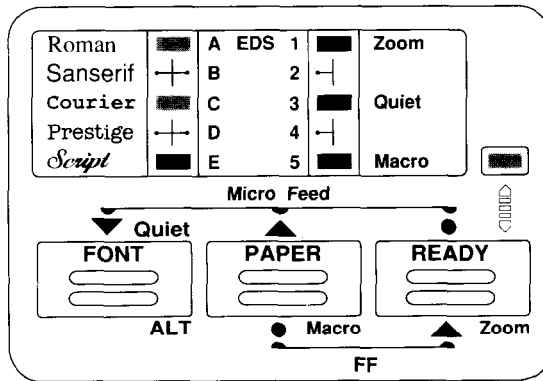
The panel has three keys: **FONT**, **PAPER** and **READY**. The keys are pressed to select and control printer functions. Sometimes keys are pressed on their own and sometimes they are pressed in combination. For example, pressing the **FONT** key on its own selects a font. Pressing the **READY** key while holding down the **PAPER** key feeds a sheet of paper through the printer.

The panel has seven green lights which give you information on feature selections.

When the printer is on, the green light on the right-hand side of the panel indicates whether the printer is in "ready" mode (ready to receive data from the computer), or "not-ready" mode (not ready to receive data). In "not-ready" mode you can make changes to printer settings,

such as the current font. The light is on when the printer is in ready mode. It flashes when it is in not-ready mode.

The three lights arranged in the left-hand column of the panel show which font is currently selected. If a single light is on, the font next to that light is the currently selected font. For example, if the top light only is on, Roman font is selected. Similarly, the middle and bottom lights on their own signify that Courier and Script respectively are selected. If two lights are on, the font whose name is between the two lights is the selected font. If the upper two lights are on, Sanserif is the selected font. If the lower two lights are on, Prestige is selected. If none of the three lights is on, Draft font is selected.



Sanserif is the selected font

To select a font from the control panel, put the printer in **not-ready mode**. Press the **FONT** key until the lights show the correct combination for the desired font. The combination of lit and unlit LEDs changes with each key press.

The three lights in the right-hand column indicate the status of the zoom, quiet mode and macro features. The lights are on if these features are in effect. Conversely,

the lights are off if these features are not in effect. These features are explained later on in this chapter.

The control panel is also used to make Electronic DIP Switch settings. These feature settings come into effect each time the printer is switched on.

See the following section for an explanation of how to make Electronic DIP Switch settings.

Note: If you are using Windows, most printer settings, such as Font and Zoom, will be determined by the software you are using. MS-DOS users, however, will use the control panel to set these functions.

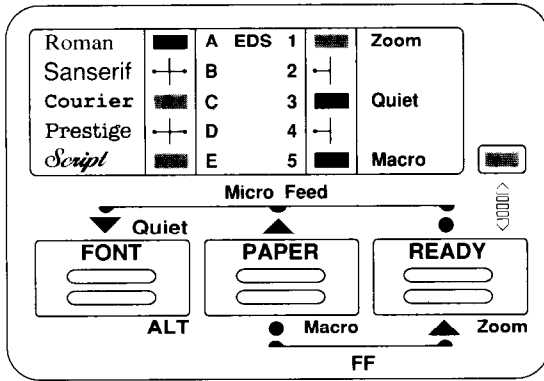
Making Electronic DIP Switch settings

Dot-matrix printers usually have rows of thin, two-position switches (DIP switches) with which you can select various power-on settings, such as emulation (Epson or IBM), default font and print quality (Letter-Quality or draft). The LC24-30 Colour does not have DIP switches. Instead you can use the control panel directly to select imaginary DIP switches and make power-on feature settings. These power-on settings are known as Electronic DIP Switch settings and are numbered A1 to E5. Switch settings are either ON or OFF.

Like the control panel, Electronic DIP Switch settings have more significance for MS-DOS users, since Windows ignores most of these settings.

Use the control panel to make the settings you want. First, switch the printer off. Then, switch it on again while holding down all three control panel keys. The printer comes on in Electronic DIP Switch (EDS) mode and beeps once. The **FONT** and **PAPER** keys can now be used to select a letter between A and E, and a number between 1 and 5 respectively.

The three lights on the left indicate the current letter selection. The three lights on the right indicate the number selection. If a single light is on, the letter or number next to that light is the one that is currently selected. If two lights are on, the letter or number between the two lights is the one that is currently selected. For example, if the lower two left-hand lights and the top right-hand light are on, the D1 setting (print quality mode) is selected.



Electronic DIP Switch D1 (print quality) selected

Press the **FONT** and **PAPER** keys until the letter and number corresponding to the desired setting are shown. The READY light shows the current switch setting: ON or OFF.

Use the **READY** key to change the setting.

For example, to set the print quality setting to Draft, select D (press the **FONT** key until the lower two lights in the left-hand column are on) and 1 (press the **PAPER** key until the top light in the right-hand column is on). Press the **READY** key to turn the READY light off.

You can print out the current Electronic DIP Switch settings by holding down the **FONT** key and pressing the **READY** key.

When you have made all the desired Electronic DIP Switch settings, hold down the **FONT** key and press the **PAPER** key to save the new settings and exit Electronic DIP Switch mode.

Your newly selected settings will automatically come into effect each time the printer is switched on, unless you decide to change the Electronic DIP Switch settings in the future.

When the printer is shipped from the factory, all switch settings are set to ON, except for B1, the graphics direction, which is set to OFF (uni-directional printing).

The full list of Electronic DIP switch settings is as follows:

EDS setting	Function	ON	OFF
A1	Emulation	Standard/Epson	IBM
A2	AEC (Automatic Emulation Change) Mode	Enabled	Disabled
A3	RAM usage	Input buffer	Download buffer
A4	Color and Zoom	Enabled	Disabled
A5	Auto LF with CR	Disabled	Enabled
B1	Graphics direction	Bi-directional	Uni-directional
B2	Paper-out	Enabled	Disabled
B3	Ink Ribbon Type	Color	Monochrome
B4	Reserved	Leave ON	
B5	Time-out printing	Enabled	Disabled
C1	Page length	See below	
C2			
C3			
C4	Print pitch	See below	
C5			
D1	Print mode	LQ	Draft
D2	Character table Standard mode IBM mode	Graphics Set #2	Italics Set #1
D3	IBM code page or International character set	See below	
D4			
D5			

EDS setting	Function	ON	OFF
E1	LQ font selection		See below
E2			
E3			
E4	Reserved		
E5	Reserved		

A1 - Emulation

The LC24-30 Colour can “emulate” either an Epson LQ-860 or an IBM Proprinter X24E. To “emulate” means to “perform in the same way as”. The two printers offer different sets of printable characters. Unless you are using an MS-DOS system and specifically need the IBM character sets, you will probably use the printer in Epson mode. The character sets used by both the Epson and IBM emulations are listed in the Appendix starting on page 153.

If you want to use the printer in IBM emulation mode, you will also need to select an IBM printer driver (see page 27 of Chapter 3).

A2 - Automatic Emulation Change (AEC) mode

If this function is ON, the printer will automatically select the correct emulation mode (Epson or IBM) according to the printer driver selected in your application. For example, if the printer is in Epson mode and you select an IBM printer from your word-processor running in MS-DOS, the printer will automatically switch over to IBM emulation mode. This will allow you to print characters from the IBM character sets.

A3 - RAM usage

If A3 is OFF, the printer is able to store patterns representing characters that you have defined with the Epson or IBM printer commands (see Chapter 7). If A3 is ON, the printer can store the data it receives from the computer. This speeds up the printing process. However, it cannot store user-defined character patterns.

A4 - Color and zoom

If A4 is ON, you can print in color and use the zoom feature. If it is OFF, these features are unavailable. If you change this setting after saving settings using the macro function (see page 62), the current Zoom setting will be cancelled.

A5 - Auto line feed

If A5 is ON, your computer needs to send both a line feed code and a carriage return code at the end of each line. Most applications will do this automatically. If A5 is set to OFF, the printer will automatically perform a line feed each time it receives a carriage return. As a result, your software only needs to send a carriage return at the end of a line.

If your output is double-spaced when it should not be, you may need to set this setting to ON.

If a line of your output is printed on top of another line, you should set this setting to OFF.

B1 - Graphics direction

When the printer prints graphics rather than text, it can either print bi-directionally (the print head prints as it moves from left to right and again as it returns from right to left), or uni-directionally (the head prints from left to right only). Bi-directional printing is faster, while uni-directional printing may give higher-quality output. If B1 is ON, bi-directional printing is selected. If B1 is OFF (the default setting), uni-directional printing is selected.

B2 - Paper out

If B2 is ON, the printer can detect when there is no more paper and will stop printing. If B2 is OFF, the printer can print right down to the bottom of the page. However, there is also the danger that it may print past the end of the paper, which may cause damage to the print head and platen.

B3 - Ink ribbon type

If B3 is ON, you can use either a color or a monochrome ribbon. If B3 is OFF, you should only use a monochrome ribbon. You can use a monochrome ribbon with B3 ON, however, its life will be shorter. If you try to use a color ribbon with B3 OFF, colors will be printed in unexpected ways.

B4 - Reserved

This switch should be left ON.

B5 - Time-out printing

If B5 is ON, the printer prints data as soon as it is received from the computer. If B5 is OFF, the printer accumulates data in its buffer and prints out pages at regular intervals.

C1 to C3 - Page length

If you are using 11" sheets, these three switches should be ON. The settings appropriate to various page sizes are shown in the table.

Page length	C1	C2	C3	Page length	C1	C2	C3
11"/Letter	ON	ON	ON	8.5"/Letter	ON	ON	OFF
8"	OFF	ON	ON	14"/Legal	OFF	ON	OFF
11.7"/A4	ON	OFF	ON	10.5"/Executive	ON	OFF	OFF
12"	OFF	OFF	ON	7.25"/Executive	OFF	OFF	OFF

C4 and C5 - Print pitch

Pitch is the number of characters in a one-inch line of text. If you want to print using 10 characters per inch text, C4 and C5 should be set to ON. The settings for other pitches are as shown in the table.

Print pitch	C4	C5
10 CPI	ON	ON
12 CPI	ON	OFF
15 CPI	OFF	ON
17 CPI	OFF	OFF

D1 - Print quality

If D1 is ON, text is printed in Letter Quality mode. If it is OFF, Draft quality text is printed. Letter Quality allows you a choice of different fonts. Draft text is less attractive, but can be printed faster than Letter Quality text.

D2 - Character table

The D2 setting selects which characters can be printed. Selectable characters are grouped into sets known as character tables. The character table selected depends on the current emulation (switch A1).

Emulation	ON	OFF
Standard (Epson)	Graphic character set	Italic character set
IBM	IBM character set #2	IBM character set #1

These character tables are listed in the Appendix starting on page 153.

D3 to D5 - IBM code page or international character set.

Various special characters (for example, accented characters) are needed for different languages. For this reason, you can select variations on the standard character tables. These are known as code pages or international character sets.

If the printer is in IBM emulation mode (A1 is OFF), or if it is in Epson emulation mode (A1 is ON), and the Epson graphic character set is selected (D2 is ON), settings D3 to D5 select a code page as shown in the following table:

Code page	D3	D4	D5
#437 U.S.A.	ON	ON	ON
#850 Multi-lingual	OFF	ON	ON
#860 Portuguese	ON	OFF	ON
#861 Icelandic	OFF	OFF	ON
#863 Canadian French	ON	ON	OFF
#865 Nordic	OFF	ON	OFF

If the printer is in Epson emulation mode (A1 is ON) and the Italic character set is selected (D2 is OFF), settings D3 to D5 select a character set as shown in the following table:

Country	D3	D4	D5
U.S.A.	ON	ON	ON
France	OFF	ON	ON
Germany	ON	OFF	ON
England	OFF	OFF	ON
Denmark I	ON	ON	OFF
Sweden	OFF	ON	OFF
Italy	ON	OFF	OFF
Spain I	OFF	OFF	OFF

These code pages and character set variations are listed in the Appendix starting on page 153.

E1 to E3 - LQ font selection

If Letter Quality print mode is selected (D1 is set to ON), any of the following five fonts may be selected as the default font - the font that is current when the printer is powered on. Settings E1 to E3 select a font as shown in the table:

Font	E1	E2	E3
Roman	ON	ON	ON
Sanserif	OFF	ON	ON
Courier	ON	OFF	ON
Prestige	OFF	OFF	ON
Script	ON	ON	OFF

If you change the font setting after saving settings using the macro function (see page 62), the new font setting will replace the original font in the macro settings.

E4 and E5 - Reserved

These are both reserved.

Selecting which emulation to use

The LC24-30 Colour can emulate both Epson and IBM dot-matrix printers. This means that the software applications you use on your computer can treat the printer as if it were an Epson or an IBM printer.

As a result, when you select a printer in your software application, you can select certain types of Epson or IBM printer instead of a Star printer. This can be useful if, for example, you are using an MS-DOS application that does not list any Star printers in its list of supported printers.

You will probably never need to worry about changing the emulation mode. The LC24-30 Colour can automatically sense which emulation is required and switch modes accordingly (provided that Electronic DIP Switch setting A2 is ON).

However, you may wish to set the emulation mode to IBM. This could be done in case the Automatic Emulation Change setting is ever turned off, or if you know that the printer will always be used in IBM mode.

When you first take delivery of the printer, it will be set to Epson emulation mode.

To change the emulation setting to IBM mode, use the following steps:

- Switch the printer off, then switch it on again while holding down all three control panel keys. Switch A1, the emulation mode setting, is selected. If Epson emulation mode is the current setting, the READY light will be ON.
- Press the **READY** key once to change the setting to IBM mode. The READY light will go OFF indicating that IBM emulation mode is now the current setting.
- Hold down the **FONT** key and press the **PAPER** key to save the new setting and exit Electronic DIP Switch mode.

To change the setting back to Epson mode, simply perform the reverse procedure.

From now on the printer will turn on in the mode you have selected.

Connecting the printer to your computer

There are two stages to connecting the printer and your computer. First you must physically connect them with a cable. Secondly, you must set up your software to print to the printer.

Choosing which type of cable to use

Before connecting your printer to the computer, make sure that both are turned off.

A cable is not supplied from Star with this printer. There are two types of cable that you can use: a standard 36-pin Centronics parallel cable or the serial-to-parallel convertor cable that you can purchase as an option with the LC24-30 Colour.

Connecting the printer to a computer using a parallel cable is generally simpler. However, the length of the parallel cable should not be more than 6' (2m). Otherwise, the transfer of information between your computer and the printer may not work properly. A serial connection can be as long as you like, but it is a little more complicated to set up.

To summarize, it is best to use a parallel cable unless either you need to have your printer located more than 6' (2m) from your computer, or you have another device connected to your computer's parallel port.

Buy the type of cable which will best suit your needs.

Setting up the printer with a Windows computer

To use the printer with Windows, you need to install the printer driver, which is supplied on floppy disk, into your computer. This installation procedure is described on page 15 of Chapter 2.

If you are using the serial-to-parallel converter, you will need to make some switch settings on the converter and corresponding serial port settings in Windows. This is described in the section *Serial-to-parallel interface converter* in Chapter 6.

You should now be able to print from your Windows applications. Try printing a document from an application, following the steps outlined on page 27 of Chapter 3. If you have problems printing, refer to Chapter 6, *Troubleshooting*.

Note: Unless you choose a different printer from within the application, Windows applications always print to the currently selected default printer.

Setting up the printer with an MS-DOS computer

IBM PC's and compatibles running MS-DOS should print automatically to a printer connected to the parallel port. However, you must first select a printer from your application program.

If you are using the serial-to-parallel converter, you will need to enter some set-up statements into a file on your computer named AUTOEXEC.BAT. See page 88 of Chapter 5 for details.

If you are using a parallel cable, you will probably not need to make any changes to AUTOEXEC.BAT

To check that your printer and computer are correctly connected, try printing out some text using the MS-DOS print command. To do this, type "**PRINT**" followed by a "space" and then the name of a text file. Then press the *Enter* or *Return* key. Press *Enter* or *Return* again in response to the prompt "**Name of list device [PRN]:**".

The printer should now print out the text file.

When you can print using the MS-DOS print command, try printing from an application.

Start up an application program, such as your word-processor, and select a printer to print to, as described on page 27 of Chapter 3 (you may also need to consult the application's manual).

Now try printing a document from your application.

If you have problems printing either with the PRINT command or from your application, refer to Chapter 6, *Troubleshooting*.

Note: Unlike Windows applications, DOS application programs select printers individually. You will have to select the printer in each application before you can print a file from it.

Setting up the printer with a Macintosh

You can connect the printer to a Macintosh using special commercially available kits, such as Orange Micro Inc's Grappler, which include all necessary equipment and software.

Buy the Serial RS-422 to Centronics Parallel converter version of the Grappler, or a comparable product, and follow the accompanying installation instructions.

Using a Macintosh also allows you to print using TrueType and Adobe PostScript type 1 fonts. To use PostScript fonts you will also need to install Adobe Type Manager on your Macintosh.

Using fonts and varying the appearance of text

Introduction to fonts and typefaces

A font is a collection of characters (letters, digits and punctuation symbols) of a particular design and size. The typeface of a font is the design style of the characters. The typeface lends a font its distinctive appearance. There are hundreds of different typefaces in existence. Commonly-used typefaces include Times, Palatino, Helvetica, Univers and Courier. Some examples of different typefaces are shown below.

Courier

Palatino

Bookman

Univers

Helvetica

Script

Some typefaces, for example Times and Palatino, have small curly hooks on the ends of the lines that form the characters. These hooks are known as *serifs* and make body text more readable by leading the eye on from one letter to the next. Other typefaces, for example Univers and Helvetica, do not have these hooks and are referred to as *sans serif* (without *serif*) typefaces. Characters in these typefaces stand out on their own. Generally fonts with *serif* typefaces are used for body text and *sans serif* typefaces are used for headings and captions

Fonts are either monospaced (fixed) or proportionally-spaced. Font spacing is inherent in the typeface. Of the typefaces shown above, Courier is monospaced, and the rest are proportionally-spaced.

The characters in a monospaced font all have equal width and occupy an equal amount of space on a line. The characters of a proportionally-spaced font take up varying amounts of space depending on each individual

character's design. As a result, two different sentences that contain the same number of characters will occupy the same width if printed using a monospaced font, but will usually have different widths if a proportionally-spaced font is used.

An example sentence in Courier.

Identical number of characters.

An example sentence in Bookman.

Identical number of characters.

Pitch

The pitch of a monospaced font is the number of characters printed per inch. Proportionally-spaced fonts do not have a consistent pitch value, since different characters have different widths.

Weight

Font weight is the thickness of the lines which make up the font's characters. The standard weight is known as medium. Bold fonts, with thicker lines, are commonly used. Bold text is often used for emphasis or for headings. Light stroke weight fonts have lines that are narrower than the standard weight. Some examples of different stroke weights are shown below.

Light

Medium

Bold

Black

Bitmap fonts

Each character in a bitmap font is defined as a matrix of dots that the printer prints on the page. As a result, bitmap fonts are available in particular point sizes only. For example, the printer's built-in fonts are all bit-mapped, and may only be printed out at certain fixed sizes.

Scalable fonts

Each character in a scalable font is defined as an outline shape. The computer converts the outline shape to a matrix of dots that forms the printed character. Hence, scalable fonts, such as the TrueType fonts on the floppy disk accompanying the printer, can be displayed on-screen and printed at any size.

In Windows

Installing TrueType fonts

To install the TrueType fonts that are on the floppy disk accompanying this printer, follow the procedure below.

- Double click the *Control Panel* in Windows.
- Double click on *Fonts*. The *Fonts* dialog box appears.
- Click *Add*. The *Add Fonts* dialog box appears.
- Insert the disk in your computer's floppy disk drive.
- Select the drive by letter (this is usually "A:", sometimes "B:"). The names of the fonts stored on the disk are displayed in the *List of Fonts* window. Each font name is followed by the word "TrueType"
- Select the fonts you wish to install. If you want to install all of them, click *SelectAll*.
- Click *OK*. The *Fonts* dialog box reappears and installation is carried out. The names of the newly installed fonts are automatically added to the *Installed Fonts* list.
- Within your application program, select *Printer Setup* from the application's *File* menu, and reselect the printer. The application can now display text on-screen and print text on your printer using the new fonts.

Note: The TrueType fonts that are supplied can only be used on IBM PC compatible computers running Windows 3.1 or higher.

Selecting different fonts

If you are running applications software under Windows, you will select fonts from within your application (refer to your application's manual for details).

Your applications software manual will tell you the various ways in which you can type-set your text on-screen so that it is ready to print out on the printer.

Your Windows system already includes several fonts, such as Arial, Times New Roman and Symbol. You can also use the 15 TrueType fonts included with the printer. If you have installed Adobe Type Manager software on your computer, you can also display and print Adobe PostScript fonts.

In MS-DOS

Selecting different fonts

If you are running applications software under MS-DOS, you can either use the printer's control panel to select the printer's built-in fonts, as described on page 30 of Chapter 3, or use your application to select fonts installed on your computer (refer to your application's manual for details). You can also set up the printer to ignore font selections made by your applications software, so that font selections can only be made from the control panel. This is described on page 54.

Changing the character pitch

Changing the font pitch allows you to condense text into a smaller area. It also enables you to vary the appearance of text in a single font.

The character pitch of printed text is determined by the current Electronic DIP Switch print pitch setting (see page 43).

There are four pitch settings available: 10, 12, 15 and 17 characters per inch.

Unless you have altered the setting, the pitch is set to 10 characters per inch.

You can also select character pitch from software applications programs. Consult the application's manual for details.

Preventing software font selection

To prevent the font selection from being altered by a software application and to ensure that selections can be made from the control panel only, power up the printer while holding down the **(FONT)** key. The printer will sound a very short beep as it comes on.

Now you can put the printer in **not-ready mode** and select a font. Put the printer back in **ready mode** again, and begin printing. From now on, the font selection will not be affected by any commands received from your computer.

To enable software font selection again, turn the printer off and on again.

Using different types of paper

You can use any of the following types of paper with your LC24-30 Colour printer: single sheets, fanfold paper and multi-part forms.

Single sheets are individual, unconnected pieces of paper. They are also referred to as cut sheets. Up to fifty-five single sheets can be stacked in the paper tray and fed automatically into the printer.

You can load single sheets into the printer in either portrait (upright) or landscape (widthwise) orientation, provided that the width of the paper does not exceed 11".

See Chapter 3 for a description of how to load single sheet paper.

Fanfold forms are sheets of paper joined with perforations. Fanfold forms usually have a column of holes punched into each edge which enables the printer to grip the paper as it is fed through. Fanfold paper is also sometimes referred to as computer paper, continuous forms or sprocket forms. If you want to use fanfold paper, you will need to install the optional push tractor unit (PT-10Q). Installation of the push tractor unit is described on page 72 of Chapter 5.

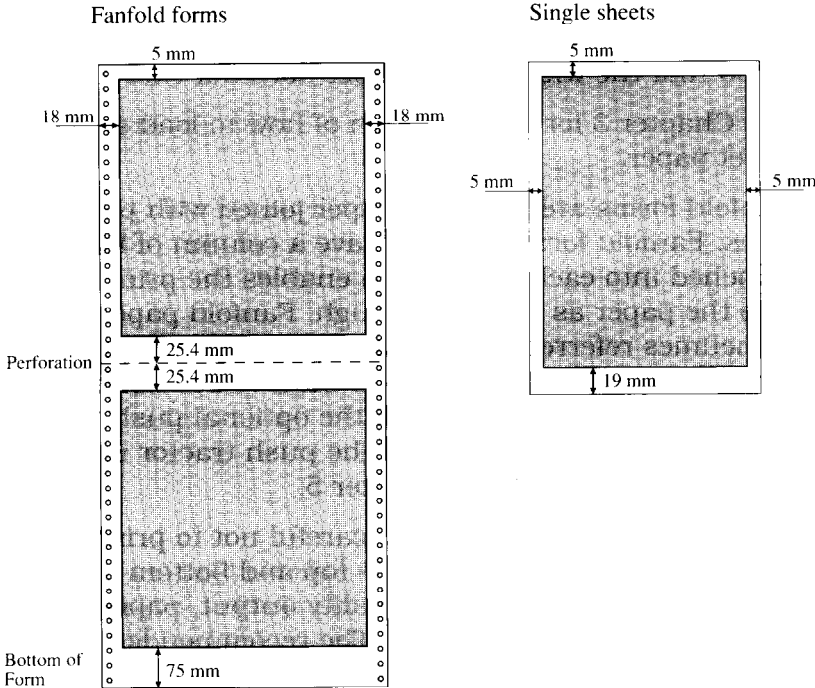
When using fanfold paper, be careful not to print too close to the perforations at the top and bottom of each sheet. This can cause poor quality output, paper misalignment or paper jamming. The recommended printable areas for fanfold paper and for cut sheets are shown in the diagram on the next page.

See Chapter 5 for a description of how to load and use fanfold paper.

Multi-part forms consist of several sheets, one on top of another, enabling several copies to be made simultaneously. Multi-part forms may be joined together, as fanfold stationery. If you want to use multi-part forms, use the type that has both side edges glued together. Do not use forms that have more than three parts.

You can also print using sheets of labels. We recommend that single sheet labels are used in preference to fanfold label paper.

Note: Do not reverse feed label sheets.



Printable areas for single sheet and fanfold paper

Useful printing features

Portrait and landscape printing

You can load paper into the printer in either portrait (upright) or landscape (widthwise) orientation, provided that the width of the paper does not exceed 11". Hence, you can load Letter-sized paper in landscape orientation, but not A4 paper.

Note: Although Letter-sized paper can be loaded into the printer in either landscape or portrait orientation, the print width is limited to 8" (20.3cm).

If you are using Windows, you can choose between Portrait and Landscape orientation using your application's *Printer Setup* menu option.

Face-up and face-down printing

You can choose whether single-sheet printed output will be delivered face-up (only one page) or face-down (in sequential order). To do this, simply adjust the position of the paper delivery selector.

Push the paper delivery selector towards the back of the printer to select face-down printing. Pull it forward to select face-up printing.

Manual by-pass

If one type of paper is loaded in the paper tray, but you wish to print on a single sheet of paper of a different type (for example, a sheet of letter head paper), you can do so without unloading the paper already in the tray.

Insert the new sheet of paper into the printer in front of the tray cover and press the **PAPER** key. The printer automatically feeds in the new sheet, ready for printing.

Note: If you are using letter head paper, you will need to put the sheet into the tray face down and upside down.

Pausing printing

To temporarily interrupt printing, press the **READY** key. This puts the printer in **not-ready mode**. This allows you to check your print-out or change a setting using the control panel. To resume printing, press the **READY** key again to put the printer back in **ready mode**.

Parking fanfold paper

If you are using fanfold paper and want to switch to single sheets temporarily, you can do so without removing the fanfold paper. This is known as “parking” the fanfold paper. When you are ready to resume using the fanfold paper, you can “unpark” it again.

These operations are described on page 81 of Chapter 5.

The tear-off function

If you are using fanfold paper, you can remove printed output without disturbing the current position of the paper.

This operation is described on page 82 of Chapter 5.

Controlling the paper position

There are a number of ways in which you can adjust the position of the paper in the printer. You can feed paper through a line at a time (paper feed), eject the current page (form feed) and feed the paper forwards and backwards in very small steps (forward and reverse micro feed). You can also adjust the top-of-form position (the position at which printing starts on each new page). You can set separate top-of-form positions for single sheets and fanfold paper.

Paper feed

To feed the paper through the printer a line at a time, put the printer in **not-ready mode** by pressing the **READY** key. Then, press the **PAPER** key.

Form feed

A form feed operation feeds paper through the printer so that the print head is positioned ready to resume printing at the top-of-form position on the next page. If you are using single sheets of paper, this operation will simply eject the current page. If you are using continuous fanfold paper, the paper is fed through so that printing can continue from the top of the next sheet.

To perform a form feed operation, put the printer in **not-ready mode** by pressing the **READY** key, and then hold down the **PAPER** key. The printer will start feeding the paper through one line at a time. Keep holding the **PAPER** key down and press the **READY** key again, then release both keys at the same time. The printer now performs a form feed.

Forward micro feed

To feed the paper through the printer in small steps, first put the printer in **not-ready mode**. Hold down the **READY** key and press the **PAPER** key. Each time you press the **PAPER** key, the paper is advanced by a small amount.

Reverse micro feed

To feed the paper through the printer in reverse in small steps, first put the printer in **not-ready mode**. Hold down the **READY** key and press the **FONT** key. Each time you press the **FONT** key, the paper is fed backwards by a small amount.

Setting the auto load position

Each time the printer feeds in a sheet of paper, it always starts printing at the same distance from the top of the page. This is referred to as the auto load position. If you want to change this setting, you can do so as follows.

- Load one or more sheets of paper into the tray.
- Press the **PAPER** key twice to feed in the top sheet of paper ready for printing.

Note: You can only alter this setting immediately after loading paper. If you feed the top sheet further through the printer by pressing the **PAPER** key more than once, a new auto load setting cannot be saved.

- Put the printer in **not-ready mode**.
- Hold down the **READY** key and adjust the position of the paper by pressing either the **PAPER** key (to advance the paper) or the **FONT** key (to wind the paper back in small steps).
- When you have positioned the paper as you want it, press the **READY** key to save the setting.

This setting will remain in effect until you change it again or until you turn off the printer.

Note: You can also save the current auto load setting so that it is retained even when the printer is switched off and on again. See *Saving current settings* on page 62.

Selecting Zoom mode print size

You can print at either 50% (half) or 67% (two-thirds) normal size by using the Zoom mode. This is useful for printing wide documents, such as spreadsheets, on a single sheet.

Change the zoom size as follows. Put the printer in **not-ready mode**. Hold down the **(FONT)** key and press the **(PAPER)** key to cycle through the three zoom settings. The zoom light indicates the current selection as shown in the table below.

Zoom	Zoom light
50%	On
67%	Flashing
100%	Off

Press the **(READY)** key to confirm your selection and put the printer back in **ready mode**.

The printer beeps once to indicate that 50% zoom has been selected, twice for 67%, or sounds a very short beep to indicate that Zoom mode has been cancelled; that is, 100% has been selected.

You can disable the Zoom feature by setting Electronic DIP Switch setting A4 to OFF (see page 41).

Note: This setting has no effect if you are printing from a computer running Windows

Selecting Quiet mode

To reduce the level of noise generated by the printer during operation, you can put the printer into Quiet mode. To do this, put the printer in **ready mode** and press the **(FONT)** key. The printer will beep once and the

Quiet indicator will light up, indicating that the printer is in Quiet mode. Printing will be slightly slower.

To turn off Quiet mode, press the **FONT** key again while the printer is in **ready mode**. The printer will beep again to indicate that you have quit Quiet mode.

Saving current settings (the Macro feature)

You can save the following settings for future use: font, quiet, zoom resolution, auto load position for single sheets, and auto load position for fanfold forms (for a description of how to set the auto load position, refer to page 60).

Put the printer in **not-ready mode**, hold down the **FONT** key, then press and hold down the **PAPER** key. Wait until the printer beeps twice and then release both keys. The current settings are saved and the Macro indicator lights up to indicate that the settings have been saved.

From now on, each time you switch on the printer, the saved settings will come into effect.

Note: If you wait too long before releasing the keys, the printer will beep three times. The settings will not be saved and the indicator will go off.

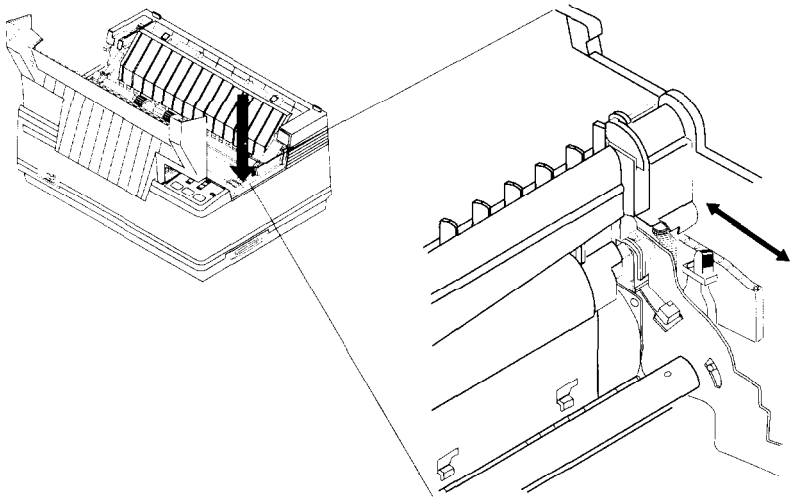
Note: This setting has no effect if you are printing from a computer running Windows

Making adjustments to the printer

Setting the print gap

Paper comes in different weights, normally quoted in gsm (grams per square meter). 60 gsm and 90 gsm are typical figures. Heavier paper is thicker. Multi-part forms are generally thicker than single sheets or ordinary fanfold paper.

The distance between the print head and the platen can be adjusted to suit the current paper thickness. The adjustment lever is located inside the printer's main body, at the right-hand side of the platen. There are five settings. Push the lever up to narrow the gap between the print head and the platen, and downwards to widen the gap. The top position is referred to as position 1, and the lowest position as position 5. Position 2, which is marked with a black dot, is the one most suited to single sheets.



It is a good idea to try out different settings in order to find out which setting gives the best print quality results.

The table below gives recommended settings:

Paper type	Weight of each sheet	Total thickness	Position
Single	14-24 lbs (52-90 gsm)	0.07-0.12 mm	2 or 3
2-ply	11-14 lbs (40-52 gsm)	0.12-0.14 mm	3
3-ply	11-14 lbs (40-52 gsm)	0.18-0.21 mm	4

Note: Persistent use of the wrong setting may drastically reduce the print head life.

Adjusting vertical alignment

Note: You may never have to use this function. Use it only if graphics print-outs appear strange (as in the illustrations below).

After you have been using your printer for some time, you may find that when you print graphics, the printed dots are slightly out of line with each other. For example, what you intend to look like this:



may come out like this:



or like this:



This is due to the mechanical parts of the printer working slightly out of alignment. It happens very rarely and you may never meet this problem. However, if it does occur, you can cure it as follows:

- Turn the printer off and make sure that it is loaded with paper (cut sheet or fanfold).
- Hold down both the **PAPER** and the **READY** keys.
- Turn on the printer. The printer will beep once.
- After a second or two, release both keys.

The printer will then print something like

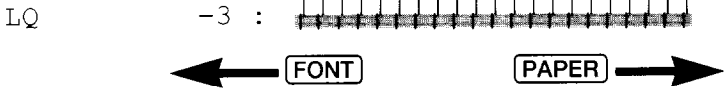
*** DOT ADJUSTMENT SETTING ***

LQ -3 : | | | | | | | | | | | | | | | | | | | | | |

(The number before the vertical bars may not be “-3”). After printing the bars, the printer will feed the paper so that you can see the print-out clearly.

Each vertical bar is actually two bars. You can use the **FONT** key to move the bottom row of bars to the left, and the **PAPER** key to move them to the right.

*** DOT ADJUSTMENT SETTING ***

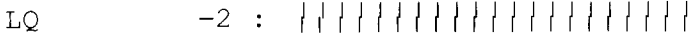


Each time you press either of these two keys, the printer prints a new test line and a new offset value.

If you are using fanfold paper, the printer will reverse feed the paper before printing the test pattern again. After printing the pattern, the printer will feed the fanfold paper back up again so that you can see it clearly.

In the illustration above, you would want to move the bottom row to the right; pressing the **PAPER** key would give you the following print-out:

*** DOT ADJUSTMENT SETTING ***



- The bars are better aligned now. Keep using the **PAPER** key until the two rows are aligned.
- You have now aligned the printer in Letter Quality (LQ) mode. By pressing the **READY** key, you can now correct the dot alignment of draft mode.

There are five modes in which the dot alignment may need to be corrected: LQ, DRAFT, DRAFT COND (condensed), GRAPHICS A and GRAPHICS B. Each mode must be adjusted separately. Cycle through these modes by pressing the **READY** key ("cycling" means that if you are in the last mode, GRAPHICS B, and you press the **READY** key, the printer will go back to LQ mode). The different modes may have different alignments because of the way in which the printer's electronics drive the moving parts.

- When you have adjusted all the dot alignments, hold down the **READY** key and press the **PAPER** key. The printer will print "*** END ***", eject the current page and go into **ready** mode.

Testing the printer

Short test

A short test prints out the version number of the software contained in the printer's ROM, followed by seven lines of text. Each line is offset by one character from the line above. If the color ribbon is in use, each line will be printed in a different color.

To perform a short test, power up the printer while holding down the **READY** key. The test print out should appear as shown below.

```
*** Ver 1.0 ***  
! "#$%&'()*+,-./0123456789:;<=>?@ACBDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefgijklmno  
!"#$%&'()*+,-./0123456789:;<=>?@ACBDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefgijklmnop  
!"#$%&'()*+,-./0123456789:;<=>?@ACBDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefgijklmnopq  
#$%&'()*+,-./0123456789:;<=>?@ACBDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefgijklmnopqr  
$%&'()*+,-./0123456789:;<=>?@ACBDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefgijklmnopqrs  
%&'()*+,-./0123456789:;<=>?@ACBDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefgijklmnopqrst  
&'()*+,-./0123456789:;<=>?@ACBDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefgijklmnopqrstu
```

Note: This test prints across the entire width of the carriage. It is a good idea to make sure that the printer is loaded with the widest possible paper available to avoid the possibility of damage to the print head or the platen.

Long test

A long test prints out the version number of the software in the printer's ROM, followed by the current Electronic DIP Switch settings, the current vertical alignment adjustment settings and the complete character set in each available font and pitch setting. The printer prints this sequence repeatedly until powered off.

To perform a long test, power up the printer while holding down the **PAPER** key.

This test prints across the entire width of the carriage. It is a good idea to make sure that the printer is loaded with the widest possible paper available to avoid the possibility of damage to the print head or the platen.

This test can generate many lines of text and graphics, so it is a good idea to use continuous fanfold paper rather than single sheets. The test continues indefinitely until the printer is turned off.

Printing out a hexadecimal dump

If you are writing your own programs to send output to the printer, it is sometimes useful to print out the raw data that the printer is receiving.

When you perform a hexadecimal dump, all codes (character codes and control codes) are printed out in hexadecimal format. The printer does not execute any of the normally executable codes it receives (such as OA - line feed). It simply prints them out.

Perform a hexadecimal dump as follows:

- Turn off the printer.
- Turn on the printer while holding down the **FONT** and **PAPER** keys. The printer beeps once.
- Begin printing from your computer. Instead of a normal print-out, data will be printed in sixteen columns (two groups of eight) of hexadecimal numbers. The equivalent printable characters, or dots for unprintable codes, are printed to the right of each row of hexadecimal numbers.

```

49 66 20 79 6F 75 20 61 72 65 20 77 72 69 74 69
6E 67 20 79 6F 75 72 20 6F 77 6E 20 70 72 6F 67
72 61 6D 73 20 74 6F 20 73 68 6E 64 20 6F 75 74
70 75 74 20 74 6F 0D CA 74 68 65 20 70 72 69 6E
74 65 72 20 20 69 74 20 69 73 20 73 6F 6D 65 74
69 6D 65 73 20 75 73 65 66 70 6C 20 74 6F 20 70
72 69 6E 74 20 6F 75 74 20 74 68 65 20 72 61 77
0D CA 64 61 74 61 20 74 68 61 74 20 74 68 65 20
70 72 69 6E 74 65 72 20 69 73 20 72 65 63 65 69
76 69 6E 67 2F 0D CA 0D 0A 54 68 65 6E 20 79 6F
75 20 70 65 72 66 6F 72 6D 2C 61 2C 68 65 78 61
64 65 63 69 65 61 6C 20 64 75 6D 7C 2C 2C 61 6C
6C 2C 63 6F 64 65 73 20 28 63 68 61 72 2D 0D 0A
61 63 74 65 72 20 63 6F 64 65 73 20 61 6E 64 20
63 6F 6E 74 72 6F 6C 20 63 6F 64 65 73 29 20 61
72 65 20 70 72 69 6E 74 65 64 20 6F 75 74 20 69
6E 20 68 65 78 61 2D 0D 0A 64 65 63 69 6D 61 6C
20 66 6F 72 6D 61 74 2E 2C 54 68 65 20 70 72 69
6E 74 65 72 20 64 6F 65 73 2C 6E 6F 74 20 65 78
65 63 75 74 65 20 61 6E 79 20 6F 66 20 74 68 65
0D CA 6E 6F 72 6D 61 6C 6C 79 2C 65 78 65 63 75
74 61 62 6C 65 2D 63 6F 64 65 73 2C 69 74 70 72
65 63 65 69 76 65 73 2C 28 73 75 63 68 20 61 73

```

If you are writing your own programs to send output to the printer, it is sometimes useful to print out the raw data that the printer is receiving.... When you perform a hexadecimal dump, all codes (character codes and control codes) are printed out in hexadecimal format. The printer does not execute any of the normally executable codes it receives (such as

- When the printer stops printing, put the printer in **not-ready mode**. The printer now prints the final line of the hexadecimal dump.
- To resume normal operation, turn the printer off and on again. (Unless you switch it off and on the printer will continue to print in hexadecimal).



Chapter 5

Options

The two optional accessories that you can purchase with your LC24-30 Colour printer are the push tractor unit (PT-10Q), which allows you to print on fanfold paper (continuous stationery), and the serial-to-parallel interface converter (SPC-8K), which allows you to connect the printer to your computer via your computer's 25-pin serial port.

Note: Make sure that the printer is switched off, when installing either the push tractor unit or the serial-to-parallel interface converter.

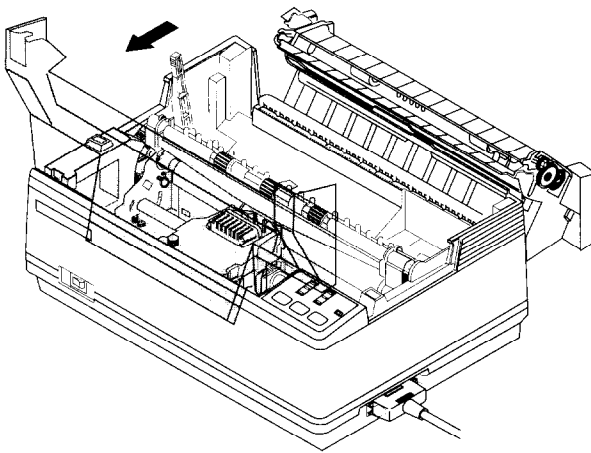
Push tractor unit

Installing the push tractor unit

The push tractor unit allows you to print on continuous fanfold paper up to 10" wide. The push tractor unit consists of two end pieces joined by two silver metal rods. The metal rods have two black sliding tractor units and a black sliding support piece mounted on them.

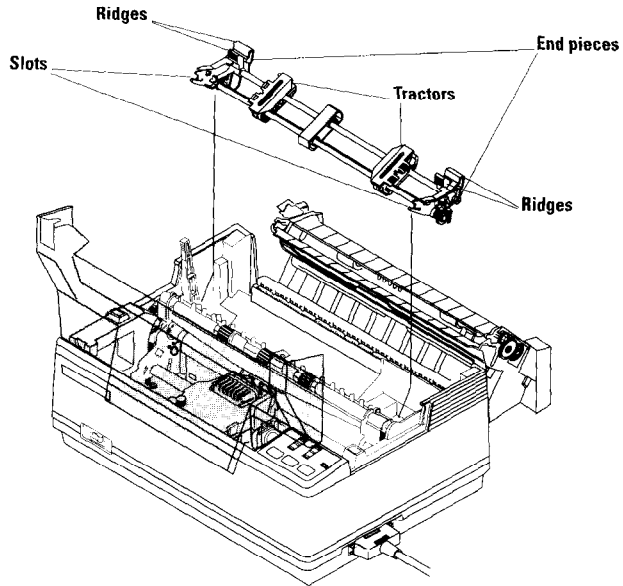
Install the push tractor unit using the following steps:

- Make sure the printer is switched off.
- Open the front cover by hooking your fingers under the two small projecting tabs on either side of the front cover. Grip the cover firmly and pull upwards. The front cover will come loose.
- Now pull the cover up and forwards so that it swings open.
- Open the rear cover by pushing it backwards so that it folds back and down.

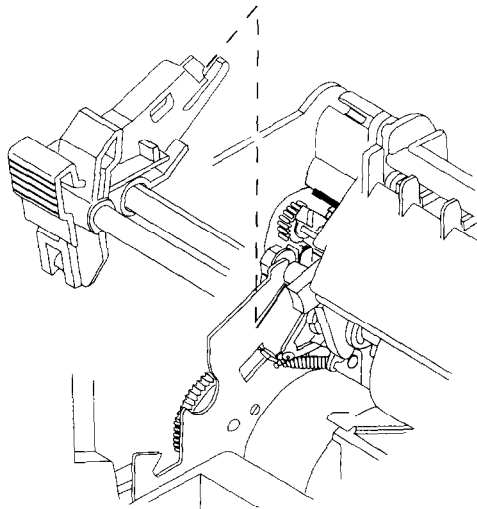


- Pull the release lever forward.

- Hold the push tractor unit with your thumb and forefinger on the ridges near the top and with the slot facing towards you.

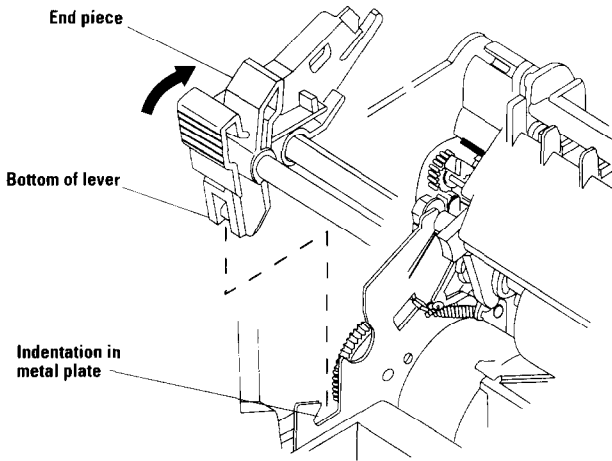


- Hook the slots in the end pieces over the shaft just behind and above the platen roller.

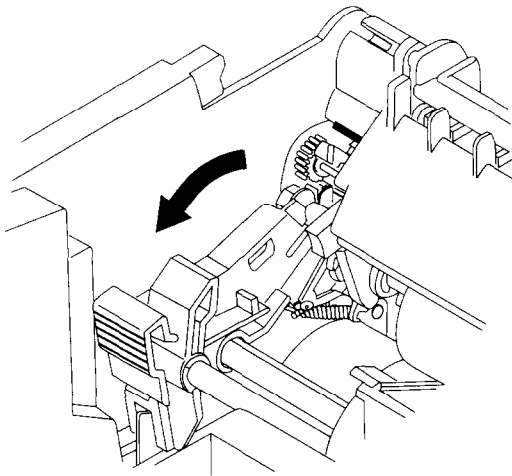


As seen from behind the printer

- Using your forefinger and thumb squeeze the end piece levers against the rear part of the end pieces. Rotate the tractor feed unit downwards until the bottom of the levers fit snugly into the indentations in the metal plate inside the printer body.

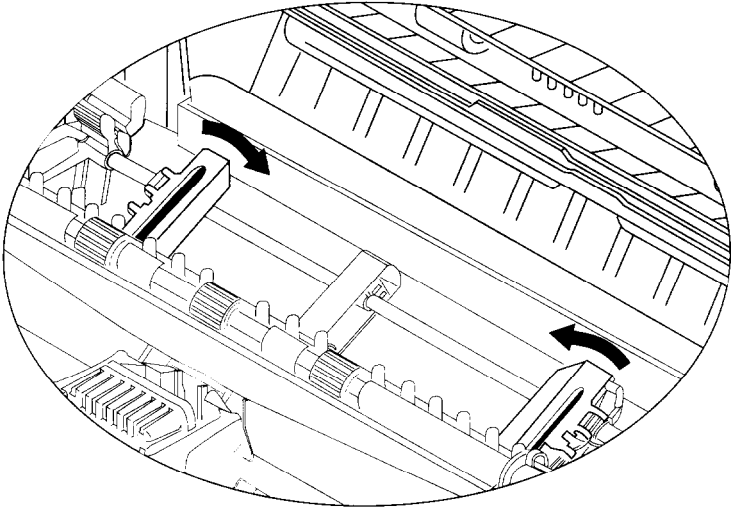


As seen from behind the printer



As seen from behind the printer

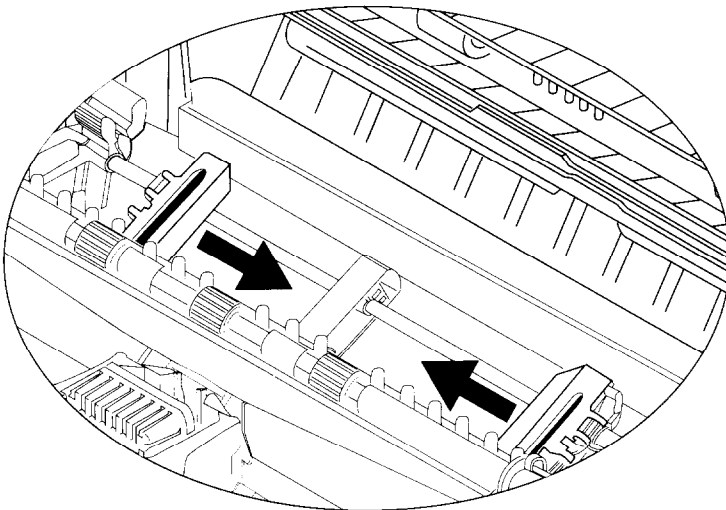
- Release the two levers and check that the tractor unit is properly secured. The unit is now locked in place. Make sure that the covers on both tractors are closed.



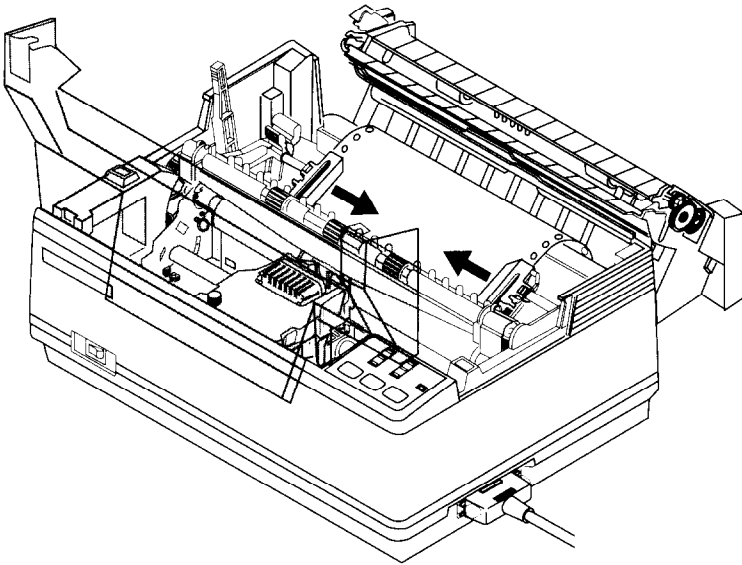
- Close the rear cover by swinging it forwards and upwards. Click it firmly back into place.
- Close the front cover.

Loading fanfold paper

- Position the stack of fanfold paper behind the printer.
- Turn the printer off.
- Pull the release lever forward.
- If there is a single sheet that has been fed into the printer, remove it.
- Open the front cover by hooking your fingers under the two small projecting tabs on either side of the front cover. Grip the cover firmly and pull upwards. The front cover will come loose.
- Now pull the cover up and forwards so that it swings open.
- Pass the fanfold paper through the horizontal slot in the back of the printer.
- Open the rear cover by pushing it backwards so that it folds back and down. Pull the paper through.
- Pull the gray levers on the tractors forward and adjust the tractors' positions by sliding them side-ways.



- Lock the tractors in position by pushing the levers back down again.
- Open the covers on both tractors and position the paper by aligning the holes in the paper with the pins on the tractors.
- Ensure that the paper is properly aligned on the tractor pins. Otherwise, it may tear or jam.
- Close the tractor covers. If necessary, make any final adjustments to the paper position. Release one or both of the tractors by pulling the gray levers forward and moving the tractors sideways.



- Push the gray levers backwards again to fix the paper in position.
- Close the rear cover by swinging it forwards and upwards. Click it firmly back into place.
- Close the front cover. Pull the paper delivery selector forwards and down.
- Turn the printer on. The printer will beep to indicate that the paper is not completely loaded yet.

- Press the **PAPER** key. The fanfold paper will be fed in to the starting position (if you want to adjust this position, use the procedure for setting the auto load position, described on page 60 of Chapter 4).

Note: Keep the release lever in the forward position while printing on fanfold paper.

Printing on fanfold paper

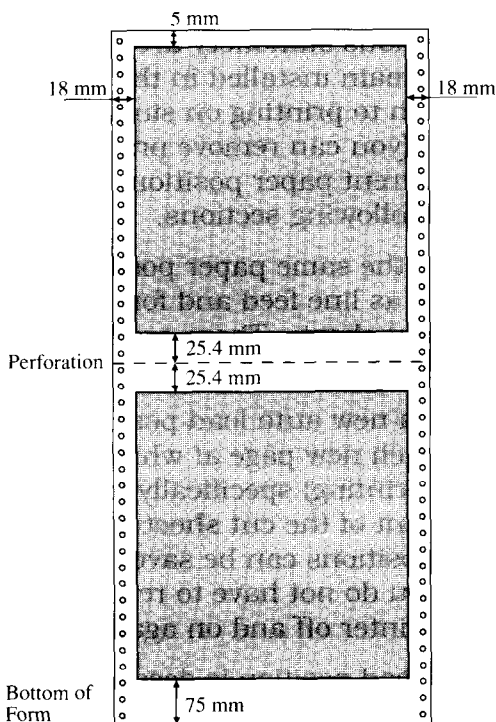
Two useful features of the LC24-30 Colour that facilitate the use of continuous stationery are paper parking (fanfold paper can remain installed in the printer while you temporarily switch to printing on single sheets), and the tear-off function (you can remove printed output without losing the current paper position). These are described in the following sections.

You can also use the same paper position adjustment techniques, such as line feed and form feed, that you use with single cut sheets. These are described on page 59 of Chapter 4.

You can also set a new auto load position (the distance from the top of each new page at which the printer automatically starts printing) specifically for fanfold paper. This is independent of the cut sheet auto load position. Both auto load positions can be saved as part of a macro, so that you do not have to reset them each time you switch the printer off and on again.

Setting the auto load position is described on page 60 of Chapter 4. Saving macro settings is described on page 62 of Chapter 4.

When printing on continuous stationery, take care not to print too close to the perforations which separate each sheet. This can cause poor quality output, paper misalignment or paper jamming. The recommended printable area for fanfold paper is shown in the following diagram.



If you need to use continuous multi-part forms, use the type which has both side edges glued together. Do not use forms with more than three parts.

Make sure that the print gap is correctly set for the thickness of paper that you are using. Setting the print gap is described on page 63 of Chapter 4.

Parking paper

If you want to use single sheets, but do not want to remove the fanfold paper, you can “park” the fanfold paper.

- Tear off the paper at a perforation, so that not more than half a page protrudes above the paper delivery selector (if necessary, put the printer in **not-ready mode** and feed paper through by pressing the **PAPER** key until a perforation is just visible above the paper delivery selector).
- Make sure that the printer is in **ready mode** and that the release lever is forward. Press the **PAPER** key. The printer now automatically feeds the paper backwards until it is no longer in contact with the platen.
- Push the release lever backwards. Now you can load and print on single sheets.

When you want to resume using fanfold paper, you can “unpark” it as described in the following section.

Unparking paper

To resume using fanfold paper, you can “unpark” the fanfold paper as follows:

- Remove all single sheets from the printer.
- Pull the release lever forward.
- Press the **PAPER** key. The printer feeds the parked fanfold paper back into position, ready for printing.

Note: You can always unpark paper, whether the printer is in “ready mode” or “not-ready mode”.

Using the tear-off function

You can remove finished fanfold output without disturbing the current position of the paper.

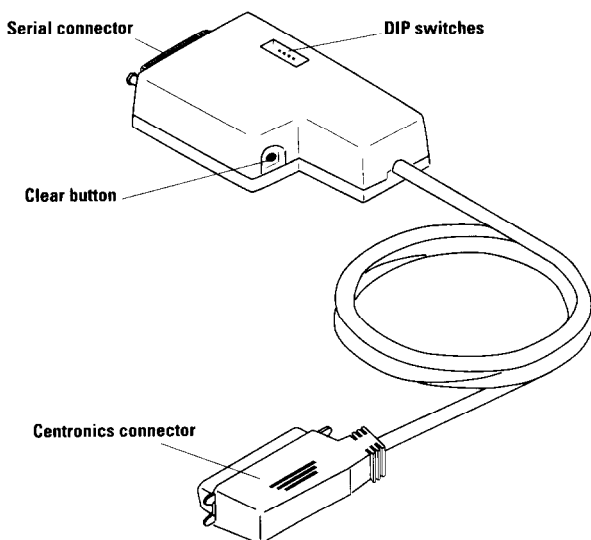
- Make sure that the printer is in **ready mode**, hold down the **READY** key and then hold down the **PAPER** key. Keep both keys held down. The printer starts to feed the paper through the printer.
- Release both keys. The printer automatically goes into **not-ready mode**.
- Tear off the paper, using the paper delivery selector's tear-assist edge.
- Press the **READY** key again. The printer winds the paper back to its former position so that printing can be resumed. The printer remains in **ready mode**.

Serial-to-parallel interface converter

You can connect the printer to your computer via one of your computer's serial ports using the serial-to-parallel converter (SPC-8K). To do this, you will also need an additional serial converter cable.

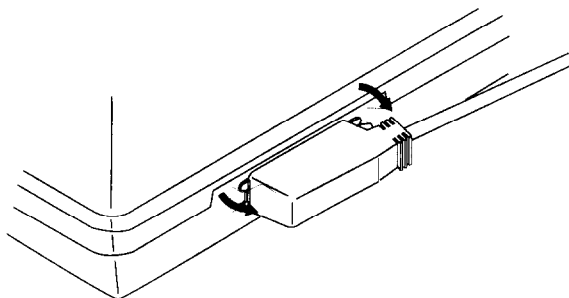
To connect the printer to your computer using the serial-to-parallel converter, proceed as follows (you will also find it helpful to refer to the SPC-8K User's Manual and your MS-DOS or Windows User's Guide).

Connecting the serial-to-parallel converter

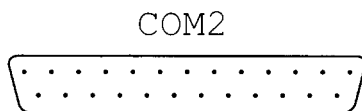


- Turn off the printer and unplug the printer's power cable.

- Plug the interface converter's Centronics connector into the socket on the side of the printer. Secure it with the retaining clips.



- Connect the interface connector's 25-pin D-type connector to one end of the serial converter cable.
- Plug the other end of the serial converter cable into one of your computer's serial ports. The computer's serial ports are usually labelled COM1, COM2 etc. COM1 is normally a 9-pin serial port and COM2 is normally a 25-pin port.



- Make sure that the serial-to-parallel converter is resting on a stable, level surface, so that it will not be prone to vibration or damage.

Note: Consult your dealer if you are unsure about the type of serial converter cable that you need.

Setting the converter's DIP switches

- Set the DIP switches on the converter so that the settings match the settings you intend to make on your computer.
- The DIP switches on the serial-to-parallel converter correspond to the following settings. The equivalent settings that you will need to make in MS-DOS's AUTOEXEC.BAT file, or in the *Ports* option in Windows' *Control Panel*, are also listed. The converter's default settings are shown in gray.

Switch	Function
1	Data length
2	Parity
3	Protocol
4	Protocol
5	Parity
6	Baud rate
7	Baud rate
8	Baud rate

Data length is the length in bits of the data unit (or byte) that the computer transmits. Normally this is set to 8.

Switch 1	Data length	DOS/Windows setting
ON	8-bit	8
OFF	7-bit	7

Parity is a means of checking for transmission errors.

Switch 2	Switch 5	Parity	DOS/Windows setting
ON	ON or OFF	No parity	N
OFF	ON	Odd	O
OFF	OFF	Even	E

Protocol (or “handshaking”) is the communications convention used between the computer and printer to regulate the flow of data. DTR is the most commonly used protocol.

Switch 3	Switch 4	Protocol
ON	ON	DTR
ON	OFF	XON/XOFF
OFF	ON	ETX/ACK

Baud rate is the rate in bits per second at which data is sent to the printer. Typically 9600 or 19200 is used.

Switch 6	Switch 7	Switch 8	Baud rate	DOS/Windows setting
OFF	OFF	OFF	150 bps	150
OFF	OFF	ON	300 bps	300
OFF	ON	OFF	600 bps	600
OFF	ON	ON	1200 bps	1200
ON	OFF	OFF	2400 bps	2400
ON	OFF	ON	4800 bps	4800
ON	ON	OFF	9600 bps	9600
ON	ON	ON	19200 bps	19200

Setting up a serial connection

Make settings on your computer to correspond to the settings you have made using the DIP switches.

On a Windows computer

- Double-click the *Control Panel* icon in the *Main* window.
- Double-click the *Printers* icon
- Make sure that **LC24-30 Colour** is selected in the *Installed Printers* list.
- Click on *Connect*
- Click on the serial port (COM*n*) to which the serial-to-parallel converter is connected.
- Click *OK* to return to the *Printers* window.
- Click *Close* to return to the *Control Panel* window.
- Double-click on *Ports*. The *Ports* dialog box appears.
- Click on the name of the port to which the serial-to-parallel converter is connected.
- Click on *Settings*.
- For each setting (*Baud Rate*, *Data Bits*, *Parity*, *Stop Bits* and *Flow Control* (protocol)) select the appropriate setting from the pull-down menu (alternatively, you can type in your selections directly).
- Click *OK* to return to the *Ports* window.
- Click *Close* to return to the *Control Panel* window.

On an MS-DOS computer

If you are using an IBM PC or compatible running MS-DOS, edit the AUTOEXEC.BAT file to include a line that reads:

```
MODE LPT1:=COMn:
```

n stands for a number: 1, 2, 3 etc.

COMn must match the name of the serial port to which the serial-to-parallel converter is connected. Usually it will be **COM2**.

This line sends printer output to the COM*n* serial port.

Also add a line of the form

```
MODE COMn:baud,parity,data length,stopbits,p
```

to set up the COM*n* port to match the DIP switch settings on the serial-to-parallel converter. For example,

```
MODE COM2:9600,N,8,1,p
```

will set up COM2 to run at 9600 baud, with no parity, a data length of 8 bits, and 1 stop bit (an MS-DOS byte-terminating convention). The 'p' indicates that the printer will continually try to re-transmit data, should an error occur.

Refer to your *MS-DOS User's Guide* if you need further information on the **MODE** command.