LC24-30

COLOUR

USERS MANUAL

VDE Statement

This device carries the VDE RFI protection mark to certify that it meets the radio inter-ference 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 accor-dance 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.

Bescheinigung des Importeurs

Hiermit wird bescheinigt, daß der
COMPUTER DRUCKER Q24190S
in Übereinstimmung mit den Bestimmungen der
VDE 0878 3/22.89, EN 55022: 1987, BMPT Vfg. 243/1991 und 46/1992
funk-entstört ist.

Dem Zentralamt für Zulassungen im Femmeldewesen wurde das Inverkehrbringen dieses Gerätes angezeigt und die Berechtigung zur Überprüfung der Serie auf die Einhal-tung der Bestimmungen eingeräumt.

Star Micronics Deutschland, GmbH

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Frankfurt, Germany

The above statements apply only to printers marketed in Germany.

Trademark acknowledgments

LC24-30 Colour, LC24-200 Colour, LC24-200, PT-10Q, SPC-8K: Star Micronics Co. Ltd.

LQ850, LQ860, LQ1050, LQ1060: Seiko Epson Corporation

IBM PC, IBM Proprinter X24E, IBM Proprinter XL24E, IBM Proprinter X24, IBM Proprinter XL24: International Business Machines Corporation.

TrueType Macintosh: Apple Computer Inc.

PostScript: Adobe Systems Incorporated.

MS-DOS, Microsoft Windows, Windows 3.1: Microsoft Corporation

Grappler: Orange Micro Inc.

Notice

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 4 - Printer reference

Appendix

Customer service information

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.

Paper guides
Release lever
Paper support
Paper delivery selector
Front cover
Extension cover
Stack wire
Power switch
Control panel
Interface connector

The printer

Thumb wheel
Paper tray
Adjustment lever
Platen
Ribbon cartridge
Print head
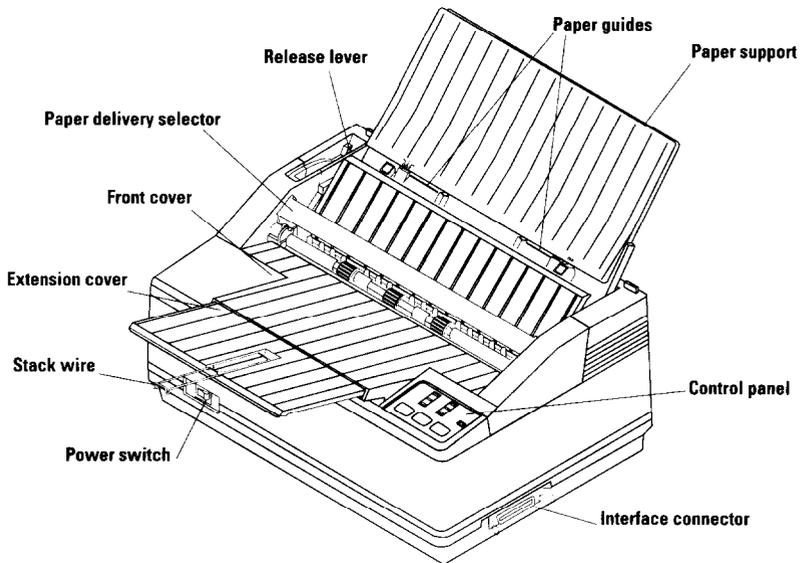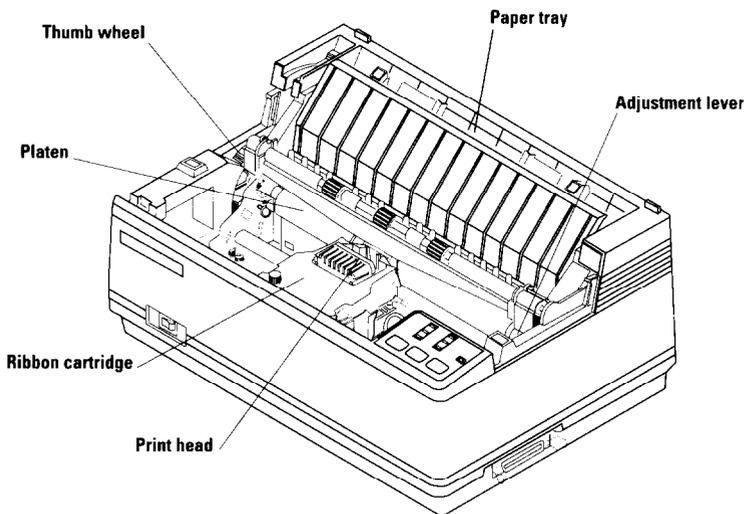
The printer with the front cover removed

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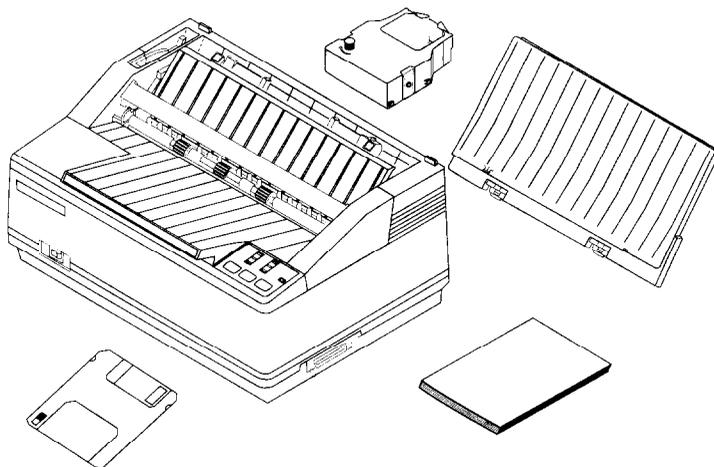
If anything is missing, contact the store where you bought the printer and ask them to supply the missing part.

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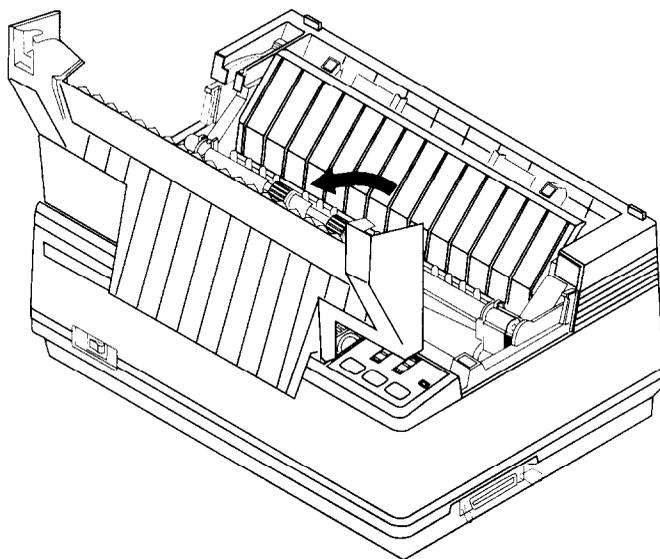
Note:	If you wish, you can remove the front cover completely. However, we strongly recommend that you put it back on the printer again as soon as you have installed the ribbon cartridge. This cover prevents objects that may damage the printer from getting inside it, and also reduces printing noise.

Installing the ribbon cartridge

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

Tension knob
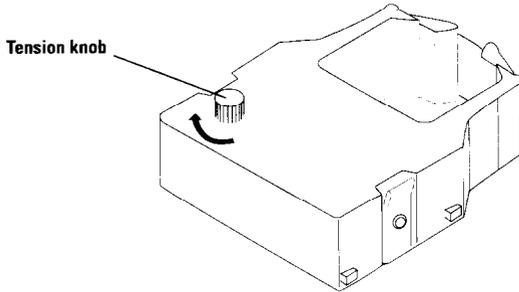
- Gently lower the cartridge into the cartridge holder. Make sure that the spindle on the cartridge holder fits into the socket on the base of the cartridge.
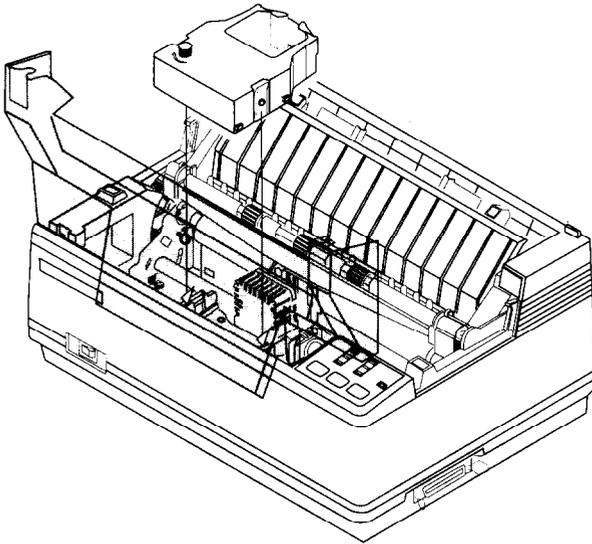
- Carefully position the ribbon between the print head and the print head shield as shown.

Ribbon

Print head shield

Print head
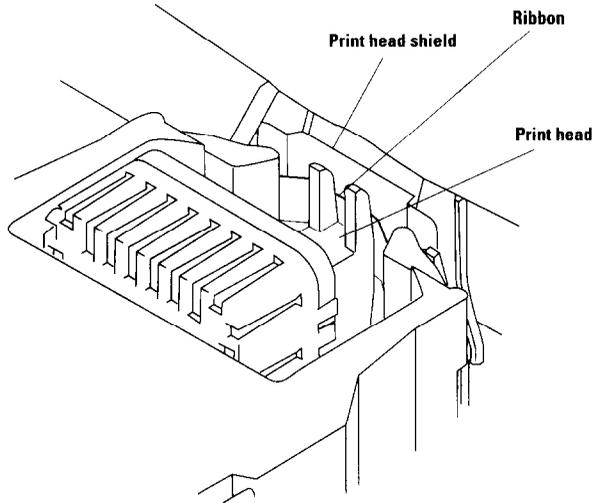
- Push down gently but firmly on the cartridge to make sure that it is properly in place. You should be able to feel a small amount of play (about 1/10" - 2.5mm) in the cartridge as you press down on it.

- 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.
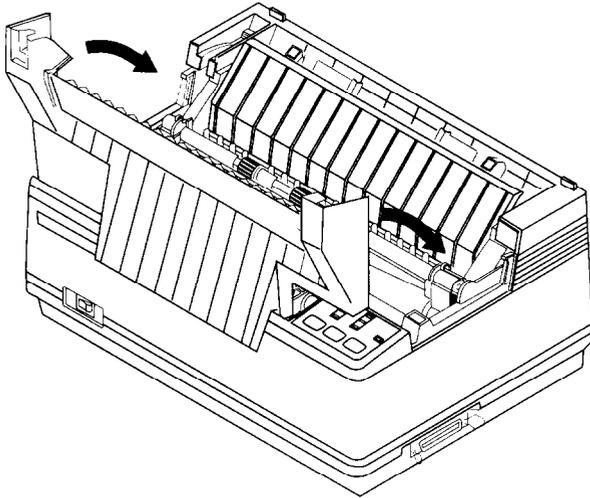
Fitting the paper support

- Fit the two tabs on the paper support into the rear cover slots as shown.
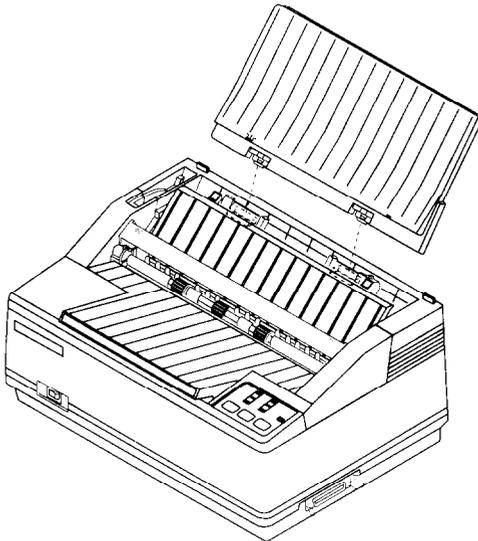
Connecting the printer to your computer

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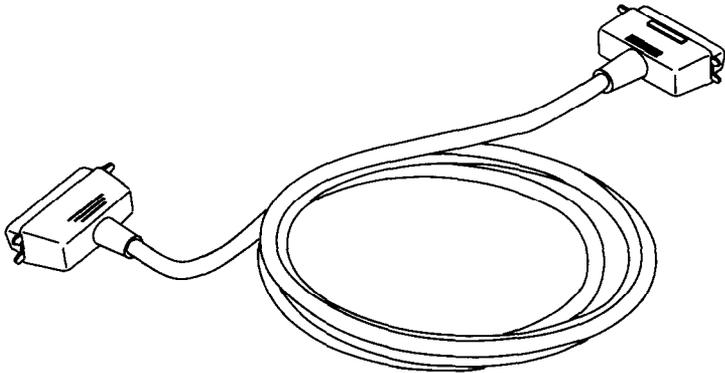
The parallel cable has a 25-pin "D-type" plug at one end, and a 36-pin Centronics connector at the other. Plug the 25-pin plug into the parallel socket on your computer. This will probably be labelled **Printer**, **Parallel**, **PRN**, **LPT1** or something similar.

Printer
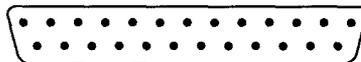
Plug the cable's Centronics connector into the socket on the side of the printer.
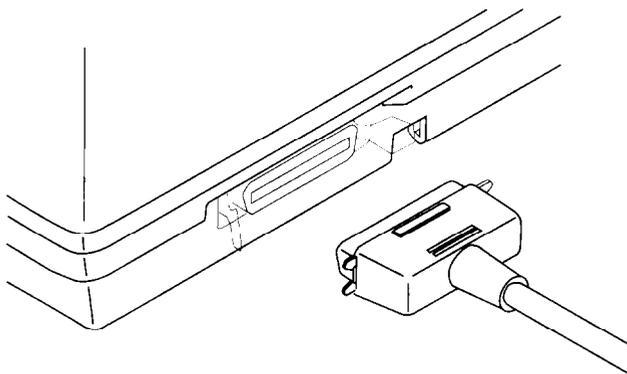
Secure the connector with the clips as shown.
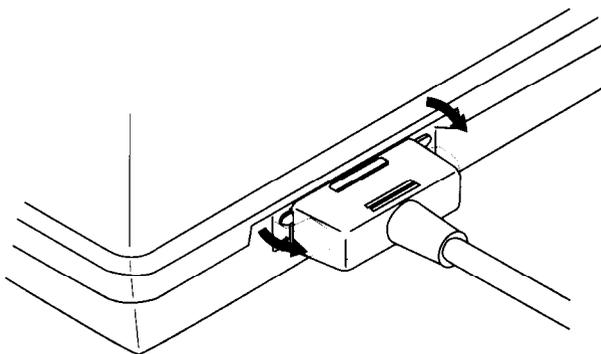
Note: Connection using the optional serial-to-parallel converter is described in Chapter 5.

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.

Paper tray cover
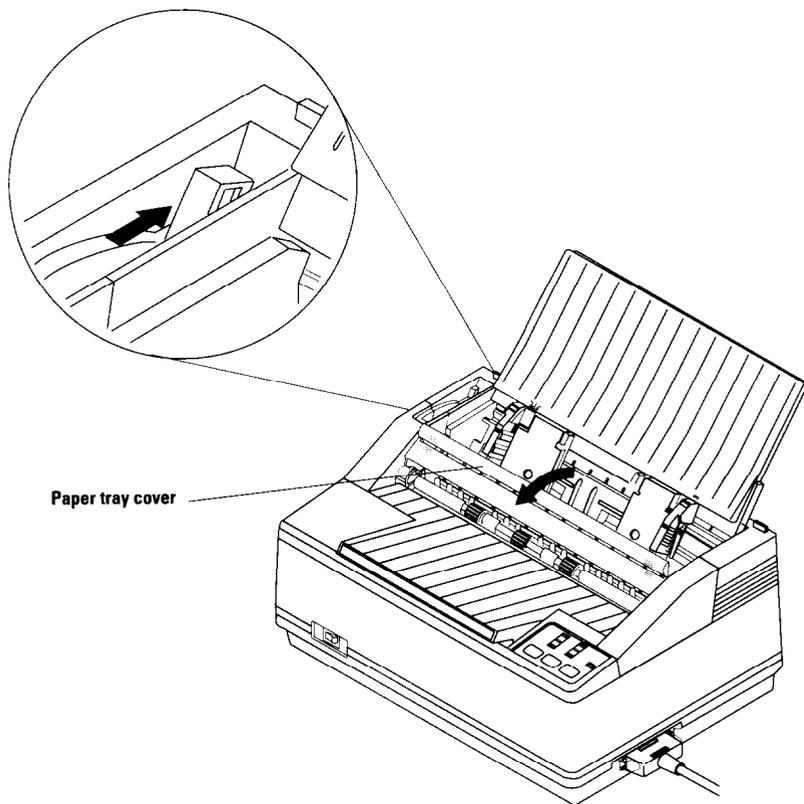
- The paper guides move freely from side to side.
  Adjust the left-hand paper guide to the position you
  want.
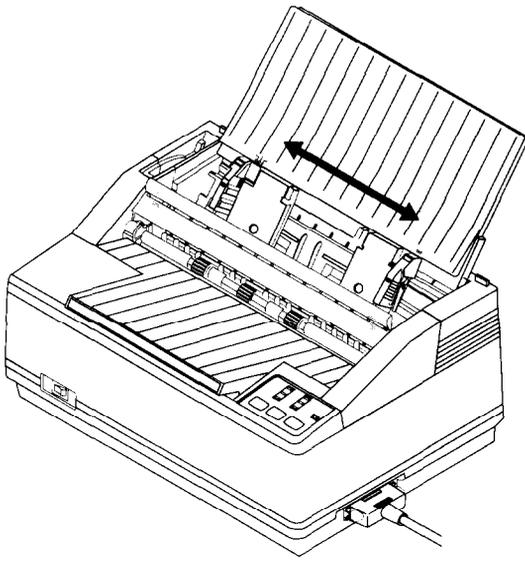
- Pick up your stack of paper.
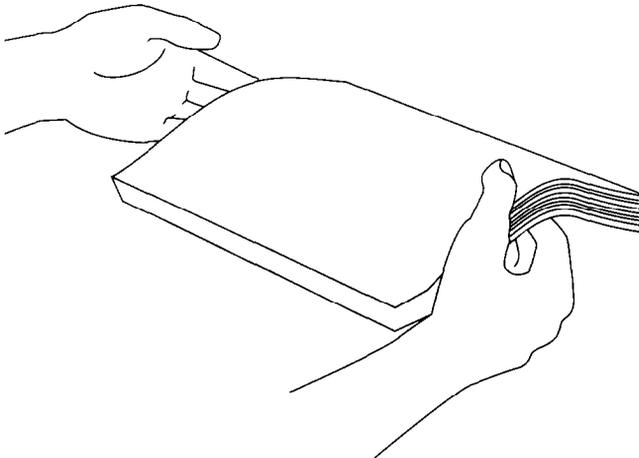
- Cut sheet paper can sometimes stick together, causing problems when the paper is drawn through the printer. To prevent this, flick through the stack of paper with your thumb. This helps ensure that each sheet of paper is loose within the stack and will be fed through the printer separately.
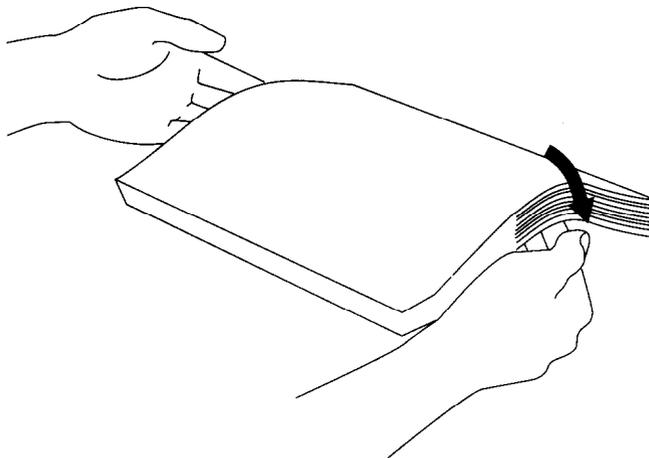
- Now make sure that all the sheets are properly lined up by tapping the end of the stack gently but firmly on a flat surface, such as a table-top.
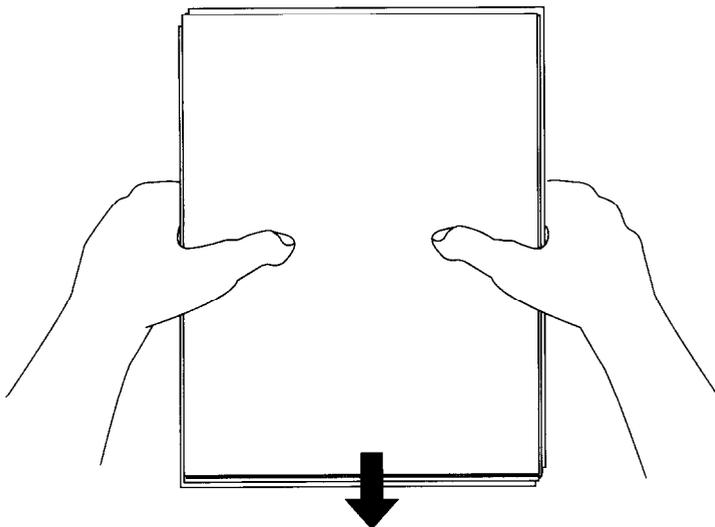
- Now place the paper in the paper tray.
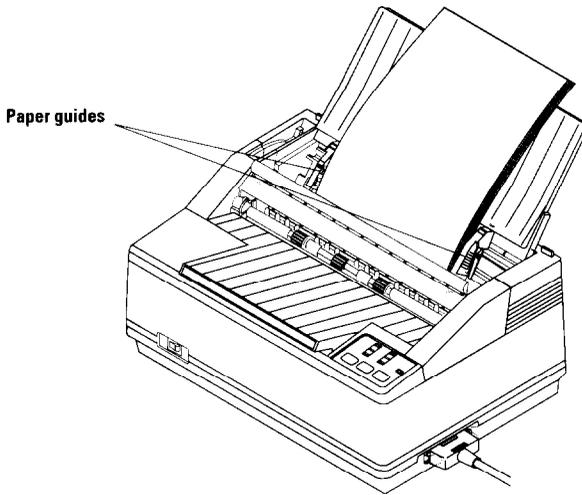
Paper guides

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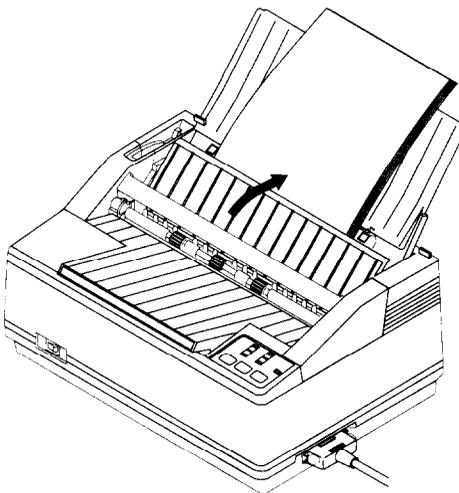
- Push the paper delivery selector up and back. Printed pages will now be delivered in a stack, face down. When you turn the stack of printed pages right-side up, the sheets will be in the order in which they were printed.

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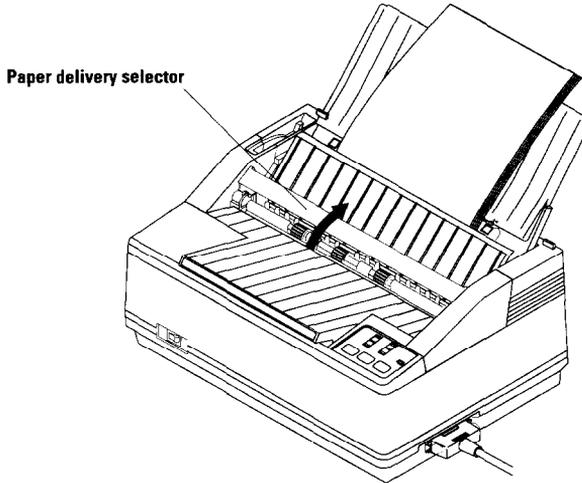
- Pull out the extension tray and pull out the stack wire to support the printed sheets.

Extension tray

Stack wire
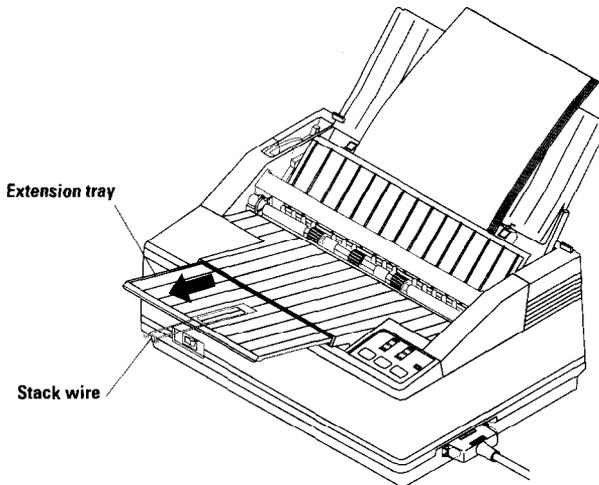
Ready mode and Not-Ready mode

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 light is on

Roman	■	A	EDS	1	■	Zoom
Sanserif	┤├	B		2	┤	
Courier	■	C		3	■	Quiet
Prestige	┤├	D		4	┤	
Script	■	E		5	■	Macro

Micro Feed

▼ Quiet ▲ ●

FONT   PAPER   READY

ALT   ● Macro   ▲ Zoom

FF

Ready mode

Ready light is flashing

Roman	■	A	EDS	1	■	Zoom
Sanserif	┤├	B		2	┤	
Courier	■	C		3	■	Quiet
Prestige	┤├	D		4	┤	
Script	■	E		5	■	Macro

Micro Feed

▼ Quiet ▲ ●

FONT   PAPER   READY

ALT   ● Macro   ▲ Zoom

FF
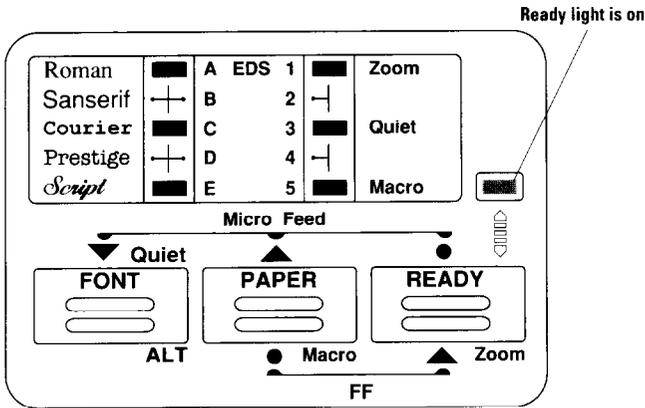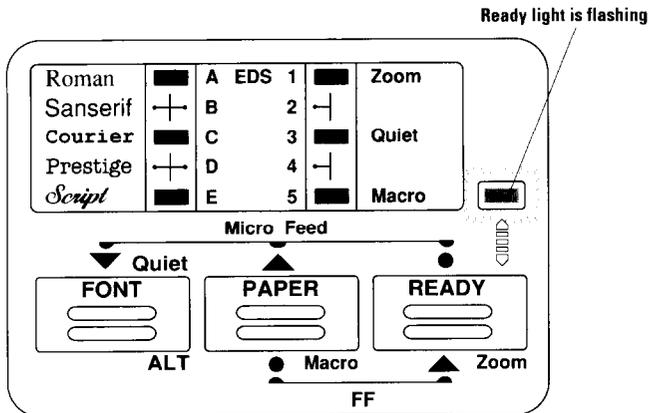
Not-ready mode

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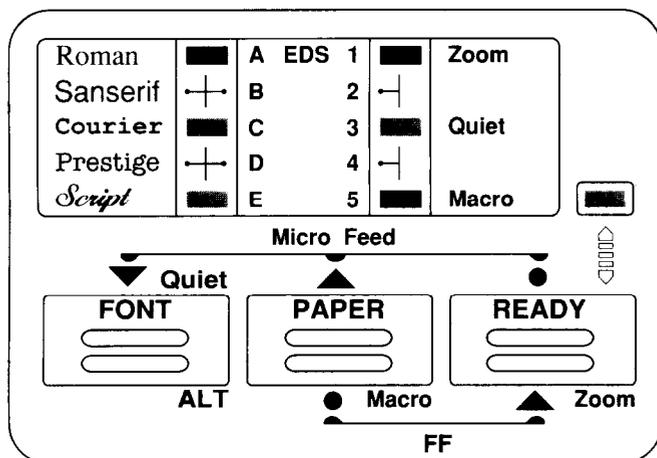
Windows users will have most settings, such as font selection and zoom resolution, determined by their computer, rather than the printer's control panel. If you try to make these settings using the control panel keys, it will have no effect.

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-850/1050 |

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 applica-
tion.

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
Cloister Black	: 1234567890	ABCDE	abcde
Cooper Black	: 1234567890	ABCDE	abcde
Dom 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
Kaufmann	: 1234567890	ABCDE	abcde
P.T.Barnum	: 1234567890	ABCDE	abcde
Raleigh Demi Bold	: 1234567890	ABCDE	abcde
Schadow 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-hand 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.
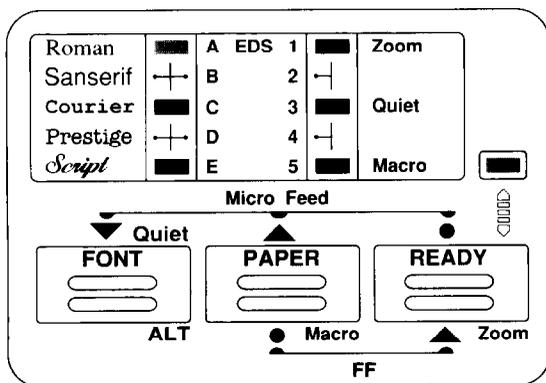
Roman typeface selected

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.

Roman	▄▄	A	EDS	1	▄▄	Zoom
Sanserif	⊣⊢	B		2	⊣	
Courier	▄▄	C		3	▄▄	Quiet
Prestige	⊣⊢	D		4	⊣	
Script	▄▄	E		5	▄▄	Macro	▄▄

Micro Feed

▼ Quiet ▲ ●

FONT **PAPER** **READY**

ALT ● Macro ▲ Zoom

FF
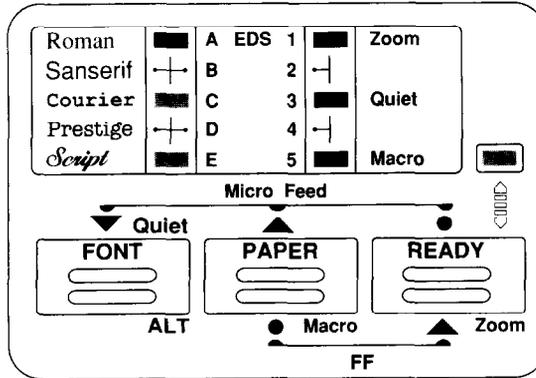
Prestige typeface selected

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.
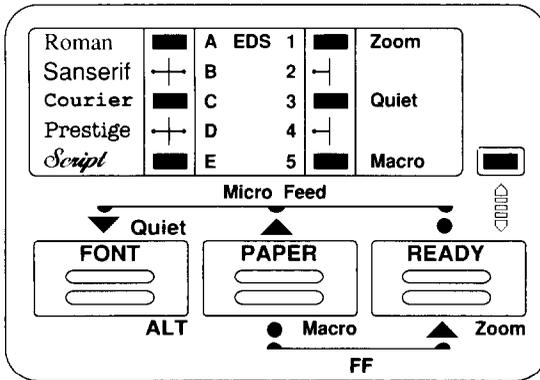
Control panel

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.

Roman	▬	A EDS 1	▬	Zoom	
Sanserif	┤├	B 2	┤		
Courier	▬	C 3	▬	Quiet	
Prestige	┤├	D 4	┤		
Script	▬	E 5	▬	Macro	▬

Micro Feed

▼ Quiet ▲ ●

FONT	PAPER	READY
⊂⊃	⊂⊃	⊂⊃
⊂⊃	⊂⊃	⊂⊃

ALT ● Macro ▲ Zoom

FF
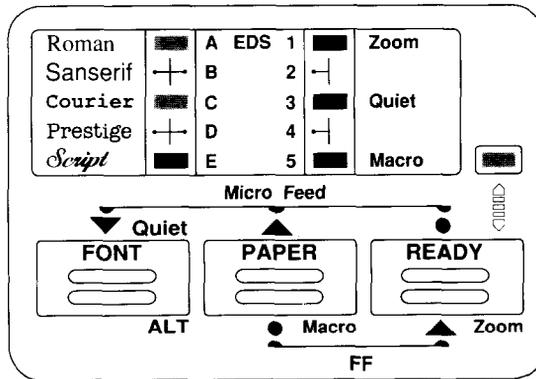
Sanserif is the selected font

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.

Roman	■■	A	EDS	1	■■	Zoom
Sanserif	⊢├	B		2	⊣	
Courier	■■	C		3	■	Quiet
Prestige	⊢├	D		4	⊣	
Script	■■	E		5	■	Macro	■■

Micro Feed

▼ Quiet   ▲   ●

FONT   PAPER   READY

ALT   ● Macro   ▲ Zoom

FF
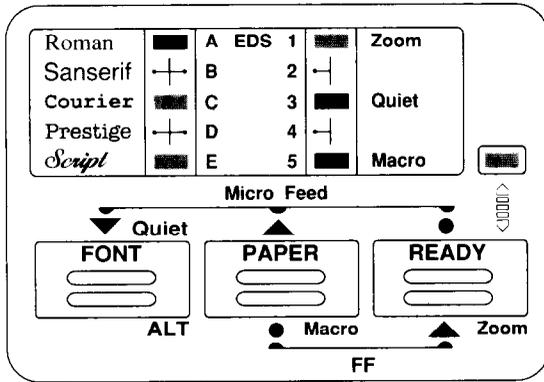
Electronic DIP Switch D1 (print quality) selected

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			
C2	Page length	See below	
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			
E2	LQ font selection	See below	
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 repre-
senting 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 com-
puter. 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 fea-
ture. 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 D 5 - 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 True-Type and Adobe PostScript type 1 fonts. To use Post-Script 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.

<div align="center">

`Courier`

Palatino

Bookman

Univers

Helvetica

Script

</div>

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 charac-ters 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 head-ings. Light stroke weight fonts have lines that are nar-rower 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, bit-map 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.**

Fanfold forms

Single sheets

5 mm

18 mm   18 mm

5 mm   5 mm

Perforation   25.4 mm
              25.4 mm

19 mm

Bottom of
Form   75 mm
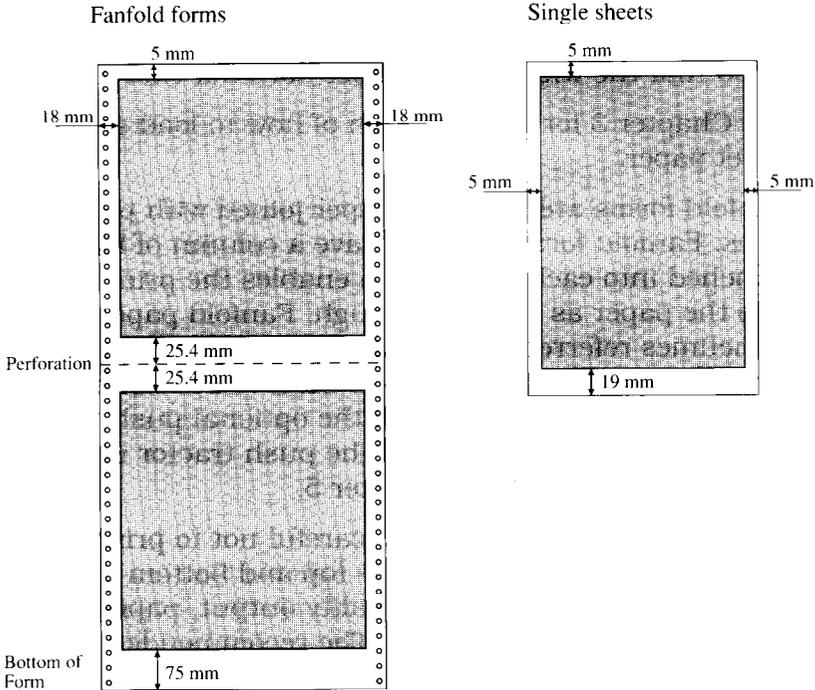
Printable areas for single sheet and fanfold paper

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

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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

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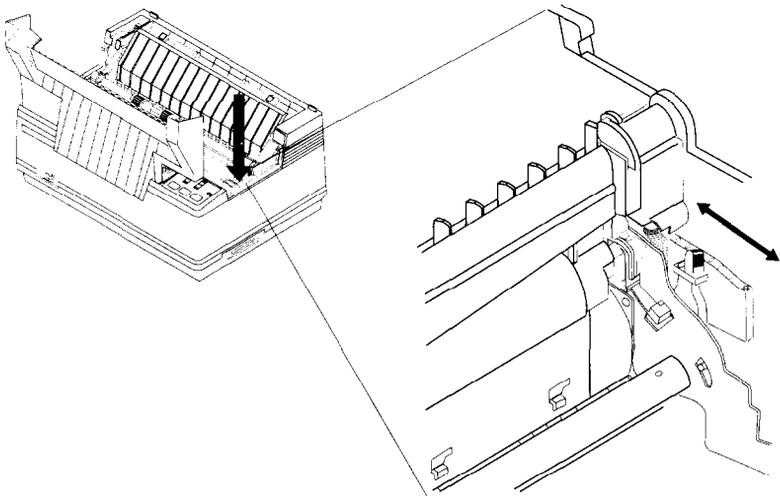
It is a good idea to try out different settings in order to
find out which setting gives the best print quality
results.

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

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 work-ing 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 ***

LQ          -3 : ╫╫╫╫╫╫╫╫╫╫╫╫╫╫╫╫╫╫╫╫╫╫╫
```

◄──── [FONT]   [PAPER] ────►

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 ***

LQ          -2 : ││││││││││││││││││││││││
```

- 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 1.3 ***
 !"#$%&'()*+,-./0123456789:;<=>?@ACBDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmno
!"#$%&'()*+,-./0123456789:;<=>?@ACBDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnop
"#$%&'()*+,-./0123456789:;<=>?@ACBDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopq
#$%&'()*+,-./0123456789:;<=>?@ACBDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqr
$%&'()*+,-./0123456789:;<=>?@ACBDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrs
%&'()*+,-./0123456789:;<=>?@ACBDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrst
&'()*+,-./0123456789:;<=>?@ACBDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstu
```

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 0A - 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    If you a re writi
6E 67 20 79 6F 75 72 20    6F 77 6E 20 70 72 6F 67    ng your  own prog
72 61 6D 73 20 74 6F 20    73 65 6E 64 20 6F 75 74    rams to  send out
70 75 74 20 74 6F 0D 0A    74 68 65 20 70 72 69 6E    put to.. the prin
74 65 72 2C 20 69 74 20    69 73 20 73 6F 6D 65 74    ter, it  is somet
69 6D 65 73 20 75 73 65    66 75 6C 20 74 6F 20 70    imes use ful to p
72 69 6E 74 20 6F 75 74    20 74 68 65 20 72 61 77    rint out  the raw
0D 0A 64 61 74 61 20 74    68 61 74 20 74 68 65 20    ..data t hat the
70 72 69 6E 74 65 72 20    69 73 20 72 65 63 65 69    printer  is recei
76 69 6E 67 2E 0D 0A 0D    0A 57 68 65 6E 20 79 6F    ving.... .When yo
75 20 70 65 72 66 6F 72    6D 20 61 20 68 65 78 61    u perfor m a hexa
64 65 63 69 6D 61 6C 20    64 75 6D 70 2C 20 61 6C    decimal  dump, al
6C 20 63 6F 64 65 73 20    28 63 68 61 72 2D 0D 0A    l codes  (char-..
61 63 74 65 72 20 63 6F    64 65 73 20 61 6E 64 20    acter co des and
63 6F 6E 74 72 6F 6C 20    63 6F 64 65 73 29 20 61    control  codes) a
72 65 20 70 72 69 6E 74    65 64 20 6F 75 74 20 69    re print ed out i
6E 20 68 65 78 61 2D 0D    0A 64 65 63 69 6D 61 6C    n hexa-. .decimal
20 66 6F 72 6D 61 74 2E    2C 54 68 65 20 70 72 69    format.  The pri
6E 74 65 72 20 64 6F 65    73 20 6E 6F 74 20 65 78    nter doe s not ex
65 63 75 74 65 20 61 6E    79 20 6F 66 20 74 68 65    ecute an y of the
0D 0A 6E 6F 72 6D 61 6C    6C 79 20 65 78 65 63 75    ..normal ly execu
74 61 62 6C 65 20 63 6F    64 65 73 20 69 74 20 72    table co des it r
65 63 65 69 76 65 73 20    28 73 75 63 68 20 61 73    eceives  (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.
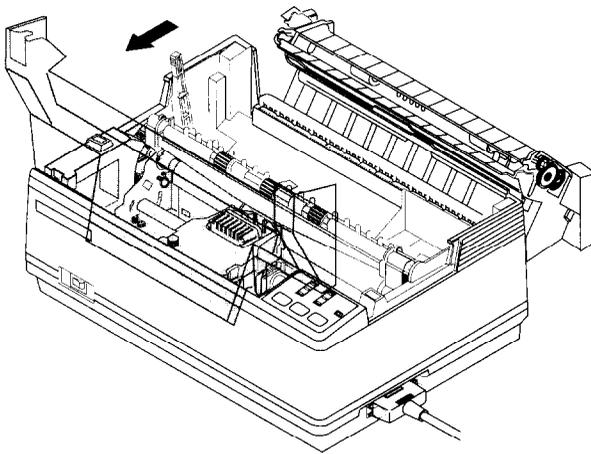
• Pull the release lever forward.

- Hold the push tractor unit with your thumb and forefinger on the ridges near the top and with the slot facing towards you.
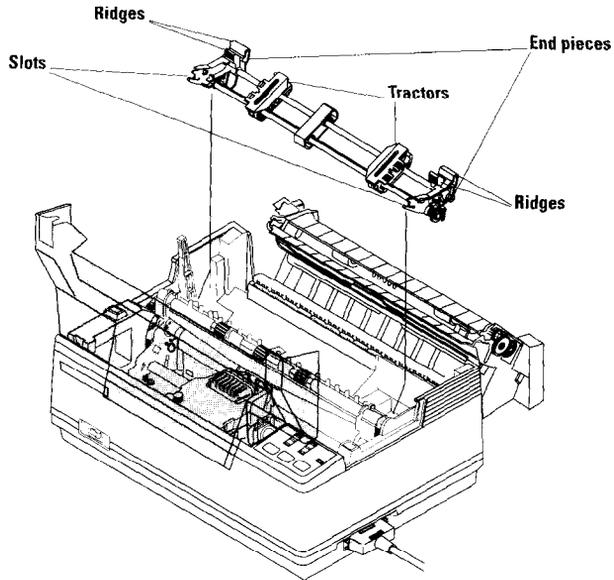
- Hook the slots in the end pieces over the shaft just behind and above the platen roller.
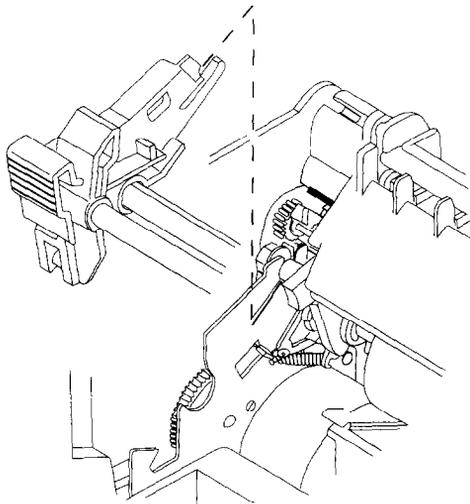
As seen from behind the printer

- 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.
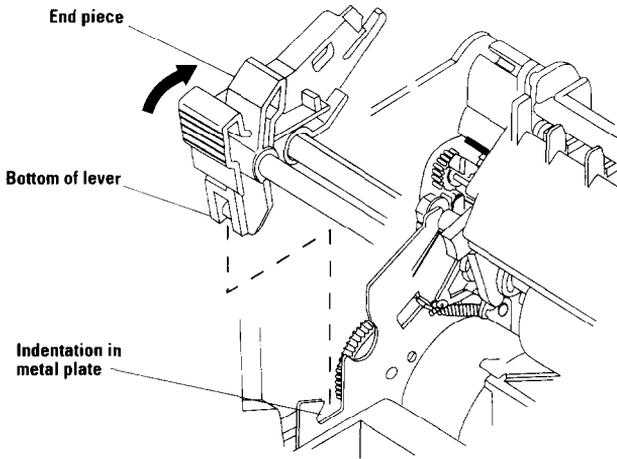
As seen from behind the printer
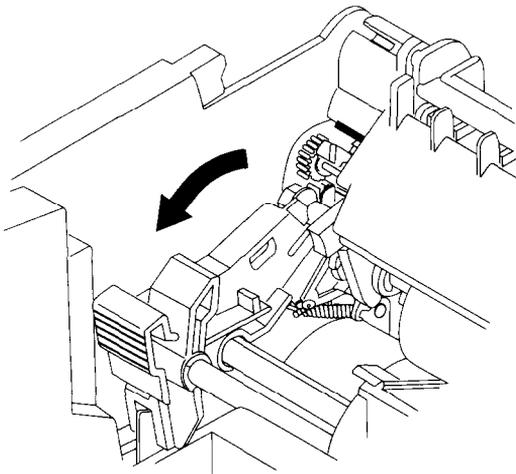
As seen from behind the printer

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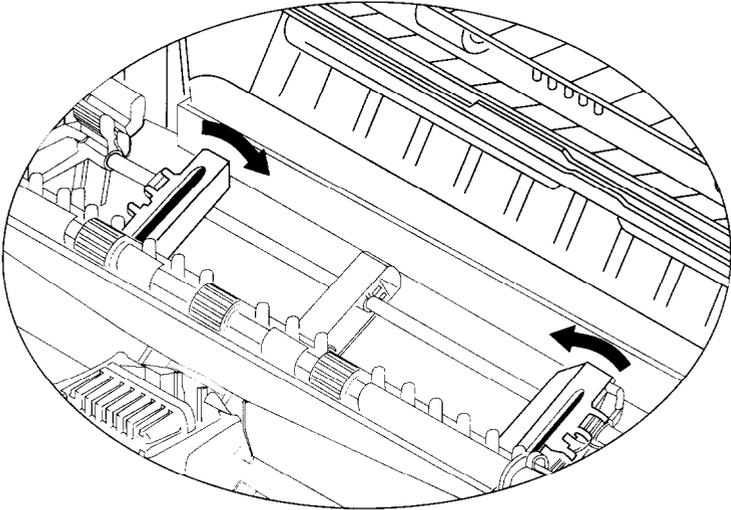
- Close the rear cover by swinging it forwards and upwards. Click it firmly back into place.
- Close the front cover.

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.
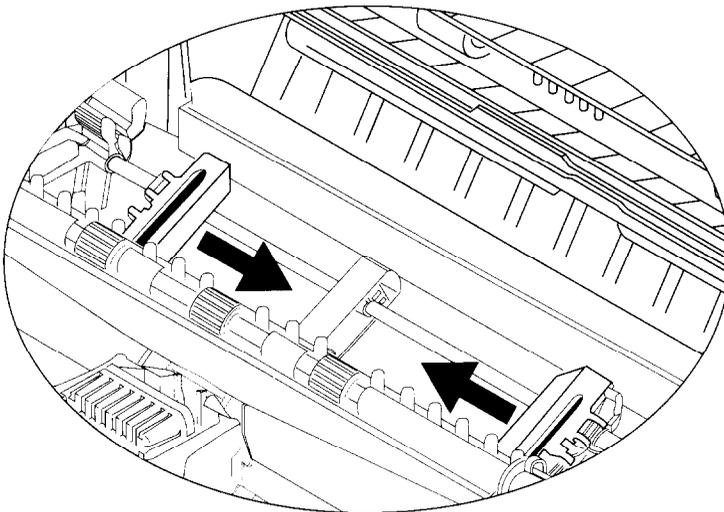
- Lock the tractors in position by pushing the levers back down again.

- 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.
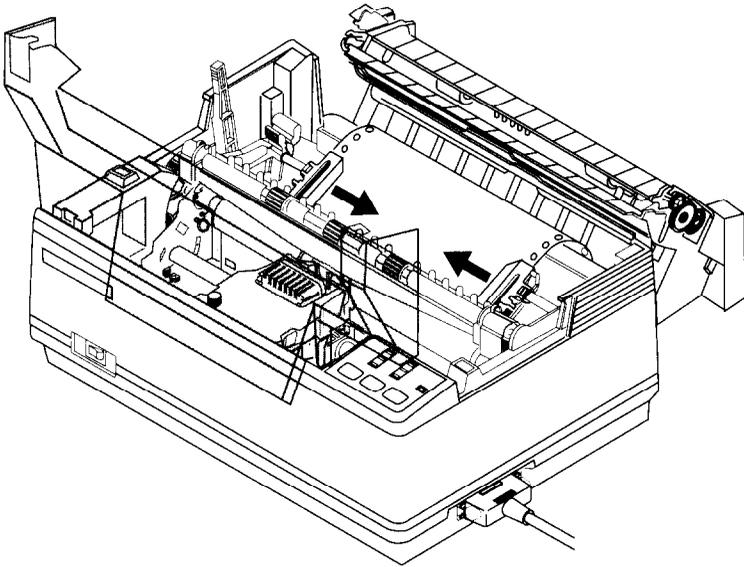
- Push the gray levers backwards again to fix the paper in position.

- 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 $\boxed{\text{PAPER}}$ 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.

Labels on diagram:
5 mm
18 mm — 18 mm
Perforation
25.4 mm
25.4 mm
Bottom of Form
75 mm
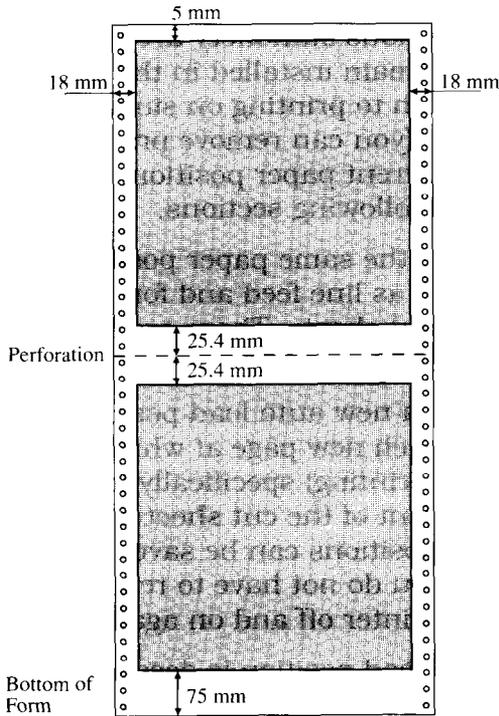
If you need to use continuous multi-part forms, use the type which has both side edges glued together. Do not use forms with more than three parts.

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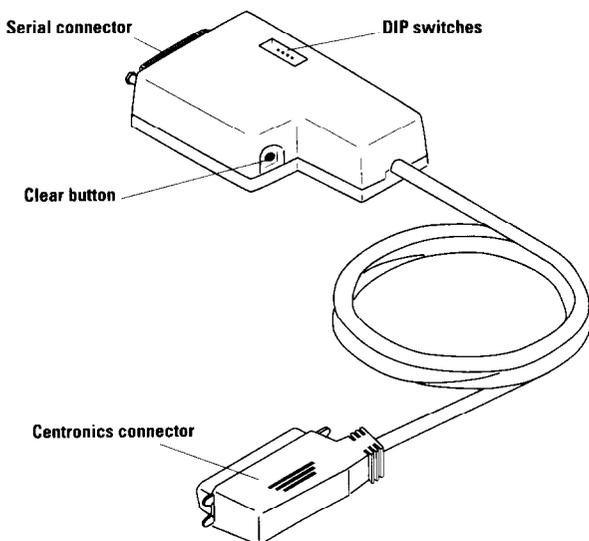
* Turn off the printer and unplug the printer's power cable.

- Plug the interface converter's Centronics connector into the socket on the side of the printer. Secure it with the retaining clips.
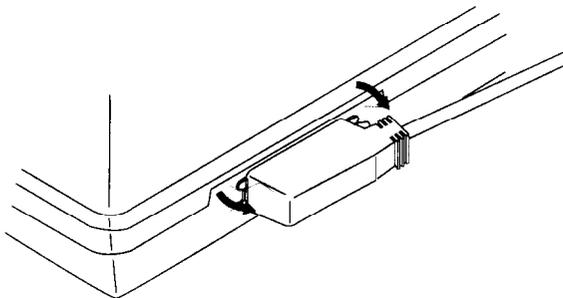
- Connect the interface connector's 25-pin D-type connector to one end of the serial converter cable.

- 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.

COM2
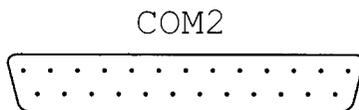
- Make sure that the serial-to-parallel converter is resting on a stable, level surface, so that it will not be prone to vibration or damage.

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 con-
vention used between the computer and printer to regu-
late 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:=COM*n***:**

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

COM*n* 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 COM*n*:*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.

Chapter 6 Troubleshooting

Your LC24-30 Colour printer should perform without any problem most of the time. However, things will go wrong from time to time. A list of common problems and corresponding suggestions for curing them is given below.

A further section, *Checking system software settings*, suggests ways for you to check whether your system software (MS-DOS or Windows) is correctly set up for printing.

If the suggested remedies do not cure the problem, consult the store where you purchased your printer for assistance.

Note: The printer contains high voltages. Do not try any repair operation other than those described in this chapter. Otherwise, you could receive an electric shock or cause damage to the printer. Attempting such an operation will void your warranty.

Common problems and solutions

Possible cause	Action
Printer is not receiving power	Check whether the power cord is correctly connected. If it is, try a different power cord.
	Check whether the power source is working by unplugging the printer and plugging in another device.

Possible cause	Action
The ribbon is jammed, twisted or not set properly between the print head and the print head shield.	Make sure that the ribbon cartridge is correctly installed. Refer to *Preparing the printer* on page 9 of Chapter 2.
The print gap is not set correctly.	Use the adjustment lever to set the print gap. Move the lever to a lower (darker) setting. See *Setting the print gap* on page 63 of Chapter 4.

Possible cause	Action
The wrong emulation is selected.	Check the emulation selection (see *Selecting which emulation to use* on page 46 of Chapter 4), and change it if necessary.
The wrong printer has been selected by your application program or system software.	Check the printer selection in your application or system software. See the following section, *Checking system software settings.*
The computer system software is not set up properly for the printer or for the type of interface cable that you are using.	Check the system software settings. See the following section, *Checking system software settings.*
The interface cable is incorrectly connected, or damaged.	Check that the printer interface cable is correctly connected. If it is, try a different cable.

Font selection changes unexpectedly

Possible cause	Action
Your application software is overriding the control panel font selection. This does not apply to systems running Windows.	Use the control panel to inhibit font selection by application software. See the section *Preventing software font selection* on page 54 of Chapter 4.

Printer will not feed paper properly

Possible cause	Action
The paper tray cover is not properly closed.	Close the paper tray cover.
The release lever is in the wrong position.	Make sure that the lever is pushed back if you are printing on single sheets, or pulled forward if you are using fanfold stationery.
Paper is jamming.	Remove all paper from the printer. Reload paper.
The print gap is not set correctly.	Check the print gap. If necessary, use the adjustment lever to set the print gap. See *Setting the print gap* on page 63 of Chapter 4.

The printer will not print in color

Possible cause	Action
A monochrome ribbon cartridge is installed.	Install a color ribbon cartridge.
A printer that does not support color has been selected (either in Windows or in your application program).	Select a different printer driver (see *Setting up the printer in Windows* on page 15 of Chapter 2, and *Printing out your documents* on page 27 of Chapter 3.

Possible cause	Action
Electronic DIP Switch settings prevent use of color.	Check Electronic DIP Switch setting A4 and B3. Turn both settings to ON to enable color printing (see *Making Electronic DIP Switch settings* on page 37 of Chapter 4).

Possible cause	Action
Paper is jamming.	Check the print gap. If necessary, use the adjustment lever to set the print gap. See *Setting the print gap* on page 63 of Chapter 4.
The wrong line spacing or leading has been selected from your application program.	Choose a different setting in your application.
Auto line feed with carriage return is selected.	Check Electronic DIP Switch setting A5. Turn the setting ON to turn off automatic line feed (see *Making Electronic DIP Switch settings* on page 37 of Chapter 4).

Over-printing occurs

Possible cause	Action
Auto line feed with carriage return is not selected.	Check Electronic DIP Switch setting A5. Turn the setting to OFF to select automatic line feed (see *Making Electronic DIP Switch settings* on page 37 of Chapter 4).
Paper is jamming.	Check the print gap. If necessary, use the adjustment lever to set the print gap. See *Setting the print gap* on page 63 of Chapter 4.

Incorrect number of lines per page

Possible cause	Action
Printing is starting from the wrong place on the page.	Adjust the auto load position (see *Setting the auto load position* on page 60 of Chapter 4.)
Auto line feed with carriage return is selected.	Check Electronic DIP Switch setting A5. Turn the setting ON to turn off automatic line feed (see *Making Electronic DIP Switch settings* on page 37 of Chapter 4).

Incorrect number of lines per page	
Possible cause	**Action**
The wrong line spacing or leading has been selected from your application program.	Choose a different setting in your application.

Malformed text or graphics OR Poor printing quality	
Possible cause	**Action**
The print gap is not set correctly.	Use the adjustment lever to alter the print gap. See *Setting the print gap* on page 63 of Chapter 4.
The print head is damaged.	Return the printer to your dealer for repair.

Forms are smudged
OR
Printing is too dark

Possible cause	Action
The print gap is not set correctly.	Use the adjustment lever to set the print gap. Move the lever to a higher (lighter) setting. See *Setting the print gap* on page 63 of Chapter 4.
The ribbon is jammed, twisted or not set properly between the print head and the print head shield.	Make sure that the ribbon cartridge is correctly installed. Refer to *Preparing the printer* on page 9 of Chapter 2.
Print head shield is damaged or missing.	Return the printer to your dealer for repair.

Printer case is hot	
Possible cause	**Action**
The printer's air vents are blocked or obstructed.	Switch off the printer and allow it to cool down. Check the air vents on the underside of the printer to see if they are clogged or obstructed in any way. Remove the obstruction or clogging material if possible. If the problem persists, return the printer to your dealer for repair.

Printer makes excessive noise	
Possible cause	**Action**
The front cover is off.	Replace the front cover.
The printer is vibrating.	Move any unrelated objects that are touching the printer. Make sure that the printer is on a level, steady surface.

Printer prints beyond the edge of the paper

Possible cause	Action
The paper guides are positioned incorrectly.	Remove the paper. Adjust the position of the paper guides and reload the paper.
The ribbon is jammed, causing the print head to jam.	Make sure that the ribbon cartridge is correctly installed. Refer to *Preparing the printer* on page 9 of Chapter 2.
The paper is jamming, causing the print head to jam.	Remove all paper from the printer. Reload paper. Check the print gap. If necessary, use the adjustment lever to set the print gap. See *Setting the print gap* on page 63 of Chapter 4.
Inappropriate margin settings have been selected from your application program.	Choose different margin settings in your application.

Left margin moves towards the right during printing	
Possible cause	**Action**
The ribbon cartridge is incorrectly installed, causing the print head to jam.	Make sure that the ribbon cartridge is correctly installed. Refer to *Preparing the printer* on page 9 of Chapter 2.
The paper is not loaded properly, causing the print head to jam.	Remove all paper from the printer. Reload paper.
The print gap is not set correctly.	Use the adjustment lever to set the print gap. See *Setting the print gap* on page 63 of Chapter 4.
Static electricity caused by interference from nearby electrical devices or by a low level of humidity is affecting the printer's operation.	Make sure that the printer is not too close to any devices with electric motors or raise the humidity level.
Inappropriate settings have been selected from your application program.	Choose different settings in your application.

Some incorrect characters are being printed

Possible cause	Action
The wrong emulation is selected.	Check the emulation selection (see *Selecting which emulation to use* on page 46 of Chapter 4), and change it if necessary.
The wrong character table, code page or international character set is selected.	Check Electronic DIP Switch settings D2, D3, D4 and D5 (see *Making Electronic DIP Switch settings* on page 37 of Chapter 4).
Static electricity caused by interference from nearby electrical devices or by a low level of humidity is affecting the printer's operation.	Make sure that the printer is not too close to any devices with electric motors or raise the humidity level.
Inappropriate settings have been selected from your application program.	Choose different settings in your application.
There are wires missing from the print head.	Return the printer to your dealer for repair.

Printer behaves erratically OR Printing ceases	
Possible cause	**Action**
The interface cable is incorrectly connected or damaged	Check that the printer interface cable is correctly connected. If it is, try a different cable.
Static electricity caused by interference from nearby electrical devices or by a low level of humidity is affecting the printer's operation.	Make sure that the printer is not too close to any devices with electric motors or raise the humidity level.

Checking system software settings

In Windows

If you cannot print from your Windows application, there are three things that you can check. You may also wish to refer to the *Microsoft Windows User's Guide.*

Firstly, check that the printer has been set as the *Default Printer.*

- Double-click the *Control Panel* icon in the *Main* window.

- Double-click the *Printers* icon

- Click on **LC24-30 Colour** in the list of installed printers.

- Make sure that *Set As Default Printer* is checked. If it is not, click on the check box and try printing from your application again.

- Click on *Close* to return to the *Control Panel* window.

Secondly, check that the printer is correctly selected in your application.

- Select *Print* from the application's *File* menu. A dialog box appears listing available printers.

- Make sure that **LC24-30 Colour** is highlighted. If it is not, click on it and try printing again.

Thirdly, check that the correct port is selected.

- Double-click the *Control Panel* icon in the *Main* window.

- Double-click the *Printers* icon

- Click on **LC24-30 Colour** in the list of installed printers.

- Click *Connect.*

- Make sure that your cable is connected to the port highlighted in the port list. If you are using a parallel cable, you will probably be using LPT1. If you are using the serial-to-parallel convertor, you will be using COM1 or COM2. Click on the appropriate port name.

- Click *OK*.

- Click on *Close* to return to the *Control Panel* window.

If you still cannot print successfully, consult your software dealer for assistance.

In **MS-DOS**

If you cannot print a text file using the MS-DOS **PRINT** command, check the AUTOEXEC.BAT file to see whether it contains a statement like either of the following:

MODE LPT1:=COM1:

or

MODE LPT1:=COM2:

These statements indicate that the computer is set up to print to a printer via a serial cable, not a parallel cable. So, if you are using a parallel cable, delete the line from AUTOEXEC.BAT. Resave AUTOEXEC.BAT and restart your computer. Now try printing again.

Conversely, if you are using a serial-to-parallel converter, make sure that one of these statements is included in the AUTOEXEC.BAT file. Also make sure that it refers to the correct serial port (COM1, COM2 etc.). See *Setting up a serial connection* on page 87 of Chapter 5.

If you still cannot print, refer to the *MS-DOS User's Guide* or consult your software dealer.

If you can print from MS-DOS but cannot print from your application, check to see which printer driver is selected in the application. See *Printing out your docu-*

ments on page 27 of Chapter 3 and check the application's manual for details of printer selection.

If you still cannot print, consult your software dealer.

Warning beeps

The printer beeps both to give you warnings that something is wrong and to indicate certain conditions that are part of normal operation. A full list of printer beeps is given on page 150 of the Appendix. The table below shows the beep combinations that are associated with printer problems.

Beep combination	Meaning
Sequence of four short tones, twice	The printer is out of paper
Single tone, two seconds	The printer detects an error condition. Turn the printer off and on again.
Single tone, continuous	

Chapter 7   Software commands

Introduction

The LC24-30 Colour has two emulation modes:
Standard/Epson mode and IBM mode.

In the Standard/Epson mode, the printer emulates the
Epson LQ-860/850, and can also recognize the graphics
commands of NEC 24-wire printers. In IBM mode, the
printer emulates the IBM Proprinter X24E. Some addi-
tional command codes, which are a superset of these
emulations, are also supported.

The emulation can be changed by changing Electronic
DIP Switch (EDS) setting A1. When A1 is ON, the printer
is in Standard/Epson mode; when it is OFF, the printer
is in IBM mode (see *Selecting which emulation to use* on
page 46 of Chapter 4).

In addition, when EDS switch A2 is ON, the printer can
automatically sense which emulation is required and
will change emulation as necessary.

This chapter describes the printer's control commands.
Some commands are common to both Standard and
IBM modes. All commands will grouped by function. The
name of each command is followed by a table like the
one below:

MODE	ASCII	Decimal	Hexadecimal
Std.	<ESC> "x" <1>	27 120 1	1B 78 01

MODE: Indicates the mode in which the command is
         recognized.

Std.   Standard/Epson mode (EDS switch A1 is ON)

IBM   IBM mode (EDS switch A1 is OFF)

Both   Both Standard/Epson and IBM modes

ASCII: Indicates the ASCII coding of the command. Control characters are enclosed in angle brackets: For example, <1> means character code 1.

Decimal: Gives the command in decimal character codes.

Hexadecimal: Gives the command in hexadecimal character codes.

Parameters for which values must be supplied are indicated by letters such as *n, m* or *d*.

Font control commands

Select print quality

MODE	ASCII	Decimal	Hexadecimal
Std.	\<ESC\> "x" n	27 120 n	1B 78 n

Changes the print quality according to the value of n, as shown below:

n	Print quality
0	Draft
1	Letter quality

Ignored if the FONT LOCK mode was selected during power-up.

Select print quality

MODE	ASCII	Decimal	Hexadecimal
IBM	\<ESC\> " [" "d"	27 91 100	1B 5B 64
	\<1\> \<0\> n	1 0 n	01 00 n

Changes the print quality according to the value of n, as shown below:

n	Print quality
0	Unchanged
1 - 127	Draft
128 - 255	Letter quality

Ignored if the FONT LOCK mode was selected during power-up.

Select LQ font

MODE	ASCII	Decimal	Hexadecimal
Both	<ESC> "k" *n*	27 107 *n*	1B 6B *n*

Selects an LQ font according to the value of *n*. In draft mode, this command remains dormant and takes effect later when LQ is selected. Ignored if the FONT LOCK mode was selected during power-up.

n	Font	*n*	Font
0	Roman	3	Prestige
1	Sanserif	4	Script
2	Courier		

Select italic characters

MODE	ASCII	Decimal	Hexadecimal
Std.	<ESC> "4"	27 52	1B 34

Causes subsequent characters (except IBM block graphic characters) to be printed in italics.

Select upright characters

MODE	ASCII	Decimal	Hexadecimal
Std.	<ESC> "5"	27 53	1B 35

Cancels italic printing and causes subsequent characters to be printed upright.

Emphasized printing

MODE	ASCII	Decimal	Hexadecimal
Both	<ESC> "E"	27 69	1B 45

Causes subsequent characters to be emphasized by adding extra thickness to horizontal strokes.

Cancel emphasized printing

MODE	ASCII	Decimal	Hexadecimal
Both	<ESC> "F"	27 70	1B 46

Cancels emphasized printing.

Double-strike printing

MODE	ASCII	Decimal	Hexadecimal
Both	<ESC> "G"	27 71	1B 47

Causes subsequent characters to be printed in double-strike mode with a slight horizontal motion in between, causing a thickening of vertical strokes.

For bold print, use of double-strike is recommended in LQ mode, and combined use of emphasized and double-strike is recommended in draft mode.

Cancel double-strike printing

MODE	ASCII	Decimal	Hexadecimal
Both	<ESC> "H"	27 72	1B 48

Cancels double-strike printing.

Underlining

MODE	ASCII	Decimal	Hexadecimal
Both	<ESC> "−" n	27 45 n	1B 2D n

Causes subsequent characters to be underlined when n is 1, and cancels underlining when n is 0. Block graphics characters and spaces skipped by horizontal tabulation are not underlined.

Overlining

MODE	ASCII	Decimal	Hexadecimal
IBM	⟨ESC⟩ "_" n	27 95 n	1B 5F n

Causes subsequent characters to be overlined when n is 1, and cancels overlining when n is 0. Spaces skipped by horizontal tabulation are not overlined.

Select score

MODE	ASCII	Decimal	Hexadecimal
Std.	⟨ESC⟩ "(" "−" ⟨3⟩ ⟨0⟩ ⟨1⟩ n1 n2	27 40 45 3 0 1 n1 n2	1B 28 2D 03 00 01 n1 n2

Start score according to the values of n1 and n2, as shown below.

n1	Function	n2	Function
1	Underlining	0	Cancel score
2	Strike-through	1	Single continuous line
3	Overlining	2	Double continuous line
		5	Single broken line
		6	Double broken line

Select ornament character

MODE	ASCII	Decimal	Hexadecimal
Std.	<ESC> "q" n	27 113 n	1B 71 n

Selects an ornament character according to the value of n, as shown below.

n	Character
0	Normal
1	Outline
2	Shadow
3	Shadow and outline

Superscript

MODE	ASCII	Decimal	Hexadecimal
Both	<ESC> "S" <0>	27 83 0	1B 53 00

Causes subsequent characters to be printed as super-scripts. Does not change the character pitch.

Subscript

MODE	ASCII	Decimal	Hexadecimal
Both	<ESC> "S" <1>	27 83 1	1B 53 01

Causes subsequent characters to be printed as sub-scripts. Does not change the character pitch.

Cancel superscript or subscript

MODE	ASCII	Decimal	Hexadecimal
Both	<ESC> "T"	27 84	1B 54

Cancels printing superscripts or subscripts and returns to normal printing.

Character set commands

Select character table

MODE	ASCII	Decimal	Hexadecimal
Both	$\langle$ESC$\rangle$ "t" n	27 116 n	1B 74 n
Std.	$\langle$FS$\rangle$ "I" n	28 73 n	1C 49 n

Selects a character table according to the value of n as shown below:

n	Character table
0	Standard character set
1	IBM character set
2	Shift download character area (Standard mode only)

Select character set #1

MODE	ASCII	Decimal	Hexadecimal
Both	$\langle$ESC$\rangle$ "7"	27 55	1B 37

Selects character set #1.

Select character set #2

MODE	ASCII	Decimal	Hexadecimal
Both	$\langle$ESC$\rangle$ "6"	27 54	1B 36

Selects character set #2.

Select international character set

MODE	ASCII	Decimal	Hexadecimal
Std.	⟨ESC⟩ "R" n	27 82 n	1B 52 n

Selects an international character set according to the value of n.

n	Character set	n	Character set
0	U.S.A	8	Japan
1	France	9	Norway
2	Germany	10	Denmark II
3	England	11	Spain II
4	Denmark I	12	Latin America
5	Sweden	13	Korea
6	Italy	14	Irish
7	Spain I	64	Legal

Any one of the first eight of these character sets (from U.S.A. to Spain I) can be selected as the power-up default using EDS switches D3 to D5.

International character set variations are shown on page 156 of the Appendix.

Select IBM code page

MODE	ASCII	Decimal	Hexadecimal
Both	⟨ESC⟩ " [" "T"	27 91 84	1B 5B 54
	⟨4⟩ ⟨0⟩ ⟨0⟩	4 0 0	04 00 00
	⟨0⟩ n1 n2	0 n1 n2	00 n1 n2

Changes the code page of the current IBM character set according to the values of *n1* and *n2*, as shown below.

n1	n2	Code page
1	181	#437 U.S.A.
3	82	#850 Multi-Lingual
3	92	#860 Portuguese
3	93	#861 Icelandic
3	95	#863 Canadian French
3	97	#865 Nordic

One of these code pages can be selected as the power-up default using EDS switches D3 to D5.

The various code pages are shown in the Appendix starting on page 157.

Enable printing of all character codes

MODE	ASCII	Decimal	Hexadecimal
Std.	⟨FS⟩ "\" n1 n2	28 92 n1 n2	1C 5C n1 n2
IBM	⟨ESC⟩ "\" n1 n2	27 92 n1 n2	1B 5C n1 n2

Enables printing of all characters in the IBM character set, including those characters which are normally considered control codes. This command remains in effect for the next $n1 + n2 \times 256$ characters, where $n1$ and $n2$ are between 0 and 255. During this time no control functions are executed. If a code with no assigned character is received, the printer prints a space.

Enable printing of all character codes on next character

MODE	ASCII	Decimal	Hexadecimal
Std.	⟨FS⟩ "^" n	28 94 n	1C 5E n
IBM	⟨ESC⟩ "^" n	27 94 n	1B 5E n

This command operates like the previous command, *Enable printing of all character codes*, except that it remains in effect for only one character.

Character size and pitch commands

Pica pitch

MODE	ASCII	Decimal	Hexadecimal
Std.	<ESC> "P"	27 80	1B 50
IBM	<DC2>	18	12

In Standard mode, changes from either elite or semi-condensed to pica pitch (10 cpi) or from condensed elite to condensed pica (17 cpi). In IBM mode, changes from elite or condensed to pica (10 cpi).

Elite pitch

MODE	ASCII	Decimal	Hexadecimal
Std.	<ESC> "M"	27 77	1B 4D
IBM	<ESC> ":"	27 58	1B 3A

In Standard mode, changes from either pica or semi-condensed to elite pitch (12 cpi) or from condensed pica to condensed elite (20 cpi). In IBM mode, changes from pica or condensed to elite (12 cpi).

Semi-condensed pitch

MODE	ASCII	Decimal	Hexadecimal
Std.	<ESC> "g"	27 103	1B 67

Changes from either pica or elite to semi-condensed pitch (15 cpi).

Condensed printing

MODE	ASCII	Decimal	Hexadecimal
Both	<SI>	15	0F
	<ESC> <SI>	27 15	1B 0F

In Standard mode, changes from pica to condensed pica (17 cpi) or from elite to condensed elite (20 cpi). In IBM mode, changes from pica to condensed pica.

Cancel condensed printing

MODE	ASCII	Decimal	Hexadecimal
Both	⟨DC2⟩	18	12

In Standard mode, changes from condensed pica to normal pica or from condensed elite to normal elite. In IBM mode, always changes to normal pica.

Proportional spacing

MODE	ASCII	Decimal	Hexadecimal
Std.	⟨ESC⟩ "p" n	27 112 n	1B 70 n
IBM	⟨ESC⟩ "P" n	27 80 n	1B 50 n

Causes subsequent characters to be proportionally spaced when n is 1, and cancels it when n is 0.

Select font and pitch

MODE	ASCII	Decimal	Hexadecimal
IBM	⟨ESC⟩ "I" n	27 73 n	1B 49 n

Changes the print font and pitch according to the value of n, as shown below:

n	Font	Pitch
0	Draft	Pica
2	Letter Quality	Pica
3	Letter Quality	Proportional
8	Draft	Elite
10	Letter Quality	Elite
16	Draft	Pica condensed
18	Letter Quality	Pica condensed

Select print mode

MODE	ASCII	Decimal	Hexadecimal
IBM	`<ESC> " [" "I" <2>`	`27 91 73 2`	`1B 5B 49 02`
	`<0>    n1  n2`	`0 n1 n2`	`00 n1 n2`

Changes the print mode according to the values of *n1* and *n2*, as shown below:

n1	n2	Font	Mode	Pitch
0	11	Courier	Normal	Pica
0	12	Prestige	Normal	Pica
0	18	Courier	Italic	Pica
0	46	Courier	Emphasized	Pica
0	57	Courier	Italic emphasized	Pica
0	60	Prestige	Emphasized	Pica
0	85	Courier	Normal	Elite
0	86	Prestige	Normal	Elite
0	92	Courier	Italic	Elite
0	108	Courier	Emphasized	Elite
0	111	Prestige	Emphasized	Elite
0	112	Prestige	Italic	Elite
0	116	Courier	Italic emphasized	Elite
0	164	Prestige	Normal	Proportional
0	171	Courier	Normal	Proportional
0	172	Courier	Italic	Proportional
0	184	Courier	Emphasized	Proportional
0	185	Courier	Italic emphasized	Proportional
0	221	Prestige	Normal	Semi-condensed
0	253	Courier	Emphasized	Pica condensed
0	254	Courier	Normal	Pica condensed

n1	n2	Font	Mode	Pitch
1	1	Prestige	Normal	Pica condensed
1	201	Prestige	Normal	Pica condensed
1	202	Prestige	Normal	Elite condensed
1	235	Courier	Normal	Elite
1	236	Courier	Normal	Semi-condensed
1	237	Courier	Normal	Pica condensed
1	238	Courier	Normal	Elite condensed
1	239	Prestige	Normal	Elite
1	240	Prestige	Normal	Semi-condensed

Expanded printing

MODE	ASCII	Decimal	Hexadecimal
Both	<ESC> "W" n	27 87 n	1B 57 n

Causes subsequent characters to be expanded to double
width when n is 1, and cancels it when n is 0.

Expanded printing for one line

MODE	ASCII	Decimal	Hexadecimal
Both	<SO>	14	0E
	<ESC> <SO>	27 14	1B 0E

Causes subsequent characters in the current line to be
expanded to double width. Characters return to normal
width after the next line feed (<LF>). The <DC4>, <VT>,
<FF>, and <ESC> "W" 0 commands also cancel
expanded printing.

Cancel one-line expanded printing

MODE	ASCII	Decimal	Hexadecimal
Both	⟨DC4⟩	20	14

Cancels one-line expanded printing set with <SO> or
<ESC> <SO>.

Does not cancel expanded printing set with
<ESC> "W" 1.

Select character width

MODE	ASCII	Decimal	Hexadecimal
Std.	⟨FS⟩ "E" n	28 69 n	1C 45 n

Selects a character width according to the value of n as
shown below.

n	Character width
0	Normal-wide
1	Double-wide
2	Triple-wide

Select master print mode

MODE	ASCII	Decimal	Hexadecimal
Std.	⟨ESC⟩ "!" n	27 33 n	1B 21 n

Selects a combined print mode according to the value of
n. The value of n is the sum of the values given below for
the desired characteristics.

Function	n value	Function	n value
Underline	128	Emphasized	8
Italic	64	Condensed	4
Expanded	32	Proportional	2
Double strike	16	Elite	1

Increase character spacing

MODE	ASCII	Decimal	Hexadecimal
Std.	\<ESC\> \<SP\> n	27 32 n	1B 20 n

Increases the space between characters by n dots, where n is a number from 0 to 127. Used in micro-justification.

Print double-height characters

MODE	ASCII	Decimal	Hexadecimal
Std.	\<ESC\> "w" \<1\>	27 119 1	1B 77 01
	\<FS\> "V" \<1\>	28 86 1	1C 56 01

Prints subsequent characters double height without moving the base line and without changing the line spacing.

Return to normal height

MODE	ASCII	Decimal	Hexadecimal
Std.	\<ESC\> "w" \<0\>	27 119 0	1B 77 00
	\<FS\> "V" \<0\>	28 86 0	1C 56 00

Cancels double-height printing and prints subsequent characters normal height.

Select character height, width and line spacing

MODE	ASCII	Decimal	Hexadecimal
IBM	\<ESC> " [" "@"	27 91 64	1B 5B 40
	\<4> \<0> \<0>	4 0 0	04 00 00
	\<0> n m	0 n m	00 n m

Selects a combination of character height, width and line spacing according to the values of n and m, as shown below. Does not move the base line.

n	Line spacing	Character height
0	Unchanged	Unchanged
1	Unchanged	Single height
2	Unchanged	Double height
16	Single line	Unchanged
17	Single line	Single height
18	Single line	Double height
32	Double line	Unchanged
33	Double line	Single height
34	Double line	Double height

m	Character width
0	Unchanged
1	Single width (same as \<ESC> "W" 0)
2	Double width (same as \<ESC> "W" 1)

Vertical position commands

Set line spacing to 1/8 inch

MODE	ASCII	Decimal	Hexadecimal
Both	\<ESC\> "0"	27 48	1B 30

Sets the distance the paper advances or reverses in subsequent line feeds to 1/8 inch.

Set line spacing to 1/6 inch

MODE	ASCII	Decimal	Hexadecimal
Std.	\<ESC\> "2"	27 50	1B 32

Sets the distance the paper advances or reverses in subsequent line feeds to 1/6 inch.

Set line spacing to n/360 inch

MODE	ASCII	Decimal	Hexadecimal
Std.	\<ESC\> "+" n	27 43 n	1B 2B n
	\<FS\> "3" n	28 51 n	1C 33 n

Sets the distance the paper advances or reverses in subsequent line feeds to $n/360$ inch, where n is between 0 and 255.

Set base unit for line spacing

MODE	ASCII	Decimal	Hexadecimal
IBM	<ESC> " [" " \ " <4> <0> <0> <0> n1 n2	27 91 92 4 0 0 0 n1 n2	1B 5B 5C 04 00 00 00 n1 n2

Sets the base unit for the line spacing commands, <ESC> "3" and <ESC> "J", as shown below:

n1	n2	Line spacing unit
0	180	1/180 inch
0	216	1/216 inch
1	104	1/360 inch

This command becomes effective only after <ESC> "3" or <ESC> "J" is received. The default base unit is set to 1/216".

Set line spacing

MODE	ASCII	Decimal	Hexadecimal
Both	<ESC> "3" n	27 51 n	1B 33 n

Sets the distance the paper advances or reverses in subsequent line feeds to $n/180$ inch (STD and IBM mode), $n/216$ inch or $n/360$ inch (IBM mode only) according to the preceding base unit.

The value of n is between 0 and 255. If $n = 0$, in Standard mode the line-feed distance is set to 0, but in IBM mode the command is ignored.

Set line spacing to n/60 inch or n/72 inch

MODE	ASCII	Decimal	Hexadecimal
Both	<ESC> "A" n	27 65 n	1B 41 n

In Standard mode, sets the distance the paper advances or reverses in subsequent line feeds to $n/60$ inch, where n is between 0 and 255. If $n = 0$, the line spacing is set to 0.

In IBM mode, this command defines the distance the paper advances or reverses in subsequent line feeds to $n/72$ inch, where n is between 1 and 85. The new line spacing does not take effect until the next <ESC> "2" command.

Execute <ESC> "A"

MODE	ASCII	Decimal	Hexadecimal
IBM	<ESC> "2"	27 50	1B 32

Sets the line spacing to the value defined by the last preceding <ESC> "A" command. Sets the line spacing to 1/6 inch if there is no preceding <ESC> "A" command.

Line feed

MODE	ASCII	Decimal	Hexadecimal
Both	<LF>	10	0A

Prints the current line and advances the paper to the next line. The line spacing is set by one of the commands listed previously.

Reverse line feed

MODE	ASCII	Decimal	Hexadecimal
Std.	⟨ESC⟩ ⟨LF⟩	27 10	1B 0A
IBM	⟨ESC⟩ "]"	27 93	1B 5D

Prints the current line and moves the paper in the reverse direction to the preceding line. Ignored when the printer is in friction feed mode.

The line spacing is set by one of the commands listed previously.

Select forward feed mode

MODE	ASCII	Decimal	Hexadecimal
Std.	⟨FS⟩ "F"	28 70	1C 46

Cancels the reverse feed mode and selects forward feed mode. This is the default setting at power-on.

Select reverse feed mode

MODE	ASCII	Decimal	Hexadecimal
Std.	⟨FS⟩ "R"	28 82	1C 52

Selects reverse feed mode. Reverses the direction of all vertical movements. Ignored when friction feed is used.

Perform one-time line feed

MODE	ASCII	Decimal	Hexadecimal
Both	⟨ESC⟩ "J" n	27 74 n	1B 4A n

Feeds the paper once by n times the defined base unit ($n/180$ inches in Standard mode). The value of n is between 0 and 255. If $n = 0$, the line-feed distance is set to 0. Does not move the print position right or left. Does not change the line-spacing setting.

Perform one n/180-inch reverse line feed

MODE	ASCII	Decimal	Hexadecimal
Std.	<ESC> "j" n	27 106 n	1B 6A n

Feeds the paper once by $n/180$ inches in the reverse direction, where n is between 0 and 255. If $n = 0$, the line-feed distance is set to 0. Does not move the print position right or left. Does not change the line-spacing setting.

Set page length to n lines

MODE	ASCII	Decimal	Hexadecimal
Both	<ESC> "C" n	27 67 n	1B 43 n

Sets the page length to n lines at the current line spacing, where n is between 1 and 127.

Changing the line spacing later does not alter the physical page length. The current line becomes the first line of a new page.

Set page length to n inches

MODE	ASCII	Decimal	Hexadecimal
Both	<ESC> "C" <0> n	27 67 0 n	1B 43 00 n

Sets the page length to n inches, where n is between 1 and 32 in Standard mode or between 1 and 64 in IBM mode. The current line becomes the first line of a new page.

Set top of page at current position

MODE	ASCII	Decimal	Hexadecimal
IBM	<ESC> "4"	27 52	1B 34

Sets the current position as the top-of-page (top-of-form) position.

Set bottom margin

MODE	ASCII	Decimal	Hexadecimal
Both	<ESC> "N" n	27 78 n	1B 4E n

Sets the bottom margin to n lines, where n is between 1 and 127 in Standard mode or between 1 and 255 in IBM mode. The bottom margin is reset when you change the page length.

Cancel bottom margin

MODE	ASCII	Decimal	Hexadecimal
Both	<ESC> "O"	27 79	1B 4F

Cancels the bottom margin.

Form feed

MODE	ASCII	Decimal	Hexadecimal
Both	<FF>	12	0C

Feeds the paper to the top of the next page according to the current page length, and moves the print position to the left margin. When friction feed is used, this command ejects the current page.

Set vertical tab stops

MODE	ASCII	Decimal	Hexadecimal
Both	<ESC> "B" n1 n2 ... <0>	27 66 n1 n2 ... 0	1B 42 n1 n2 ...00

Cancels all current vertical tab stops and sets new vertical tab stops at lines n1, n2, etc., where n1, n2, etc. are numbers between 1 and 255. A maximum of 16 vertical tab stops can be set. The tab stops must be specified in ascending order; any violation of ascending order terminates the tab stop list. Standard termination is by the <0> control code. The vertical tab stops are set in terms of the current line spacing and do not move if the line spacing is changed later.

Set vertical tab stops in channel

MODE	ASCII	Decimal	Hexadecimal
Std.	<ESC> "b" *n0* *n1* *n2* ... <0>	27 98 *n0* *n1* *n2* ... 0	1B 62 *n0* *n1* *n2* ... 00

Cancels all current vertical tab stops in channel *n0*, (where *n0* is between 0 and 7) and sets new vertical tab stops in this channel. (A channel is a set of vertical tab stops selected with the <ESC> "/" command.) See the <ESC> "B" command for parameters *n1*, *n2*, ... <0>.

Select vertical tab channel

MODE	ASCII	Decimal	Hexadecimal
Std.	<ESC> "/" *n0*	27 47 *n0*	1B 2F *n0*

Selects a set of vertical tab stops designated by a channel number (*n0*) from 0 to 7. The tab stops in each channel are set by <ESC> "b".

Vertical tab

MODE	ASCII	Decimal	Hexadecimal
Both	<VT>	11	0B

Feeds the paper to the next vertical tab stop and moves the print position to the left margin. Performs a line feed if no vertical tabs are set, such as at power-up. Feeds to the top of the next page if vertical tabs are set but the current line is at or below the last vertical tab stop.

Horizontal position commands

Set left margin

MODE	ASCII	Decimal	Hexadecimal
Std.	<ESC> "l" n	27 108 n	1B 6C n

Sets the left margin at column n (where n is between 0 and 255) at the current character pitch (pica pitch if proportional spacing is selected). The left margin does not move if the character pitch is changed later. The left margin must be at least two columns to the left of the right margin and within the limits given below:

Pica	$0 \leq n \leq 76$	Expanded pica	$0 \leq n \leq 38$
Elite	$0 \leq n \leq 91$	Expanded elite	$0 \leq n \leq 45$
Semi-condensed	$0 \leq n \leq 114$	Expanded semi-condensed	$0 \leq n \leq 57$
Condensed pica	$0 \leq n \leq 130$	Expanded condensed pica	$0 \leq n \leq 64$
Condensed elite	$0 \leq n \leq 152$	Expanded condensed elite	$0 \leq n \leq 76$

Set right margin

MODE	ASCII	Decimal	Hexadecimal
Std.	<ESC> "Q" n	27 81 n	1B 51 n

Sets the right margin at column n in the current character pitch (pica pitch if proportional spacing is currently selected). Column n becomes the last character position in the line. The right margin does not move if the character pitch is changed later. The right margin must be within the limits below:

Pica	$4 \leq n \leq 80$	Expanded pica	$2 \leq n \leq 40$
Elite	$5 \leq n \leq 96$	Expanded elite	$3 \leq n \leq 48$
Semi-condensed	$6 \leq n \leq 120$	Expanded semi-condensed	$3 \leq n \leq 60$
Condensed pica	$7 \leq n \leq 137$	Expanded condensed pica	$4 \leq n \leq 68$
Condensed elite	$8 \leq n \leq 160$	Expanded condensed elite	$4 \leq n \leq 80$

Set left and right margins

MODE	ASCII	Decimal	Hexadecimal
IBM	\<ESC\> "X" n1 n2	27 88 n1 n2	1B 58 n1 n2

Sets the left margin at column *n1* and the right margin at column *n2*. See the preceding commands for margin restrictions and other notes.

Carriage return

MODE	ASCII	Decimal	Hexadecimal
Both	\<CR\>	13	0D

Prints the current line and sets the print position to the left margin. If EDS switch A5 is set to OFF, this command also performs a line feed.

Set automatic line feed

MODE	ASCII	Decimal	Hexadecimal
IBM	\<ESC\> "5" \<1\>	27 53 1	1B 35 01

Causes the printer to perform both a carriage return and line feed each time it receives a \<CR\> code. This command overrides EDS switch A5.

Cancel automatic line feed

MODE	ASCII	Decimal	Hexadecimal
IBM	\<ESC\> "5" \<0\>	27 53 0	1B 35 00

Causes the printer to perform only a carriage return when it receives a \<CR\> code. This command takes priority over EDS switch A5.

Backspace

MODE	ASCII	Decimal	Hexadecimal
Both	\<BS\>	8	08

Moves the print position one column to the left. Ignored if the print position is at the left margin. This command can be used to overstrike or combine characters.

Set horizontal tab stops

MODE	ASCII	Decimal	Hexadecimal
Both	<ESC> "D" *n1* *n2* ... <0>	27 68 *n1* *n2* ... 0	1B 44 *n1* *n2* ...00

Cancels all current horizontal tab stops and sets new tab stops at columns *n1*, *n2*, etc. in the current character pitch (pica pitch if proportional spacing is currently selected), where *n1*, *n2*, etc. are numbers between 1 and 255. The maximum number of horizontal tab stops allowed is 32 in Standard mode and 28 in IBM mode. The tab stops must be specified in ascending order; any violation of ascending order terminates the tab stop list. Standard termination is by the <0> control code. To clear all tab stops, specify <ESC> "D" <0>.

Reset all tab stops

MODE	ASCII	Decimal	Hexadecimal
IBM	<ESC> "R"	27 82	1B 52

Resets the horizontal tab stops to their power-up values in which a tab stop is set every 8 columns starting at column 9. Also clears all vertical tab stops.

Horizontal tab

MODE	ASCII	Decimal	Hexadecimal
Both	<HT>	9	09

Moves the print position to the next horizontal tab stop. Ignored if there is no next horizontal tab stop on the current line. Note that when underlining is selected, spaces skipped by horizontal tabulation are not underlined.

Relative horizontal tab

MODE	ASCII	Decimal	Hexadecimal
Std.	<ESC> "\" n1 n2	27 92 n1 n2	1B 5C n1 n2

Moves the print position right or left a specified distance. Ignored if the resulting position is beyond the right or left margin. The formula for the distance and direction are as follows:

If $n2$ is between 0 and 63, the print head moves right by $(n1 + n2 \times 256)$ dots.

If you want to move the print head to the left, $n1$ and $n2$ are obtained by subtracting the value from 65536, and dividing the result into high and low bytes.

The unit of movement is fixed at 1/120 inch in draft mode and 1/180 inch in LQ mode.

Relative horizontal tab in inches

MODE	ASCII	Decimal	Hexadecimal
IBM	<ESC> "d" n1 n2	27 100 n1 n2	1B 64 n1 n2

Sets the next print position to $(n1 + n2 \times 256)/120$ inches from the current position.

Ignored if this position is beyond the right margin.

The maximum tab position is 8 inches.

Absolute horizontal tab in inches

MODE	ASCII	Decimal	Hexadecimal
Std.	<ESC> "$" n1 n2	27 36 n1 n2	1B 24 n1 n2

Sets the next print position to $(n1 + n2 \times 256)/60$ inches from the left margin on the current line. Ignored if this position is beyond the right margin.

Graphics commands

Print normal-density 8-bit graphics

MODE	ASCII	Decimal	Hexadecimal

Both	`<ESC> "K"  n1`
	`     n2  m1  m2`
	`. . .`
		`27  75  n1`
		`n2 m1 m2`
		`. . .`
			`1B 4B n1`
			`n2 m1 m2`
			`. . .`

Prints bit-image graphics at 60 dots per inch horizontally. The graphic image is 8 dots high and ($n1 + n2 \times$ 256) dots wide. Maximum width is 8 inches (480 dots). $m1$, $m2$, ... are the dot data, each a 1-byte value from 0 to 255 representing 8 vertical dots, with the most significant bit at the top and the least significant bit at the bottom. The number of data bytes must be $n1 + n2 \times$ 256. Dots beyond the right margin are ignored. On completion of bit-image printing the printer returns automatically to character mode.

Print double-density 8-bit graphics

MODE	ASCII	Decimal	Hexadecimal

Both	`<ESC> "L"  n1`
	`     n2  m1  m2`
	`. . .`
		`27  76  n1`
		`n2 m1 m2`
		`. . .`
			`1B 4C n1`
			`n2 m1 m2`
			`. . .`

Prints bit-image graphics at 120 dots per inch horizontally (maximum 960 dots wide). See the <ESC> "K" command for other information.

Print double-density, double-speed 8-bit graphics

MODE	ASCII	Decimal	Hexadecimal

Both	`<ESC> "Y"  n1`
	`     n2  m1  m2`
	`. . .`
		`27  89  n1`
		`n2 m1 m2`
		`. . .`
			`1B 59 n1`
			`n2 m1 m2`
			`. . .`

Prints bit-image graphics at 120 dots per inch horizontally (maximum 960 dots wide), skipping every second dot in the horizontal direction. See the <ESC> "K" command for other information.

Print quadruple-density 8-bit graphics

MODE	ASCII	Decimal	Hexadecimal
Both	<ESC> "Z" n1 n2 m1 m2 . . .	27 90 n1 n2 m1 m2 . . .	1B 5A n1 n2 m1 m2 . . .

Prints bit-image graphics at 240 dots per inch horizontally (maximum 1920 dots wide), skipping every second dot in the horizontal direction. See the <ESC> "K" command for other information.

Print hex-density 24-bit graphics

MODE	ASCII	Decimal	Hexadecimal
Std.	<FS> "Z" n1 n2 m1 m2 m3 . . .	28 90 n1 n2 m1 m2 m3 . . .	1C 5A n1 n2 m1 m2 m3 . . .

Prints 24-bit dot graphics at 360 dots per inch horizontally. The graphics image is 24 dots high and $n1 + n2 \times 256$ dots wide. Maximum width is 8 inches (2880 dots). In the data $m1$, $m2$, $m3$ ... each three bytes represent 24 vertical dots. In the leftmost position, the most significant bit of $m1$ is the top dot; the least significant bit of $m1$ is the eighth dot from the top; the most significant bit of $m2$ is the ninth dot; the least significant bit of $m2$ is the sixteenth dot from the top; the most significant bit of $m3$ is the seventeenth dot from the top; the least significant bit of $m3$ is the bottom dot. The rest of the data is organized in the same way. The number of data bytes must be $3 \times (n1 + n2 \times 256)$. Dots beyond the right margin are ignored. On completion of dot graphics printing, the printer returns automatically to character mode.

Select graphics mode

MODE	ASCII	Decimal	Hexadecimal

Std.	`<ESC> "*"  n0`
	`   n1   n2   m1`
	`   m2   ...`
		`27 42 n0`
		`n1 n2 m1`
		`m2 ...`
			`1B 2A n0`
			`n1 n2 m1`
			`m2 ...`

Selects one of eleven graphics modes depending on the value of *n0* and prints bit-image graphics in this mode. See the <ESC> "K" command (for 8-bit graphics) or the <FS> "Z" command (for 24-bit graphics) for information on *n1*, *n2*, *m1*, *m2*, etc.

n0	Graphics mode	
0	8-bit Normal-density	(60 dots per inch)
1	8-bit Double-density	(120 dots per inch)
2	8-bit Double-density, double-speed	(120 dots per inch)
3	8-bit Quadruple-density	(240 dots per inch)
4	8-bit CRT graphics, mode I	(80 dots per inch)
6	8-bit CRT graphics, mode II	(90 dots per inch)
32	24-bit Normal-density	(60 dots per inch)
33	24-bit Double-density	(120 dots per inch)
38	24-bit CRT graphics	(90 dots per inch)
39	24-bit Triple-density	(180 dots per inch)
40	24-bit Hex-density	(360 dots per inch)

Select graphics mode

MODE	ASCII	Decimal	Hexadecimal
IBM	\<ESC\> " [" "g" n1 n2 m0 m1 m2 . . .	27 91 103 n1 n2 m0 m1 m2 . . .	1B 5B 67 n1 n2 m0 m1 m2 . . .

Selects one of eight graphics modes depending on the value of *m0* and prints bit-image graphics in this mode. The graphics image is (*n1* + *n2* × 256) − 1 dots wide. See the \<ESC\> "K" command (for 8-bit graphics) or the \<FS\> "Z" command (for 24-bit graphics) for information on *m1*, *m2*, etc.

m0	Graphics mode	
0	8-bit Normal-density	(60 dots per inch)
1	8-bit Double-density	(120 dots per inch)
2	8-bit Double-density, double-speed	(120 dots per inch)
3	8-bit Quadruple-density	(240 dots per inch)
8	24-bit Normal-density	(60 dots per inch)
9	24-bit Double-density	(120 dots per inch)
11	24-bit Triple-density	(180 dots per inch)
12	24-bit Hex-density	(360 dots per inch)

Convert graphics density

MODE	ASCII	Decimal	Hexadecimal
Std.	\<ESC\> "?" n m	27 63 n m	1B 3F n m

Converts graphics defined by subsequent \<ESC\> "K", \<ESC\> "L", \<ESC\> "Y" or \<ESC\> "Z" commands to a density mode defined by \<ESC\> "*". *n* is "K", "L", "Y" or "Z", indicating the mode to be converted. *m* is a code from \<0\> to \<4\> or \<6\> indicating one of the modes of \<ESC\> "*".

Download character commands

Define download characters

MODE	ASCII			Decimal	Hexadecimal
Std.	`<ESC>` `"&"` `<0>`			`27  38  0`	`1B  26  00`
	`n1`	`n2`	`m0`	`n1  n2  m0`	`n1  n2  m0`
	`m1`	`m2`	`d1`	`m1  m2  d1`	`m1  m2  d1`
	`d2`	`...`	`dx`	`d2...  dx`	`d2...  dx`

Defines one or more new characters and stores them in RAM for later use. EDS switch A3 must be set to OFF; otherwise RAM is used as an input buffer only, not for storing downloaded characters, and this command is ignored.

n1 is the character code of the first character to be defined and *n2* is the character code of the last character to be defined. *n1* must be equal to or less than *n2*.

The data for each character starts with three bytes specifying proportional spacing attributes: the first byte, *m0*, specifies the left of the character; the second byte, *m1*, specifies the character width; the third byte, *m2*, specifies the right of the character.

These values must not exceed the following maximum limits:

Character mode	*m1*	*m0 + m1 + m2*
Draft	9	12
LQ pica	31	36
LQ elite	27	30
LQ semi-condensed	19	24
LQ proportional	37	42
Draft super/subscript	7	12
LQ super/subscript	19	36
LQ prop. super/subscript	37	42

Next comes the dot data. Normal character height is 24 dots, so there must be $3 \times m1$ bytes of dot data. If the printer is in super/subscript mode, however, the character height is 16 dots, so there must be $2 \times m1$ bytes of dot data.

Each data byte represents eight vertical dots, with the most significant bit representing the top dot, and the least significant bit representing the bottom dot.

Select download character set

MODE	ASCII	Decimal	Hexadecimal
Std.	⟨ESC⟩ "%" ⟨1⟩	27 37 1	1B 25 01

Selects the download character set. Ignored when EDS switch A3 is ON.

Select ROM character set

MODE	ASCII	Decimal	Hexadecimal
Std.	⟨ESC⟩ "%" ⟨0⟩	27 37 0	1B 25 00

Stops using the download character set and returns to the built-in ROM character set. Ignored when EDS switch A3 is ON.

Other printer commands

Select print color

MODE	ASCII	Decimal	Hexadecimal
Both	<ESC> "r" n	27 114 n	1B 72 n

Selects the printing color according to the value of n as shown below. Ignored if EDS switch A4 is OFF, EDS switch B3 is OFF, or if a color ribbon is not installed.

n	Color	n	Color
0	Black	4	Yellow
1	Magenta	5	Orange
2	Cyan	6	Green
3	Violet		

Set MSB to 1

MODE	ASCII	Decimal	Hexadecimal
Std.	<ESC> ">"	27 62	1B 3E

Sets the most significant bit of each subsequent byte received to 1, allowing users with a 7-bit interface to access characters with ASCII codes greater than 127.

Set MSB to 0

MODE	ASCII	Decimal	Hexadecimal
Std.	<ESC> "="	27 61	1B 3D

Sets the most significant bit of each subsequent byte received to 0.

Accept MSB as is

MODE	ASCII	Decimal	Hexadecimal
Std.	<ESC> "#"	27 35	1B 23

Cancels the preceding commands and accepts the most significant bit as it is when it is sent to the printer.

Delete last character sent

MODE	ASCII	Decimal	Hexadecimal
Std.	<DEL>	127	7F

Deletes the last character received. Ignored if the last character received has already been printed, or if the last character received was part of a command.

Cancel last line

MODE	ASCII	Decimal	Hexadecimal
Both	<CAN>	24	18

Deletes the last line currently in the print buffer.

Set printer off-line

MODE	ASCII	Decimal	Hexadecimal
Std.	<DC3>	19	13
IBM	<ESC> "Q" "S"	27 81 36	1B 51 24

Sets the printer off-line (into **not-ready mode**). The printer disregards all subsequent characters and commands except <DC1>, which puts it back on-line (into **ready mode**). The printer's READY indicator will not go off.

Set printer on-line

MODE	ASCII	Decimal	Hexadecimal
Both	<DC1>	17	11

Puts the printer back on-line (into **ready mode**), allowing it to receive and process all subsequent characters and commands. This command is ignored if the printer was set off-line (into **not-ready mode**) by pressing the (READY) key on the control panel.

Stop printing

MODE	ASCII	Decimal	Hexadecimal
IBM	\<ESC> "j"	27 106	1B 6A

Prints the entire contents of the input buffer, then sets the printer off-line (into **not-ready mode**). The READY indicator on the control panel will go off.

Bell

MODE	ASCII	Decimal	Hexadecimal
Both	\<BEL>	7	07

Sounds a brief beep tone on the printer.

Bi-directional printing

MODE	ASCII	Decimal	Hexadecimal
Both	\<ESC> "U" \<0>	27 85 0	1B 55 00

Causes subsequent printing to be performed in the normal bi-directional mode, which is faster than uni-directional printing.

Uni-directional printing

MODE	ASCII	Decimal	Hexadecimal
Both	\<ESC> "U" \<1>	27 85 1	1B 55 01

Causes subsequent printing to be performed uni-directionally, ensuring maximum vertical alignment precision.

One-line uni-directional printing

MODE	ASCII	Decimal	Hexadecimal
Std.	\<ESC> "\<"	27 60	1B 3C

Immediately returns the print head to the left margin, then prints the remainder of the line from left to right. Normal bi-directional printing resumes on the next line.

Manual feed

MODE	ASCII	Decimal	Hexadecimal
Both	\<ESC\> \<EM\> \<0\>	27 25 0	1B 19 00

Selects manual sheet feeding even when the paper tray is in use.

Auto feed

MODE	ASCII	Decimal	Hexadecimal
Both	\<ESC\> \<EM\> \<4\>	27 25 4	1B 19 04

Selects automatic sheet feeding from the paper tray.

Eject paper

MODE	ASCII	Decimal	Hexadecimal
Both	\<ESC\> \<EM\> "R"	27 25 82	1B 19 52

Ejects the current page.

Set print start position on paper tray feeding

MODE	ASCII	Decimal	Hexadecimal
Both	\<ESC\> \<EM\> "T" n	27 25 84 n	1B 19 54 n

Skips $n/6$ inches at the top of the page, where n is equal to or greater than 1.

Reset printer

MODE	ASCII	Decimal	Hexadecimal
Both	\<ESC\> "@"	27 64	1B 40
Std.	\<FS\> "@"	28 64	1C 40

Re-initializes the printer. Clears the print buffer and returns settings to their power-up values. Does not clear the input buffer.

Set initial conditions

MODE	ASCII	Decimal	Hexadecimal
IBM	`<ESC> "[" "K" <3>`	`27 91 75 3`	`1B 5B 4B 03`
	`<0>  <0> <3>   n`	` 0  0  3 n`	`00 00 03 n`

Re-initializes the printer to the initial conditions determined by the value of n.

The value of n is the sum of the values given below for the desired characteristics.

Function	n value	Function	n value
Disable alarm	3 2	12-inch forms	4
Auto CR with LF	1 6	Slashed zero	2
Auto LF with CR	8	Character set #2	1

Appendix

Specifications

Printing system	Serial Impact Dot-matrix		
Printing speed	10 cpi (Pica)	12 cpi (Elite)	15 cpi (Semi-condensed)
Draft	160 cps	192 cps	240 cps
Letter Quality	53 cps	64 cps	80 cps

Print direction   Bi-directional, logic-seeking
                   Uni-directional, logic-seeking
                   (selectable)

Print head   24 pins
   Life   100 million dots/pin

Line spacing   1/6, 1/8, $n/60$, $n/72$, $n/180$,
                   $n/216$, $n/360$ inches

Typeface   Draft, Roman, Sanserif, Courier,
families   Prestige, Script

Characters	ASCII	96
	International	16 sets (*)
	IBM special	111
	IBM block graphic	50
	IBM code page	6 sets (**)
	Download	120

* USA, France, Germany, England, Denmark I, Sweden, Italy, Spain I, Japan, Norway, Denmark II, Spain II, Latin America, Korea, Irish, Legal

** #437 (USA), #850 (Multi-Lingual), #860 (Portuguese), #861 (Icelandic), #863 (Canadian French), #865 (Nordic)

Number of columns

	Pica (10 CPI)	80
	Elite (12 CPI)	96
	Semi-condensed (15 CPI)	120
	Condensed pica (17 CPI)	137
	Condensed elite (20 CPI)	160
	Proportional	Variable

Character matrix	Draft	LQ
Pica	24×9	24×31
Elite	24×9	24×27
Semi-condensed	16×7	16×21
Condensed pica	24×9	24×16
Condensed elite	24×9	24×16
Proportional		$24 \times n$

Bit image dot-matrix

8-pin normal (60 DPI)	8×480
8-pin double (120 DPI)	8×960
8-pin high-speed double (120 DPI)*	8×960
8-pin quadruple (240 DPI)*	8×1920
8-pin CRT I (80 DPI)	8×640
8-pin CRT II (90 DPI)	8×720
24-pin normal (60 DPI)	24×480
24-pin double (120 DPI)	24×960
24-pin CRT III (90 DPI)	24×720
24-pin Triple (180 DPI)	24×1440
24-pin Hex (360 DPI)*	24×2880

*. It is impossible to print adjacent dots in modes marked with an asterisk (*).

Paper feed

Standard	Friction feed with paper tray
Option	Push tractor feed

Paper feed speed   2.9 inches/second maximum

Paper specifications

Cut sheet

Width	5.8" - 11.0" (148 - 279.4 mm)
Length	5.5" - 14.0" (139.7 - 355.6 mm)
Thickness	0.08 - 0.12 mm
Weight	16 - 24 lb, 60 - 90 g/m², 52 - 77 kg

Fanfold (continuous)

Width	4.0" - 10.0" (101.6 - 254.0 mm)
Length	Minimum 5.5" (139.7 mm)
Thickness	Single-ply paper 0.07 - 0.12 mm
	Total for multi-part forms 0.25 mm
Weight	14 - 22 lb, 52 - 82 g/m², 45 - 70 kg
Copies	Original + 2 copies

Maximum buffer size
>   Without Download   15.0 kB
>   With Download   512 bytes

Emulations
>   Standard mode   Epson LQ-860/850, NEC 24-wire
>   graphics commands
>   IBM mode   IBM Proprinter X24E

Interface   Centronics parallel (standard)
>   RS-232C serial (option)

Ribbon type   On-carriage, dedicated
>   Monochrome   (black only)
>   Color   (black, magenta, cyan, violet,
>   yellow, orange, green)

Ribbon life
>   Monochrome (Y24W)   2.5 million characters (draft
>   pica)
>   Color (Y24CL)   0.4 million characters/color
>   (draft pica)

Dimensions and Weight
>   Width   386 mm (15.2")
>   Depth   275 mm (10.8")
>   Height   195 mm (7.67")
>   Weight   6.4 kg (14.1 lb)

Power supply   120VAC, 220VAC, 230VAC, 240VAC,
>   50/60 Hz
>   (varies according to the country of
>   purchase)

Options   Push Tractor Unit (PT-10Q)
>   Serial-Parallel Converter (SPC-8K)

Default Electronic DIP Switch settings

EDS setting	Function	Default setting
A1	Emulation	Standard/Epson (ON)
A2	AEC (Automatic Emulation Change) Mode	Enabled (ON)
A3	RAM usage	Input buffer (ON)
A4	Color and Zoom	Enabled (ON)
A5	Auto LF with CR	Disabled (ON)
B1	Graphics direction	Uni-directional (OFF)
B2	Paper-out detection	Enabled (ON)
B3	Ink Ribbon Type	Color (ON)
B4	Reserved	ON
B5	Time-out printing	Enabled (ON)
C1, C2, C3	Page length	Letter (all 3 switches ON)
C4, C5	Print pitch	10 cpi (both switches ON)
D1	Print mode	Letter Quality (ON)
D2	Character table Standard mode IBM mode	Graphics (ON) Set #2 (ON)
D3, D4, D5	IBM code page or International character set Standard mode graphic character set Standard mode italic character set IBM mode	Code page #437 (U.S.A.) U.S.A. character set Code page #437 (U.S.A.) (all 3 switches ON)
E1, E2, E3	LQ font selection	Roman (all 3 switches ON)
E4, E5	Reserved	Both switches ON

Printer beep tones

The printer beeps both to warn you that something is wrong and to indicate various aspects of normal operation, for example, to indicate that a particular setting or selection has just been made. The table below gives a full list of printer beeps and their meanings

Tone sequence	Meaning
Single tone lasting 2 seconds	The printer has detected an error condition. Switch the printer off and on again.
Single tone lasting several seconds	The printer has detected an error condition. Switch the printer off and on again.
Four short tones, repeated twice	The printer is out of paper
Single short tone	One of the following: • Vertical alignment mode has been selected • Zoom resolution has been set to 50% • Quiet mode has been selected • Electronic DIP Switch mode has been selected
Two short tones	One of the following: • Macro (saved settings) mode has been selected • Zoom resolution has been set to 67% • Quiet mode has been cancelled
Three short tones	Macro (saved settings) mode has been cancelled
Single quarter tone	One of the following: • Hexadecimal dump mode has been selected • Prevention of software font selection has been selected • Zoom resolution has been set to 100% (i.e. zoom is cancelled).

Interface pin outs

Parallel interface

Pin	Name	Function
1	STROBE	Goes low for $\geq 0.5\mu s$ when active
2	DATA0	High when active
3	DATA1	High when active
4	DATA2	High when active
5	DATA3	High when active
6	DATA4	High when active
7	DATA5	High when active
8	DATA6	High when active
9	DATA7	High when active
10	ACK	$5\mu s$ to acknowledge receipt of data
11	BUSY	Printer sets line low when ready to receive data.
12	PAPER	High when paper runs out. Can be disabled with EDS setting.
13	SELECT	High when printer is on-line
14-15		Not connected
16	SIGNAL GND	Signal ground
17	CHASSIS	Chassis ground (isolated from signal ground)
18	+5V	+5V DC output from printer
19-30	GND	Twisted pair ground return
31	RESET	When this signal is set low, the printer is reset.
32	ERROR	Low when printer cannot continue due to an error
33	EXT GND	External ground
34-35		Not connected
36	SELECT IN	Always high

Serial interface

Pin	Name	Function
1	GND	Printer chassis ground
2	TXD	Data from printer
3	RXD	Data to printer
4	RTS	Always low
5	CTS	Low when the computer is ready to transmit data Printer ignores this signal
6		Not connected
7	GND	Signal ground
8-10		Not connected
11	RCH	Printer sets line low when ready to receive data. Same signal as pin 20
12-19		Not connected
20	DTR	Printer sets line low when ready to receive data.
21-25		Not connected

Character sets

The following tables show the Standard and IBM character sets. Also shown are the IBM code pages (international variations of IBM character set #2) and the standard (Epson) mode international character sets (international variations of the Epson Standard character set).

The decimal character code for each character is shown in an inset at the bottom right of the character.

The hexadecimal character code for a character can be found by reading the hexadecimal column and row numbers, which are at the top and on the left of the table. For example, the character "A" is in column 4 and row 1, so its hexadecimal character code is 41. This is equivalent to decimal 65 (4 × 16 + 1 = 65), which is the decimal number shown in the inset.

Control codes are indicated by abbreviations in angle brackets, e.g. <LF>.

Standard character set #2

	0	1	2	3	4	5	6	7
0	⟨NUL⟩ 0	16	32	0 48	@ 64	P 80	` 96	p 112
1	1	⟨DC1⟩ 17	! 33	1 49	A 65	Q 81	a 97	q 113
2	2	⟨DC2⟩ 18	" 34	2 50	B 66	R 82	b 98	r 114
3	3	⟨DC3⟩ 19	# 35	3 51	C 67	S 83	c 99	s 115
4	4	⟨DC4⟩ 20	$ 36	4 52	D 68	T 84	d 100	t 116
5	5	21	% 37	5 53	E 69	U 85	e 101	u 117
6	6	⟨SYN⟩ 22	& 38	6 54	F 70	V 86	f 102	v 118
7	⟨BEL⟩ 7	23	' 39	7 55	G 71	W 87	g 103	w 119
8	⟨BS⟩ 8	⟨CAN⟩ 24	(40	8 56	H 72	X 88	h 104	x 120
9	⟨HT⟩ 9	⟨EM⟩ 25	) 41	9 57	I 73	Y 89	i 105	y 121
A	⟨LF⟩ 10	26	* 42	: 58	J 74	Z 90	j 106	z 122
B	⟨VT⟩ 11	⟨ESC⟩ 27	+ 43	; 59	K 75	[91	k 107	{ 123
C	⟨FF⟩ 12	⟨FS⟩ 28	, 44	< 60	L 76	\ 92	l 108	¦ 124
D	⟨CR⟩ 13	29	— 45	= 61	M 77	] 93	m 109	} 125
E	⟨SO⟩ 14	30	. 46	> 62	N 78	^ 94	n 110	~ 126
F	⟨SI⟩ 15	31	/ 47	? 63	O 79	_ 95	o 111	⟨DEL⟩ 127

Standard character set #2 (continued)

	8	9	A	B	C	D	E	F
0	à 128	§ 144	160	0 176	@ 192	P 208	` 224	p 240
1	è 129	ß 145	! 161	1 177	A 193	Q 209	a 225	q 241
2	ù 130	Æ 146	" 162	2 178	B 194	R 210	b 226	r 242
3	ò 131	æ 147	# 163	3 179	C 195	S 211	c 227	s 243
4	ì 132	Ø 148	$ 164	4 180	D 196	T 212	d 228	t 244
5	° 133	ø 149	% 165	5 181	E 197	U 213	e 229	u 245
6	£ 134	¨ 150	& 166	6 182	F 198	V 214	f 230	v 246
7	ï 135	Å 151	' 167	7 183	G 199	W 215	g 231	w 247
8	¿ 136	Ö 152	(168	8 184	H 200	X 216	h 232	x 248
9	Ñ 137	Ü 153	) 169	9 185	I 201	Y 217	i 233	y 249
A	ñ 138	ä 154	* 170	: 186	J 202	Z 218	j 234	z 250
B	¤ 139	ö 155	+ 171	; 187	K 203	[219	k 235	{ 251
C	₧ 140	ü 156	, 172	< 188	L 204	\ 220	l 236	¦ 252
D	Á 141	Æ 157	- 173	= 189	M 205	] 221	m 237	} 253
E	å 142	é 158	. 174	> 190	N 206	^ 222	n 238	~ 254
F	ç 143	¥ 159	/ 175	? 191	O 207	_ 223	o 239	255

International character sets

The character codes shown are in decimal.

Country	35	36	64	88	90	91	92	93	94	96	123	124	125	126
U.S.A.	#	$	@	X	Z	[	\	]	^	`	{	|	}	~
FRANCE	#	$	à	X	Z	°	ç	§	^	`	é	ù	è	¨
GERMANY	#	$	§	X	Z	Ä	Ö	Ü	^	`	ä	ö	ü	ß
ENGLAND	£	$	@	X	Z	[	\	]	^	`	{	|	}	~
DENMARK I	#	$	@	X	Z	Æ	Ø	Å	^	`	æ	ø	å	~
SWEDEN	#	¤	É	X	Z	Ä	Ö	Å	Ü	é	ä	ö	å	ü
ITALY	#	$	@	X	Z	°	\	é	^	ù	à	ò	è	ì
SPAIN I	₧	$	@	X	Z	¡	Ñ	¿	^	´	¨	ñ	}	~
JAPAN	#	$	@	X	Z	[	¥	]	^	`	{	|	}	~
NORWAY	#	¤	É	X	Z	Æ	Ø	Å	Ü	é	æ	ø	å	ü
DENMARK II	#	$	É	X	Z	Æ	Ø	Å	Ü	é	æ	ø	å	ü
SPAIN II	#	$	á	X	Z	¡	Ñ	¿	é	´	í	ñ	ó	ú
LATIN AMERICA	#	$	á	X	Z	¡	Ñ	¿	é	ü	í	ñ	ó	ú
KOREA	#	$	@	X	Z	[	₩	]	^	`	{	|	}	~
IRISH	#	$	@	Ú	´	[	\	]	^	`	Á	É	Ó	~
LEGAL	#	$	§	X	Z	°	'	"	¶	`	©	®	†	™

IBM character set #2

Code page #437 (U.S.A.)

	0	1	2	3	4	5	6	7
0	<NUL> 0	16	32	0 48	@ 64	P 80	` 96	p 112
1	1	<DC1> 17	! 33	1 49	A 65	Q 81	a 97	q 113
2	2	<DC2> 18	" 34	2 50	B 66	R 82	b 98	r 114
3	♥ 3	<DC3> 19	# 35	3 51	C 67	S 83	c 99	s 115
4	♦ 4	<DC4> 20	$ 36	4 52	D 68	T 84	d 100	t 116
5	♣ 5	§ 21	% 37	5 53	E 69	U 85	e 101	u 117
6	♠ 6	<SYN> 22	& 38	6 54	F 70	V 86	f 102	v 118
7	<BEL> 7	23	' 39	7 55	G 71	W 87	g 103	w 119
8	<BS> 8	<CAN> 24	(40	8 56	H 72	X 88	h 104	x 120
9	<HT> 9	<EM> 25	) 41	9 57	I 73	Y 89	i 105	y 121
A	<LF> 10	26	* 42	: 58	J 74	Z 90	j 106	z 122
B	<VT> 11	<ESC> 27	+ 43	; 59	K 75	[91	k 107	{ 123
C	<FF> 12	<FS> 28	, 44	< 60	L 76	\ 92	l 108	¦ 124
D	<CR> 13	29	- 45	= 61	M 77	] 93	m 109	} 125
E	<SO> 14	30	. 46	> 62	N 78	^ 94	n 110	~ 126
F	<SI> 15	31	/ 47	? 63	O 79	_ 95	o 111	<DEL> 127

	8	9	A	B	C	D	E	F
0	Ç 128	É 144	á 160	░ 176	└ 192	╨ 208	α 224	≡ 240
1	ü 129	æ 145	í 161	▒ 177	┴ 193	╤ 209	β 225	± 241
2	é 130	Æ 146	ó 162	▓ 178	┬ 194	π 210	Γ 226	≥ 242
3	â 131	ô 147	ú 163	│ 179	├ 195	╙ 211	π 227	≤ 243
4	ä 132	ö 148	ñ 164	┤ 180	─ 196	╘ 212	Σ 228	⌠ 244
5	à 133	ò 149	Ñ 165	╡ 181	┼ 197	╒ 213	σ 229	⌡ 245
6	å 134	û 150	ª 166	╢ 182	╞ 198	π 214	µ 230	÷ 246
7	ç 135	ù 151	º 167	╖ 183	╟ 199	╫ 215	τ 231	≈ 247
8	ê 136	ÿ 152	¿ 168	╕ 184	╚ 200	╪ 216	Φ 232	° 248
9	ë 137	Ö 153	⌐ 169	╣ 185	╔ 201	┘ 217	Θ 233	∙ 249
A	è 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Ω 234	· 250
B	ï 139	¢ 155	½ 171	╗ 187	╦ 203	█ 219	δ 235	√ 251
C	î 140	£ 156	¼ 172	╝ 188	╠ 204	▄ 220	∞ 236	ⁿ 252
D	ì 141	¥ 157	¡ 173	╜ 189	= 205	▌ 221	ø 237	² 253
E	Ä 142	₧ 158	« 174	╛ 190	╬ 206	▐ 222	ε 238	■ 254
F	Å 143	ƒ 159	» 175	┐ 191	╧ 207	▀ 223	∩ 239	255

Code page #850 (Multi-lingual)

The other characters are the same as in code page #437.

	8	9	A	B	C	D	E	F
0	Ç 128	É 144	á 160	░ 176	└ 192	ð 208	Ó 224	- 240
1	ü 129	æ 145	í 161	▒ 177	┴ 193	Ð 209	ß 225	± 241
2	é 130	Æ 146	ó 162	▓ 178	┬ 194	Ê 210	Ô 226	= 242
3	â 131	ô 147	ú 163	│ 179	├ 195	Ë 211	Ò 227	¾ 243
4	ä 132	ö 148	ñ 164	┤ 180	─ 196	È 212	õ 228	¶ 244
5	à 133	ò 149	Ñ 165	Á 181	┼ 197	ı 213	Õ 229	§ 245
6	å 134	û 150	ª 166	Â 182	ã 198	Í 214	µ 230	÷ 246
7	ç 135	ù 151	º 167	À 183	Ã 199	Î 215	þ 231	¸ 247
8	ê 136	ÿ 152	¿ 168	© 184	╚ 200	Ï 216	Þ 232	° 248
9	ë 137	Ö 153	® 169	╣ 185	╔ 201	┘ 217	Ú 233	¨ 249
A	è 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Û 234	· 250
B	ï 139	ø 155	½ 171	╗ 187	╦ 203	█ 219	Ù 235	¹ 251
C	î 140	£ 156	¼ 172	╝ 188	╠ 204	▄ 220	ý 236	³ 252
D	ì 141	Ø 157	¡ 173	¢ 189	= 205	¦ 221	Ý 237	² 253
E	Ä 142	× 158	« 174	¥ 190	╬ 206	Ì 222	¯ 238	■ 254
F	Å 143	ƒ 159	» 175	┐ 191	¤ 207	▀ 223	´ 239	255

Code page #860 (Portuguese)

The other characters are the same as in code page #437.

	8	9	A	B	C	D	E	F
0	Ç 128	É 144	á 160	░ 176	└ 192	╨ 208	α 224	≡ 240
1	ü 129	À 145	í 161	▒ 177	┴ 193	╤ 209	β 225	± 241
2	é 130	È 146	ó 162	▓ 178	┬ 194	π 210	Γ 226	≥ 242
3	â 131	Ô 147	ú 163	│ 179	├ 195	╙ 211	π 227	≤ 243
4	ã 132	õ 148	ñ 164	┤ 180	─ 196	╘ 212	Σ 228	⌠ 244
5	à 133	ò 149	Ñ 165	╡ 181	┼ 197	╒ 213	σ 229	⌡ 245
6	Á 134	Ú 150	ª 166	╢ 182	╞ 198	π 214	µ 230	÷ 246
7	ç 135	ù 151	º 167	╖ 183	╟ 199	╫ 215	τ 231	≈ 247
8	ê 136	Ì 152	¿ 168	╕ 184	╚ 200	╪ 216	Φ 232	° 248
9	Ê 137	Õ 153	Ò 169	╣ 185	╔ 201	┘ 217	Θ 233	∙ 249
A	è 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Ω 234	· 250
B	Í 139	¢ 155	½ 171	╗ 187	╦ 203	█ 219	δ 235	√ 251
C	Ô 140	£ 156	¼ 172	╝ 188	╠ 204	▄ 220	∞ 236	n 252
D	ì 141	Ù 157	¡ 173	╜ 189	═ 205	▌ 221	ø 237	² 253
E	Ã 142	₧ 158	« 174	╛ 190	╬ 206	▐ 222	ε 238	■ 254
F	Â 143	Ó 159	» 175	┐ 191	╧ 207	▀ 223	∩ 239	255

Code page #861 (Icelandic)

The other characters are the same as in code page #437.

	8	9	A	B	C	D	E	F
0	Ç 128	É 144	á 160	░ 176	└ 192	╨ 208	α 224	≡ 240
1	ü 129	æ 145	í 161	▒ 177	┴ 193	╤ 209	β 225	± 241
2	é 130	Æ 146	ó 162	▓ 178	┬ 194	╥ 210	Γ 226	≥ 242
3	â 131	ô 147	ú 163	│ 179	├ 195	╙ 211	π 227	≤ 243
4	ä 132	ö 148	Á 164	┤ 180	─ 196	╘ 212	Σ 228	⌠ 244
5	à 133	þ 149	Í 165	╡ 181	┼ 197	╒ 213	σ 229	⌡ 245
6	å 134	û 150	Ó 166	╢ 182	╞ 198	π 214	μ 230	÷ 246
7	ç 135	Ý 151	Ú 167	╖ 183	╟ 199	╫ 215	τ 231	≈ 247
8	ê 136	ý 152	¿ 168	╕ 184	╚ 200	╪ 216	Φ 232	° 248
9	ë 137	Ö 153	⌐ 169	╣ 185	╔ 201	┘ 217	Θ 233	∙ 249
A	è 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Ω 234	· 250
B	Ð 139	ø 155	½ 171	╗ 187	╦ 203	█ 219	δ 235	√ 251
C	ð 140	£ 156	¼ 172	╝ 188	╠ 204	▄ 220	∞ 236	ⁿ 252
D	Þ 141	Ø 157	¡ 173	╜ 189	═ 205	▌ 221	φ 237	² 253
E	Ä 142	₧ 158	« 174	╛ 190	╬ 206	▐ 222	ε 238	■ 254
F	Å 143	ƒ 159	» 175	┐ 191	╧ 207	▀ 223	∩ 239	255

Code page #863 (Canadian French)

The other characters are the same as in code page #437.

	8	9	A	B	C	D	E	F
0	Ç 128	É 144	¦ 160	▓ 176	└ 192	╨ 208	α 224	≡ 240
1	ü 129	È 145	´ 161	▒ 177	┴ 193	╤ 209	β 225	± 241
2	é 130	Ê 146	ó 162	▓ 178	┬ 194	╥ 210	Γ 226	≥ 242
3	â 131	ô 147	ú 163	│ 179	├ 195	╙ 211	π 227	≤ 243
4	Â 132	Ë 148	¨ 164	┤ 180	─ 196	╘ 212	Σ 228	⌠ 244
5	à 133	Ï 149	¸ 165	╡ 181	┼ 197	╒ 213	σ 229	⌡ 245
6	¶ 134	û 150	³ 166	╢ 182	╞ 198	╓ 214	µ 230	÷ 246
7	ç 135	ù 151	― 167	╖ 183	╟ 199	╫ 215	τ 231	≈ 247
8	ê 136	¤ 152	Î 168	╕ 184	╚ 200	╪ 216	Φ 232	° 248
9	ë 137	Ô 153	⌐ 169	╣ 185	╔ 201	┘ 217	Θ 233	∙ 249
A	è 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Ω 234	· 250
B	ï 139	¢ 155	½ 171	╗ 187	╦ 203	█ 219	δ 235	√ 251
C	î 140	£ 156	¼ 172	╝ 188	╠ 204	▄ 220	∞ 236	ⁿ 252
D	= 141	Û 157	¾ 173	╜ 189	= 205	▌ 221	φ 237	² 253
E	À 142	Û 158	« 174	╛ 190	╬ 206	▐ 222	ε 238	■ 254
F	§ 143	ƒ 159	» 175	┐ 191	╧ 207	▀ 223	∩ 239	255

The other characters are the same as in code page #437.

	8	9	A	B	C	D	E	F
0	Ç [128]	É [144]	á [160]	░ [176]	└ [192]	╨ [208]	α [224]	≡ [240]
1	ü [129]	æ [145]	í [161]	▒ [177]	┴ [193]	╤ [209]	β [225]	± [241]
2	é [130]	Æ [146]	ó [162]	▓ [178]	┬ [194]	π [210]	Γ [226]	≥ [242]
3	â [131]	ô [147]	ú [163]	│ [179]	├ [195]	╙ [211]	π [227]	≤ [243]
4	ä [132]	ö [148]	ñ [164]	┤ [180]	─ [196]	╘ [212]	Σ [228]	⌠ [244]
5	à [133]	ò [149]	Ñ [165]	╡ [181]	┼ [197]	╒ [213]	σ [229]	⌡ [245]
6	å [134]	û [150]	ª [166]	╢ [182]	╞ [198]	π [214]	µ [230]	÷ [246]
7	ç [135]	ù [151]	Ω [167]	╖ [183]	╟ [199]	╫ [215]	τ [231]	≈ [247]
8	ê [136]	ÿ [152]	¿ [168]	╕ [184]	╚ [200]	╪ [216]	Φ [232]	° [248]
9	ë [137]	Ö [153]	⌐ [169]	╣ [185]	╔ [201]	┘ [217]	Θ [233]	∙ [249]
A	è [138]	Ü [154]	¬ [170]	║ [186]	╩ [202]	┌ [218]	Ω [234]	· [250]
B	ï [139]	ø [155]	½ [171]	╗ [187]	╦ [203]	█ [219]	δ [235]	√ [251]
C	î [140]	£ [156]	¼ [172]	╝ [188]	╠ [204]	▄ [220]	∞ [236]	ⁿ [252]
D	ì [141]	Ø [157]	¡ [173]	╜ [189]	= [205]	▌ [221]	φ [237]	² [253]
E	Ä [142]	₧ [158]	« [174]	╛ [190]	╬ [206]	▐ [222]	ε [238]	■ [254]
F	Å [143]	ƒ [159]	¤ [175]	┐ [191]	╧ [207]	▀ [223]	∩ [239]	[255]

Character set #1

The other characters are the same as in each version of character set #2.

	0	1
0	⟨NUL⟩ 0	16
1	1	⟨DC1⟩ 17
2	2	⟨DC2⟩ 18
3	3	⟨DC3⟩ 19
4	4	⟨DC4⟩ 20
5	5	21
6	6	⟨SYN⟩ 22
7	⟨BEL⟩ 7	23
8	⟨BS⟩ 8	⟨CAN⟩ 24
9	⟨HT⟩ 9	⟨EM⟩ 25
A	⟨LF⟩ 10	26
B	⟨VT⟩ 11	⟨ESC⟩ 27
C	⟨FF⟩ 12	⟨FS⟩ 28
D	⟨CR⟩ 13	29
E	⟨SO⟩ 14	30
F	⟨SI⟩ 15	31

	8	9
0	⟨NUL⟩ 128	144
1	129	⟨DC1⟩ 145
2	130	⟨DC2⟩ 146
3	131	⟨DC3⟩ 147
4	132	⟨DC4⟩ 148
5	133	149
6	134	⟨SYN⟩ 150
7	⟨BEL⟩ 135	151
8	⟨BS⟩ 136	⟨CAN⟩ 152
9	⟨HT⟩ 137	⟨EM⟩ 153
A	⟨LF⟩ 138	154
B	⟨VT⟩ 139	⟨ESC⟩ 155
C	⟨FF⟩ 140	⟨FS⟩ 156
D	⟨CR⟩ 141	157
E	⟨SO⟩ 142	158
F	⟨SI⟩ 143	159

IBM special character set

These characters can be printed using the *Enable printing of all character codes* and *Enable printing of all character codes on next character* commands.

	0	1
0	Ø 0	► 16
1	⊕ 1	◄ 17
2	● 2	↕ 18
3	♥ 3	‼ 19
4	♦ 4	¶ 20
5	♣ 5	§ 21
6	♠ 6	▬ 22
7	• 7	↨ 23
8	◘ 8	↑ 24
9	○ 9	↓ 25
A	■ 10	→ 26
B	♂ 11	← 27
C	♀ 12	∟ 28
D	♪ 13	↔ 29
E	♫ 14	▲ 30
F	☼ 15	▼ 31

Glossary

Adobe Type Manager	Software for Windows and Macintosh which allows you to print PostScript fonts.
Adjustment lever	Lever which lets you adjust the position of the print head for differing paper thicknesses.
AEC mode	See Automatic Emulation Change mode.
Application	Software program, such as a word-processor, from which you can print out documents.
Auto line feed	Printer function in which the printer automatically performs a carriage return and line feed whenever it receives a carriage return control code.
Auto load position	Position of the print head after paper is loaded, relative to the physical top of the page.
AUTOEXEC.BAT	MS-DOS set-up file containing statements which determine to which port the printer output is to be sent.

Automatic Emulation Change mode   Printer mode in which the printer automatically senses which emulation mode (Standard or IBM) the computer requires, and changes mode accordingly.

Bi-directional printing   Mode in which the printer prints graphics both from left to right and from right to left.

Bit   Short for "binary digit". The smallest unit of information ("On" or "Off" – "1" or "0").

Bitmap fonts   Fonts that can only be printed at a particular size. The fonts which you can select from the printer's control panel are bitmap fonts.

Carriage return   An instruction from the printer which tells the printer to move the print position to the start of the current line. See auto line feed.

Centronics connector   The type of connector which plugs into the printer's interface connector socket.

Character code   A number which stands for a letter, digit or symbol. A computer sends text to the printer in the form of character codes.

Character set	A fixed set of characters which can be printed. A character set normally includes upper and lower case letters, the digits 0-9 punctuation symbols and various other characters, for example accented characters for foreign languages or block graphic characters.
Character table	See character set.
Code page	A variant of the IBM character set with characters for a particular country or region, for example, code page #860 - Portuguese.
Compatible	See IBM compatible.
Computer paper	See fanfold paper.
Control code	A code number which instructs the computer to perform a particular operation. For example, the computer sends the printer a form feed control code (12) to make it eject the current page.
Control panel	1) Panel on the printer that displays information about the printer's current working and allows you to operate the printer.
	2) Windows utility which allows you to make system settings, such as printer selection and port set-up.
Cut sheets	Single sheets of paper.
Default Printer	The printer which Windows applications automatically use.

Default setting	Feature setting adopted if no user setting has been made (sometimes called "factory setting").
DOS	See MS-DOS
Dot adjustment mode	Mode in which you can realign the print head in bi-directional graphics mode.
Double-spacing	Printed text with a blank line between each printed line.
Downloaded character	User-defined character, created on the computer. Sent to and stored in the printer for later printing.
Draft	Printing mode in which only the Draft font is used. The printer can print more quickly in Draft mode than in Letter Quality mode.
EDS settings	See Electronic DIP Switch settings.
Electronic DIP Switch settings	Printer settings which take effect when you switch on the printer. You can make these settings using the control panel.
Emulation	Imitation by one type of printer of the functions of another type of printer.
Epson LQ-860	Dot matrix printer which the LC24-30 Colour can emulate.
Epson mode	See Standard mode.
Extension cover	Part of the printer which holds printed output.

Face-down printing	Output is delivered face-down in sequential order. You can select face-down printing by pushing the paper delivery selector up and back.
Face-up printing	Output is delivered face-up in reverse order. You can select face-up printing by pulling the paper delivery selector forward.
Factory settings	See Default settings
Fanfold paper	Sheets of paper joined by perforations. Fanfold paper has small holes at the edges.
Fixed pitch font	See monospaced font.
Font	A set of characters of a particular typeface, which you can select for printing.
Font lock mode	Mode in which font selection can only be made from the printer's control panel.
Form feed	Printer operation which ejects the current page and feeds the next sheet into position, ready for printing.
Forward micro feed	Control panel operation which feeds paper through the printer in small steps.
Graphics direction	The printer's method of printing graphics. See bi-directional and uni-directional printing.
Handshaking	See protocol.

Hexadecimal dump   A printout of all character codes
and control codes as they are
received by the printer, along
with their hexadecimal (base 16)
values.

IBM mode   Mode in which the printer emu-
lates an IBM Proprinter X24E.

IBM compatible   A personal computer that can
run the same system and appli-
cations software as an IBM PC.

IBM PC   Personal computer made by IBM
capable of running MS-DOS and
Windows system software. See
also IBM compatible.

IBM Proprinter X24E   Dot matrix printer which the
LC24-30 Colour printer can emu-
late.

Icon   On-screen symbol in Windows or
Macintosh which represents a
program or document. You can
double-click on an icon to start
the program or open the docu-
ment.

Interface   Physical link between the printer
and the computer.

**International
character set**   Variant of the Standard character
set containing characters for a
particular country or region.

Landscape   Landscape mode is when a docu-
ment is printed on paper with the
longest sides of the paper at the
top and bottom.

Letter Quality	Printing mode in which the built-in fonts are used to produce high-quality (suitable for correspondence) text output.
Line feed	An instruction from the computer which tells the printer to advance the paper by one line.
Long test	Repetitive printer test showing every available font and pitch setting, all characters sets, current vertical alignment and current Electronic DIP switch settings.
Macintosh	Easy-to-use personal computer which allows you to print using TrueType and PostScript fonts (to use PostScript fonts you must have installed Adobe Type Manager). To use the printer with a Macintosh, you need an additional interface cable.
Macro	Printer function which allows you to save the font, pitch, zoom resolution, single-sheet auto load position and fanfold auto load position. Macro settings come into effect each time the printer is switched on.
Manual by-pass	Printer feature which allows you to print on a single sheet of special paper (such as letter-head paper) without removing the paper already in the paper tray.
Micro feed	See forward micro feed and reverse micro feed.

MODE statement	Statement in an MS-DOS AUTOEXEC.BAT file that determines to which port the computer should send printer output.
Monospaced font	Font in which all characters are of the same width.
MS-DOS	The most common operating system software for the IBM PC and compatible machines.
Multi-part form	Forms (such as invoices) consisting of several sheets, one on top of another, enabling several copies to be made simultaneously.
NCR sets	"No Carbon Required" – multi-part forms which use pressure-sensitive chemicals to mark the lower copies.
Not-ready mode	Printer mode in which you can change printer settings using the control panel. The printer cannot print in not-ready mode.
Orientation	The rotation in which paper is loaded. See landscape orientation and portrait orientation.
Over-printing	Printing text on top of existing text. This may be caused by an incorrect auto line feed setting.
Paper delivery selector	Printer part that lets you choose whether print-outs are delivered face-up or face-down.
Paper feed	Control panel operation which allows you to feed paper through the printer one line at a time.

Paper guides	Devices which hold single sheets so that they are fed into the printer correctly.
Paper out	Printer function which automatically detects when the paper has run out and stops printing.
Paper tray	Part of the printer which holds paper for feeding into the printer. The tray can hold up to fifty-five single sheets.
Parallel cable	Standard cable for connecting the printer to a computer.
Parallel interface	An interface which transfers data between the computer and the printer 8 bits at a time.
Parity checking	A way of checking that information sent over a serial interface has been received correctly.
Parking paper	Printer function that allows you to print on single sheets without removing fanfold paper.
Pitch	The number of characters in a one-inch line of text.
Platen	Roller that guides paper through the printer and provides a solid surface against which the print head can make an impression on the paper.
Port	Socket in the back of a computer through which a computer communicates with other devices, such as the printer.

Portrait	Portrait mode is when a document is printed on paper with the longest sides of the paper at the sides.
PostScript font	Type of scalable font similar to TrueType fonts. PostScript fonts can be printed if you have installed the Adobe Type Manager program on your computer.
Print gap	The distance between the print head and the platen. This distance can be adjusted to suit different thicknesses of paper.
Print head	Printer part that transfers the image to the paper.
Print head shield	A thin metal plate between the print head and the platen.
Print pitch	See pitch.
Printable area	The part of the page on which the printer can print.
Printer driver	Computer file which enables system or application software to print to a particular printer.
Proportionally spaced font	Font in which different characters can be of different widths.
Protocol	Method of regulating information transfer between the computer and the printer. Sometimes called "handshaking".
Push tractor unit	Optional accessory that allows you to print on fanfold paper.

Quiet mode	Mode in which the printer prints more quietly (and slightly more slowly).
Ready mode	Printer mode in which the printer can receive and print data from the computer.
Release lever	Lever that grips single sheets as they are fed into the printer.
Reverse micro feed	Control panel operation which to feeds paper backwards through the printer in small steps.
Ribbon cartridge	Cartridge that contains the ribbon which the head uses to mark the paper.
Scalable fonts	Fonts which you can print at any size. TrueType fonts are scalable.
Serial interface	A computer interface which transfers data one bit at a time.
Serial-to-parallel interface converter	Optional accessory that allows you to connect the printer to a serial port on your computer.
Short test	Printer test in which seven lines of characters are printed. If you have fitted a color ribbon, each line will be printed in a different color.
Stack wire	Wire that pulls out to support printed pages resting on the extension cover.
Standard mode	Mode in which the printer emulates an Epson LQ-860 printer.

System software   Software that runs on your computer to control basic computer functions (screen display, keyboard input, disk access and printer output).

Tear-off function   Printer function which allows you to remove fanfold output without altering the current position of the fanfold paper.

Thumb wheel   Printer wheel that allows you to advance paper manually.

Tractor   Part of the push tractor unit which grips the fanfold paper.

TrueType font   Type of scalable font which you can install on your computer and print on the printer (provided you are using Windows 3.1 or later).

Typeface   The design style of a font. Common typefaces are Times and Helvetica.

Uni-directional printing   Mode in which the printer prints graphics from left to right only.

Vertical alignment   See dot adjustment mode.

Weight   The thickness of the lines which make up a font's characters. Common weights are Medium, Bold and Black.

Windows   System software for the IBM PC which has an easy-to-use interface.

Zoom mode   Printer mode that allows you to print documents scaled to 50% or 67%.

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