

CITIZENTM
PRO*dot* 300
User's Manual

DECLARATION OF CONFORMITY

We, Citizen Systems & Peripherals Europe Ltd.
Tanashi Dori, Scunthorpe
North Lincolnshire, DN17 1AL
United Kingdom

declare under our sole responsibility that the product:

Product Type: Dot Matrix Printer
Model Name: BB10-M02
Trade Name : PROdot 300

manufactured at : Citizen Yoshimi Co., Ltd.
1006 Shimo-Hosoya
Yoshimi-machi
Hiki-gun, Saitama 355-0118
Japan

, to which this declaration relates is in conformity with the following standards:

Safety: EN60950 / 1992
EMC: EN55022 / 1987
EN50082-1 / 1992

following the provisions of EMC (89/336/EEC) and LVD (73/23/EEC), based on the following documents:

1. GS-mark and Test Report issued by TÜV Rheinland.
2. EMC Test Report issued by EMC Kashima Corp.
3. Technical document including information on production control kept at which will be made available upon request.

Trademark Acknowledgement

Citizen, PROdot 300: Citizen Systems & Peripherals Europe Ltd.
Epson and Epson LQ: Seiko Epson Corporation
IBM, OS/2, Proprinter, : International Business Machines Corporation
Microsoft, MS, MS-DOS, Windows, Windows NT : Microsoft Corporation



As an Energy Star Partner, Citizen America Corporation has determined that this product meets the Energy Star guidelines for energy efficiency.

Important Safety Instructions

1. Read all of these instructions and save them for later reference.
2. Follow all warnings and instructions marked on the product.
3. Unplug this product from the wall outlet before cleaning. Do not use liquid or aerosol cleaners. Use a damp cloth for cleaning.
4. Do not use this product near water.
5. Do not place this product on an unstable cart, stand or table. The product may fall, causing serious damage to the product.
6. Slots and openings on the cabinet and the back or bottom are provided for ventilation. To ensure reliable operation of the product and to protect it from overheating, do not block or cover these openings. The openings should never be blocked by placing the product on a bed, sofa, rug or other similar surface. This product should never be placed near or over a radiator or heat register. This product should not be placed in a built-in installation unless proper ventilation is provided.
7. This product should be operated from the type of power source indicated on the marking label. If you are not sure of the type of power available, consult your dealer or local power company.
8. This product is equipped with a 3-wire grounding-type plug, a plug having a third (grounding) pin. This plug will only fit into a grounding-type power outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the grounding-type plug.
9. Do not allow anything to rest on the power cord. Do not locate this product where the cord will be walked on.
10. Never push objects of any kind into this product through cabinet slots as they may touch dangerous voltage points or short out parts that could result in a risk of fire or electric shock. Never spill liquid of any kind on the product.
11. Except as explained elsewhere in this manual, don't attempt to service this product yourself. Opening and removing those covers that are marked "Do Not Remove" may expose you to dangerous voltage points or other risks. Refer all servicing on those compartments to service personnel.
12. The mains plug on this equipment must be used to disconnect mains power. Please ensure that the socket outlet is installed near the equipment and shall be easily accessible.
13. Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:
 - A. When the power cord or plug is damaged or frayed.
 - B. If liquid has been spilled into the product.
 - C. If the product has been exposed to rain or water.
 - D. If the product does not operate normally when the operating instructions are followed. Adjust only those controls that are covered by the operating instructions since improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to normal operation.
 - E. If the product has been dropped or the cabinet has been damaged.
 - F. If the product exhibits a distinct change in performance, indicating a need for service.

This Plug is Not Waterproof - Keep Dry

The power cord is already fitted with a moulded plug incorporating a fuse, the value of which is indicated on the pin face of the plug. Should the fuse need to be replaced, an ASTA approved BS1362 fuse must be used of the same rating, marked thus. If the fuse cover is detachable, never use the plug with the cover omitted. If a replacement fuse cover is required, ensure it is of the same colour as that visible on the pin face of the plug (i.e. red or orange). Fuse covers are available from the Parts Department indicated in your user instructions. If the plug supplied is not suitable for your socket outlet, it should be cut off and destroyed *.

The end of the flexible cord should be suitably prepared and the correct plug fitted.

*** WARNING: A PLUG WITH BARED FLEXIBLE CORDS IS HAZARDOUS IF ENGAGED IN A LIVE SOCKET OUTLET**

The wires in this mains cord are coloured in accordance with the following code:-

Green/Yellow = Earth, Blue = Neutral, Brown = Live. As these colours may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:-

The wire which is coloured Green/Yellow must be connected to the terminal in the plug which is marked with the letter E or by the earth symbol \perp or coloured Green or Green/Yellow. The wire which is coloured Blue must be connected to the terminal which is marked with a letter N or coloured Black or Blue. The wire which is coloured Brown must be connected to the terminal which is marked with the letter L or coloured Brown or Red.

IMPORTANT: THIS APPLIANCE MUST BE EARTHED

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Chapter 1

Overview

Features

Thank you for purchasing a Citizen PROdot 300 printer.

Combining high speed, high quality output with advanced paper handling capabilities, this versatile, 24-pin, flatbed printer is ideal for a wide range of multi-part and cut-sheet printing requirements. Reliability, flexibility and ease-of-use are key features, making the PROdot 300 the perfect choice for performing demanding applications in a variety of environments.

Versatile, Reliable, Straight Paper Path

The straight paper path enables paper to feed through the printer without bending, thus reducing the risk of paper jamming. The versatile PROdot 300 prints on a wide variety of paper types from 7-part forms to labels, envelopes and reports, as well as media up to 0.45 mm thick.

Easy Paper Handling

The printer has several other useful features which help eliminate paper handling problems and ensure quick, accurate results.

Automatic paper loading/ejection with automatic skew detection

The automatic paper load function ensures cut sheet paper fed into the printer is correctly positioned. The PROdot 300 also has an automatic skew detection function, which ejects forms which are not fed in straight.

At the touch of a button, tractor paper loaded onto the tractor is automatically set to the printing position. When printing is completed, the paper feeds out to the front table for easy tear-off.

Zero tear-off function

This causes tractor paper to be automatically fed to the tear-off position at the edge of the top cover, for easy tear-off at the perforations after printing. This zero tear-off capability helps eliminate paper wastage.

Paper park function

A simple command on the control panel enables tractor paper to be retracted out of the print mechanism so that cut sheet paper can be fed into the printer. After the cut sheet has been printed, the fanfold stationery can be advanced back into the print mechanism for the next print job.

Automatic Interface Switching

The PROdot 300 is equipped with two interface connectors and therefore accepts both parallel (Centronics) and serial (RS-232C) data transfer. The printer automatically detects the type of data transfer received from the host computer and switches to the corresponding interface type.

High Quality, High Speed Printing

This PROdot 300 produces high quality printing in Letter Quality mode at a speed of 66 cps at 10 cpi. In Draft mode, the printer outputs 200 cps at 10 cpi or 300 cps at 15 cpi.

High Resolution Graphics

A maximum resolution of 360 x 360 dpi enables the printer to produce fine, sharp graphics.

User-Friendly Control Panel

Current print status and access to all printer functions is available via simple commands from the control panel. In addition, the control panel is used to access the VuePrint™ menu system (Setup menu system) with complete control over the printer's set-up.

Dual Emulation

The printer comes with both IBM Proprinter X24E and Epson ESC/P2 emulations as standard.

Large Data Buffer

A large 96Kb data buffer quickly frees your computer for other work while the PROdot 300 processes the printing task.

Barcode Generator

NW-7, EAN-13, EAN-8, Code 39, Industrial 2 of 5, Interleaved 2 of 5, Code 128 B, and Code 128 C are built-in as standard.

On-line Macro Command

The ability to define printer settings in a macro allows you to restore your preferred default settings by simply loading the macro into the printer's memory.

Optional Front Table Extension Tray

A front table extension tray is available to facilitate paper handling of larger cut sheet media.

Chapter 2

Preparation

Unpacking

Check each item against the following packing list. If any of these items are missing, please contact your dealer.

NOTE

Hold the bottom of printer in the box, and then carefully lift it up. As you unpack, save all the original packing materials. They are specially designed to protect the printer and will make repacking easy. Before using your new printer, please remove the shipping pads from the printer. - Open the top cover and remove the five shipping pads.

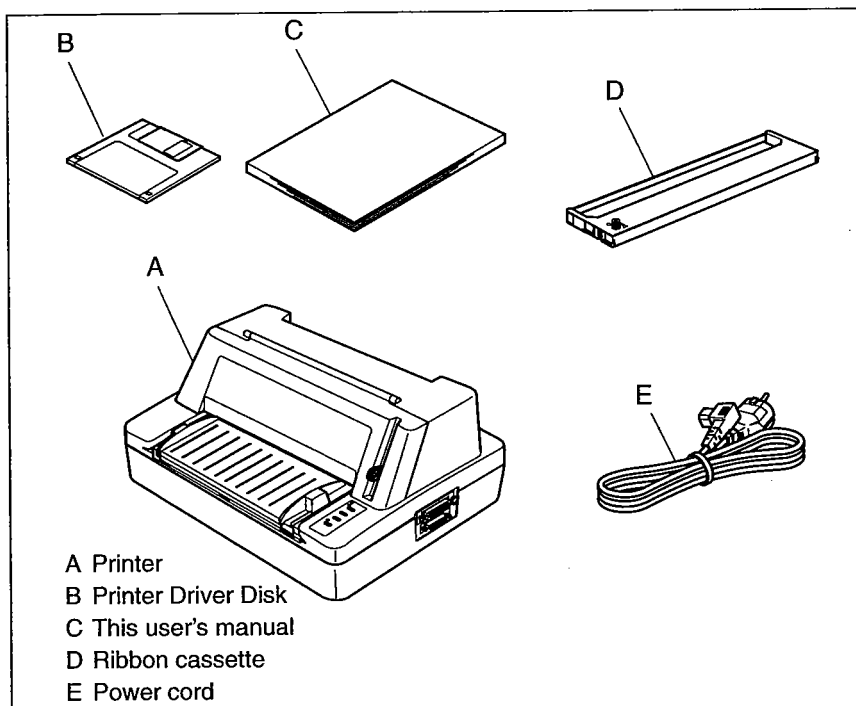


Figure 2-1 Packing list in the printer box

Parts Identification

Figures 2-2 and 2-3 highlight the main components of the printer.

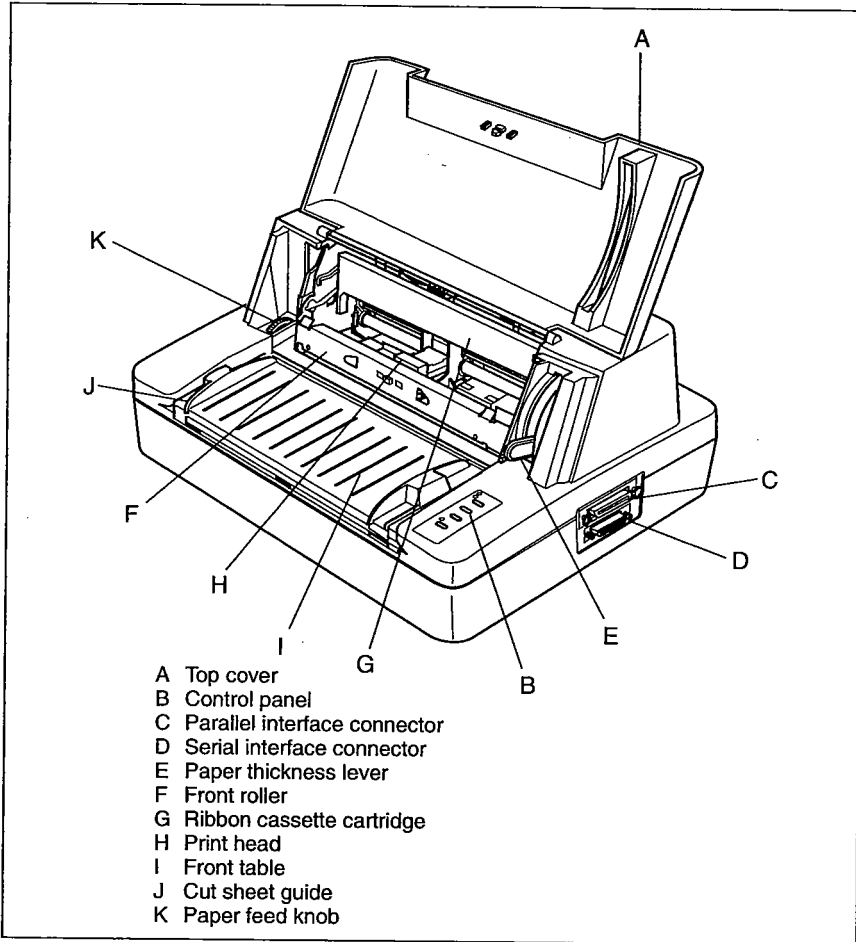


Figure 2-2 Main parts of printer (front view)

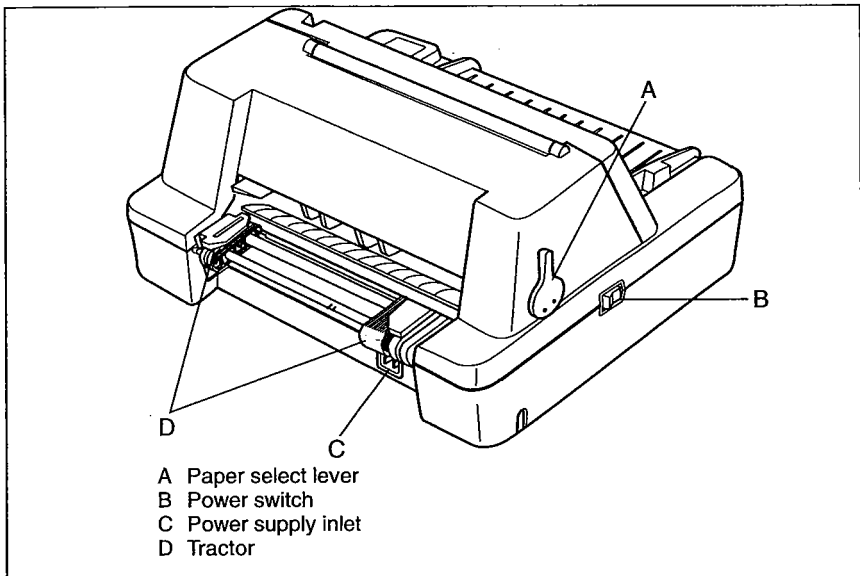


Figure 2-3 Main parts of printer (rear view)

Installation

Before placing the printer in your chosen location, consider the following guidelines:

- This printer should be placed on a normal table or desk. Be sure that the surface is level, to avoid an uneven load on the carriage as it operates.
- Do not install the printer where it may be subjected to:
 - Extremes of temperature or humidity
 - Severe vibration
- Do not use the printer:
 - Where there is excessive dust.
 - Where it may be splattered with oil or metallic dust.
 - Where it may be exposed to direct sunlight.
 - Where it may be accidentally splashed with water.

Installing and Replacing the Ribbon Cassette

- 1 Ensure the printer is turned OFF.
- 2 Open the top cover by holding the side of top cover as shown in Figure 2-4.

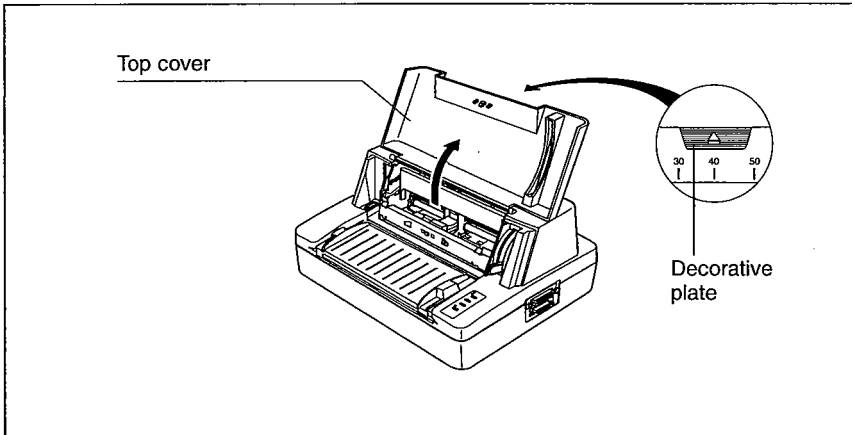


Figure 2-4 Opening the top cover

- 3 Pull the front roller unit by gripping the center area of the unit by your forefingers until you hear a click. Then lift it up until the unit is positioned on the top of printer as shown in Figure 2-5.

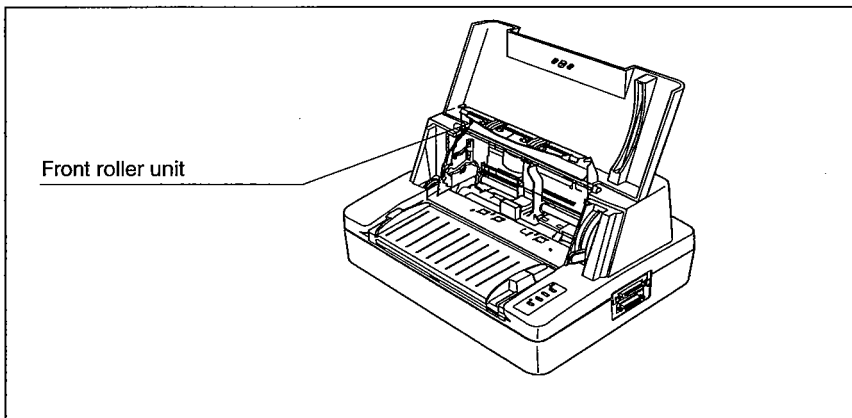


Figure 2-5 Opening the front roller unit

- 4 If necessary, centre the print head by hand
- 5 Hold the ribbon cartridge with the knob facing upwards and turn the ribbon knob in the direction shown by the arrow to take up any slack in the ribbon.
- 6 To install the ribbon cartridge, hold it with both hands, with the ribbon facing down as shown in Figure 2-6.

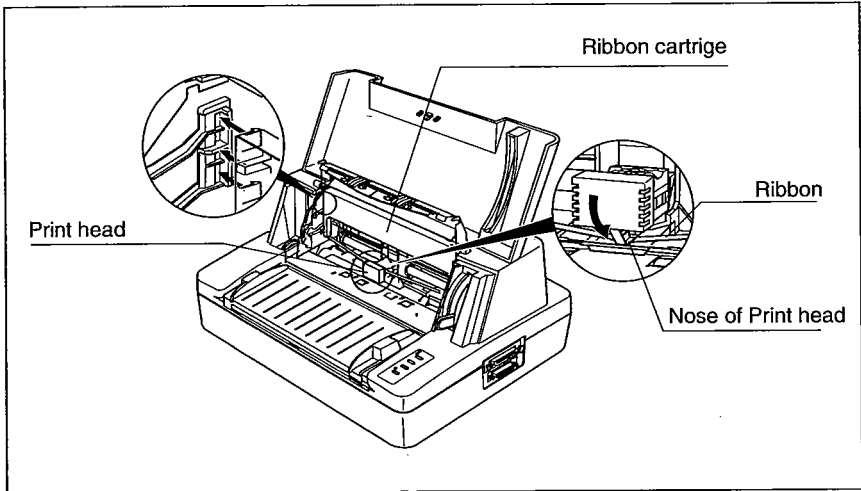


Figure 2-6 Installing the ribbon cassette

**Make sure
that the
following**

- ☐ When you look at the print head you will find a small piece of black plastic on the thin metal sheet of the ribbon guide. Make sure that the ribbon goes under the piece of plastic.
 - ☐ Position the ribbon cartridge with the tabs on its case over the slots inside the printer case.
 - ☐ With the ribbon cartridge and ribbon correctly positioned, gently push the cartridge towards the back of printer until it clicks into place.
- 7 Move the print head from side a few times to make sure the ribbon goes into the ribbon guides.
 - 8 Having installed the ribbon, lower the front roller unit and close the top cover.

Connecting to the Power Source

- Connecting the Power Cord** Plug the power cord (supplied) into the power inlet at the rear of the printer.
- Check that the power switch (located on the left of the printer) is in the OFF position, then plug the power cord into the wall outlet.

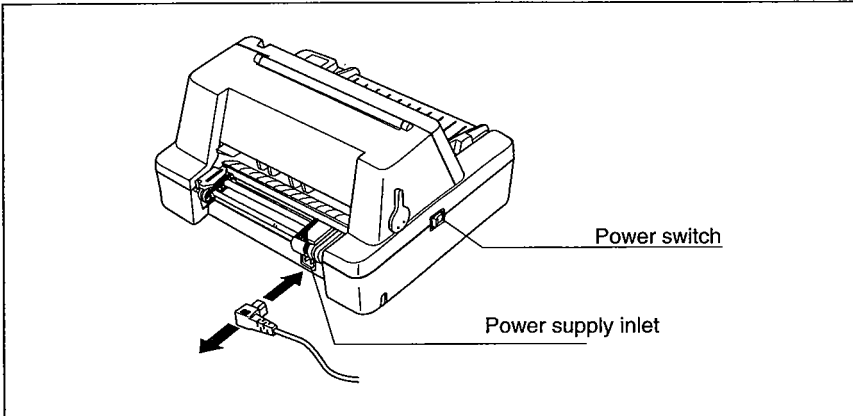


Figure 2-7 Connecting the power cord to the printer

- Turning the Power On and Off** To turn the printer ON, press the **I** mark at the side of the power switch.
- To turn the printer OFF, press its **O** mark at the side of the printer switch.

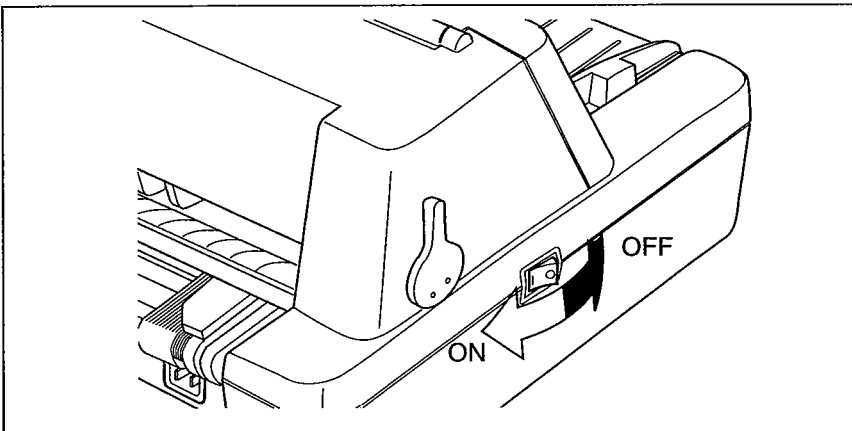


Figure 2-8 Turn the power switch on and off

Chapter 3

Loading Paper

Paper Thickness Adjustment

Before loading cut sheet or tractor paper, you have to adjust the paper thickness lever on the right of the printer.

To feed thicker papers through the printer, you need to move the paper thickness lever from its standard position.

The lever moves the print head relative to the platen so that there is more room for the paper.

Adjusting the Paper Thickness Lever

To obtain good quality printing and prevent problems (paper jam etc.) Adjust the paper thickness lever as shown in the Figure 3-1. The scale number # 1 shown in Figure 3-1 identifies the standard paper thickness setting. This is the recommended setting for most papers. Use Table 3-1 to find the recommended setting for other papers.

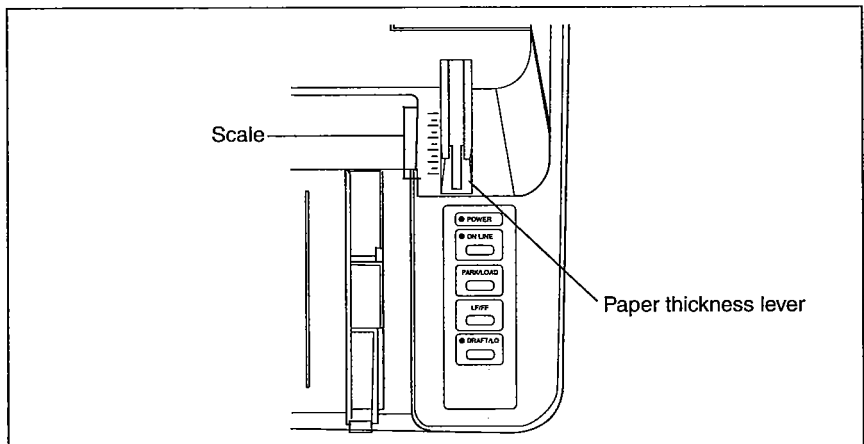


Figure 3-1 Setting the paper thickness lever

Table 3-1 Paper thickness setting

Paper thickness lever position	Number of copies (including original)	Paper thickness (mm)	Approx. weight (gms)
1 (standard position)	1 or 2	0.06 ~ 0.12	60 ~ 120
2	3 or 4	0.18 ~ 0.24	180 ~ 240
3	5	0.30	Up to 300
4	6	0.36	Up to 360
5	7	0.45	Up to 400

- Loading Cut Sheets**
- 1 Turn the printer on.
 - 2 Set paper select lever toward the back of printer as shown in Figure 3-2.

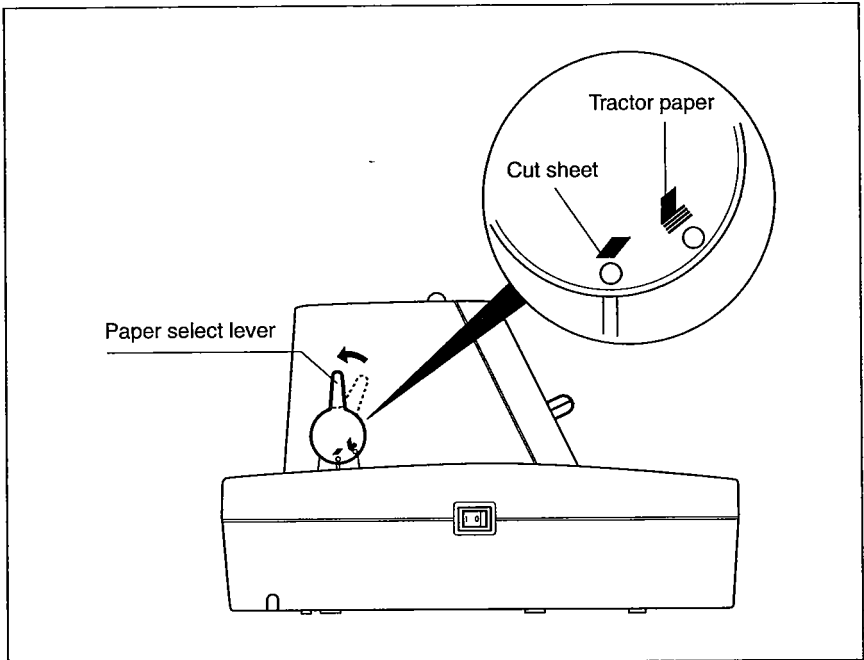


Figure 3-2 Setting the paper select lever

- 3 Position the left hand cut sheet guide by referring to the marking on the top cover. The positions for A4 and Letter size paper are indicated on the left side of top cover as shown in Figure 3-3.

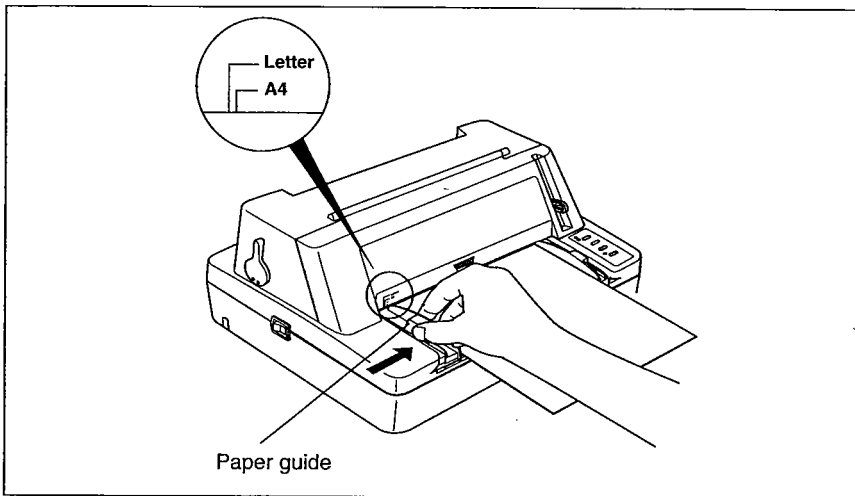


Figure 3-3 Adjusting the paper guide

- 4 Insert the paper as shown in Figure 3-4.
The paper is fed automatically into the printer and stops at the print start position. You can set the printer to detect skew so if the paper skews during loading, the printer detects it and automatically ejects the paper to the front table.

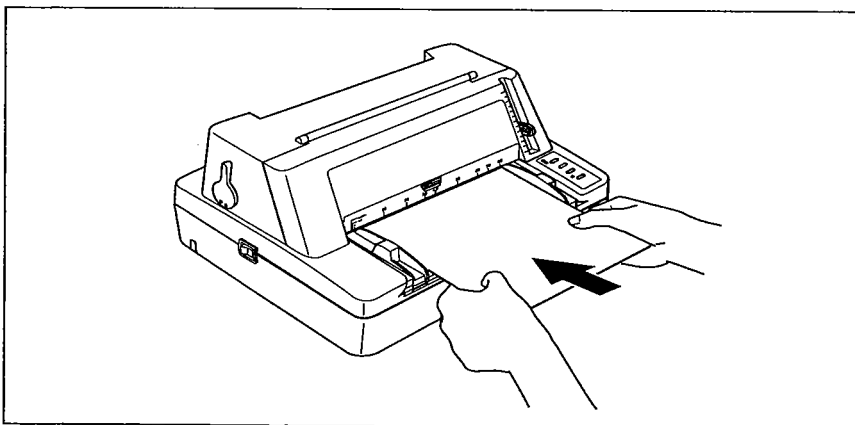


Figure 3-4 Loading cut sheet

NOTE

The printers skew detection level can be set within the default setting menu.

Using Tractor Paper

This printer feeds tractor paper from the rear of the printer to the front.

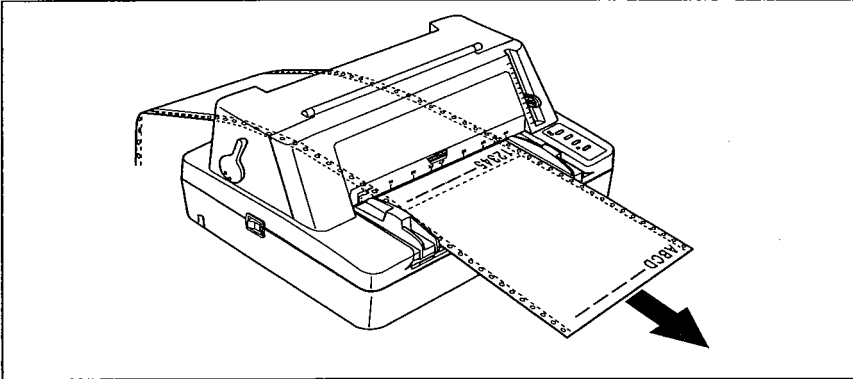


Figure 3-5 Feeding direction of tractor paper

Setting the Printer for Tractor Paper

- 1 Open the top cover. (see Figure 2-4)
- 2 Set the power cord into the groove at the back of the lower case of printer as shown in Figure 3-6.

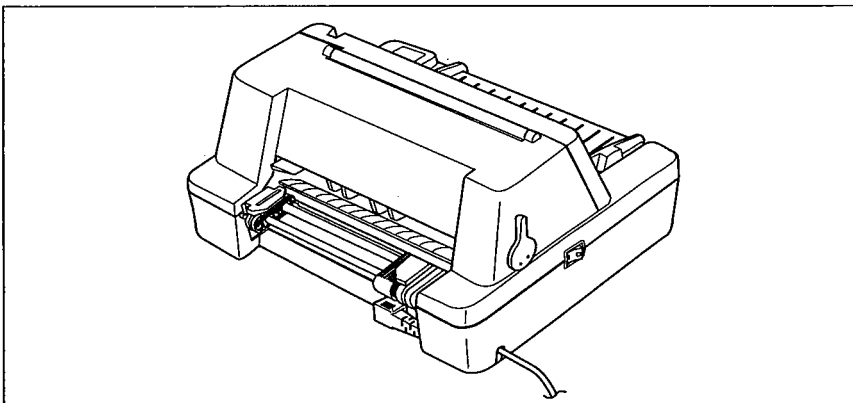


Figure 3-6 Setting the power supply cord

Loading Tractor paper

- 1 Turn the printer on.
- 2 Set paper select lever toward the front of printer as shown in Figure 3-7.

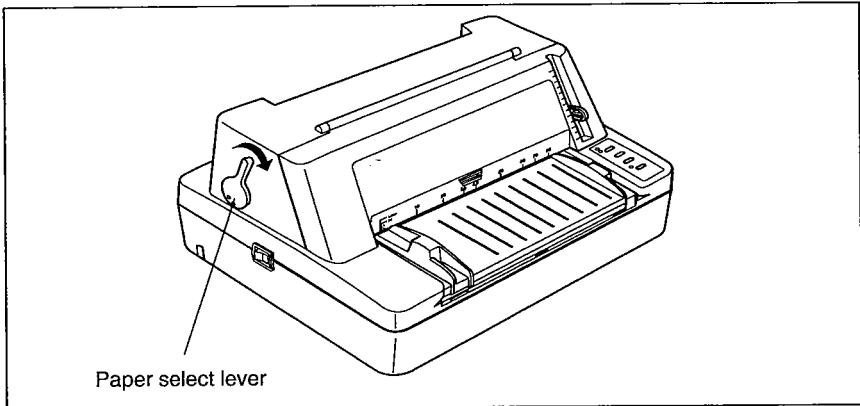


Figure 3-7 Setting the paper select lever

- 3 Release the lock lever of left tractor and move the tractor to the left edge of the tractor paper.
Fasten the lock lever to lock the tractor in position.
- 4 Open the tractor paper guide and place the paper on the sprocket pins as shown in Figure 3-8. If you are using pre-printed paper or labels, install them with the printed or labeled side facing upwards.

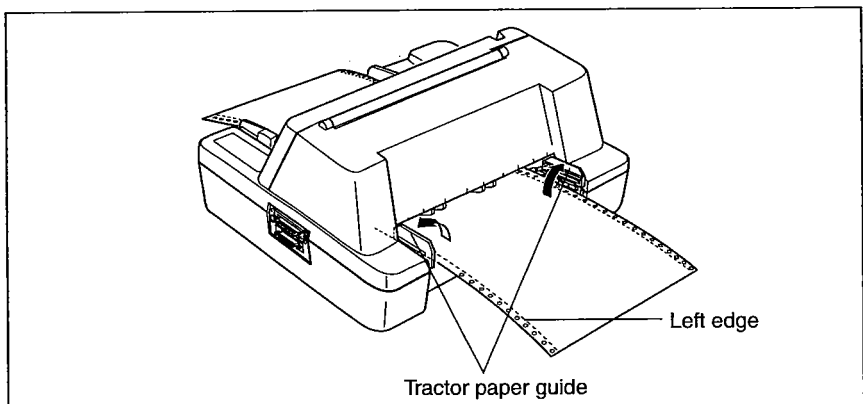


Figure 3-8 Setting tractor paper into the tractor

NOTE

When paper is loaded to the tractor, please set the top of paper to the edge of the tractor paper guide as shown in Figure 3-9.

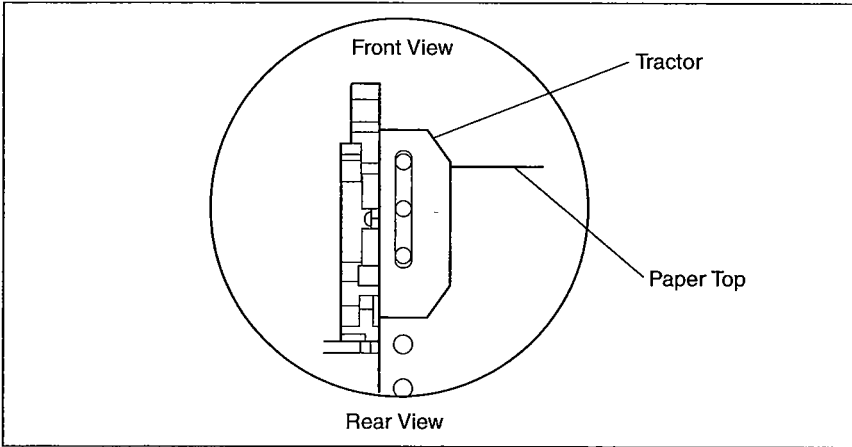


Figure 3-9 Setting paper on the sprocket pins

- 5 Release the lock lever of the right tractor and open the tractor paper guide. Place the paper on the sprocket pins, then close the paper guide.
- 6 Slide the right tractor to left to take up any slack in the paper, then fasten the lock lever to fix the tractor in position as shown in Figure 3-10.

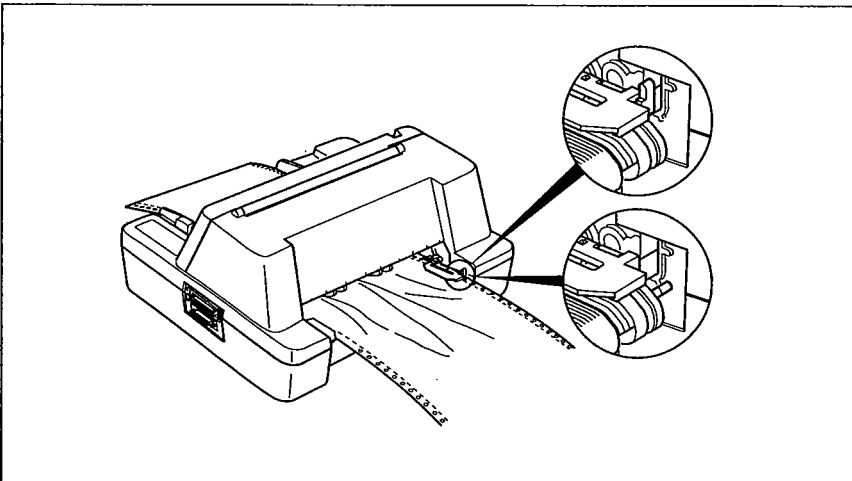


Figure 3-10 Adjusting the tractor position

7 Align the paper with the print start position.

Ensure the tractor paper is inline with the print start position. If the paper is not aligned with the print start position, release the tractor lock levers of the left and right tractors, align the paper, and then fasten the lock lever to lock the tractors.

Tractor Paper tear off

To tear off the paper, make sure that printed paper is fed to the front table. If not, turn off-line then press **PARK/LOAD** key.

Hold the edge of paper and pull it to the edge of the top cover as shown in Figure 3-11.

If the perforation of the paper is not at the edge of the top cover, adjust the tear off position (refer to chapter 5, Control Panel)

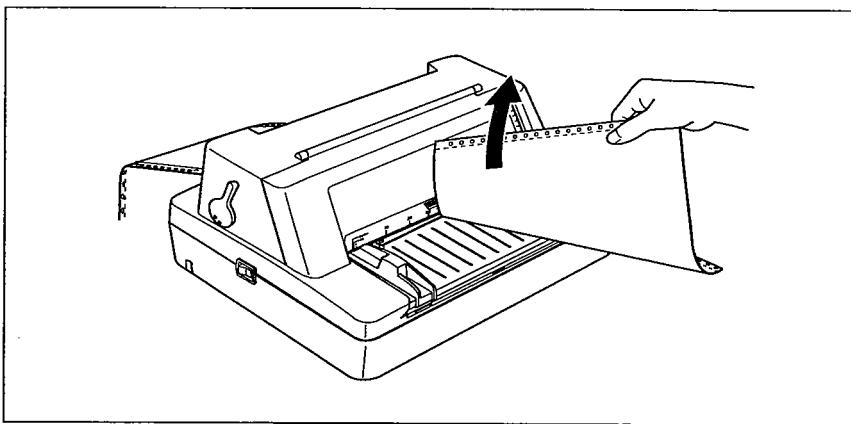


Figure 3-11 Tractor paper tear off

Printing a Demonstration Page

Now that you have, installed the ribbon and loaded paper, you can test the printers operation by printing the demonstration page.

Turn the power on whilst holding down the **LF/FF** key.

The demonstration page is printed. This makes sure that you have correctly installed the ribbon, and paper.

Connecting the Interface Cable

Connect the parallel or serial interface cable as shown in the figure below:

Caution

Make sure that the power switches of both printer and host computer are turned OFF before you connect the cable.

Using the Parallel Interface

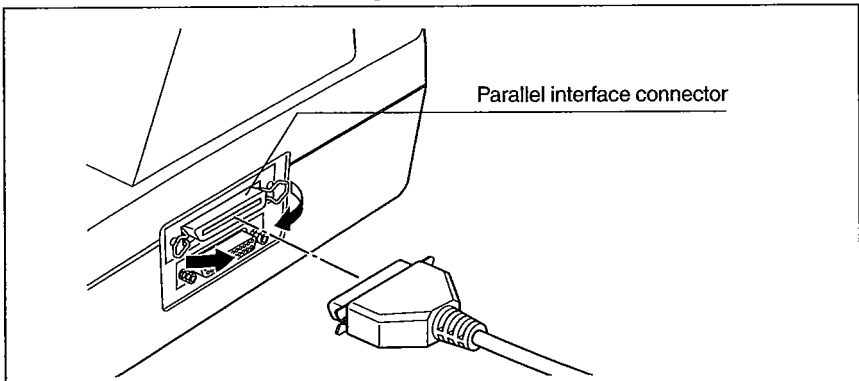


Figure 3-12 Connecting the parallel interface cable

Using the Serial Interface

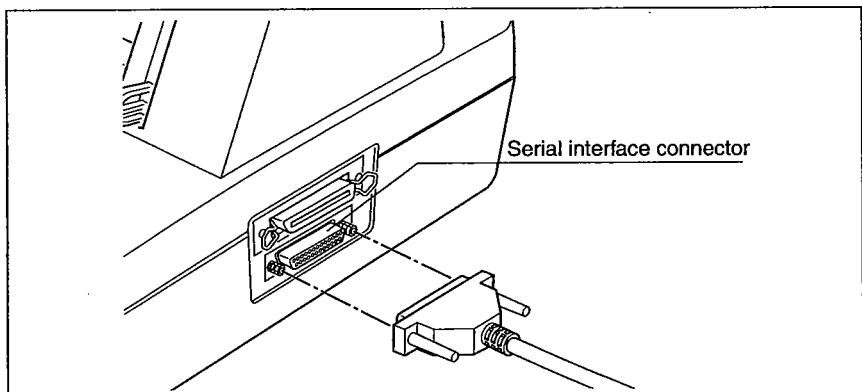


Figure 3-13 Connecting the serial interface cable

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Chapter 4

Printing from Your Software

Setting Up Your Printer To Work With Your Software

The printer supports two standards of printed output, or emulations, these are:

- Epson LQ 570
- IBM Proprinter X24e

The printer that you have purchased is clever in that it can automatically detect if your software is set to any one of these and switch into it, we call this Auto Set Level 1. Therefore, within your software, select the driver for this printer from the following list:

- Citizen PRO*dot* 300
- Epson LQ 570
- Epson LQ 860
- Epson LQ 850
- IBM X24E
- IBM X24

The higher in the list the better.

The best way to ensure that all the features on your printer are supported is to use the Citizen printer driver. If one is not available on your software please call your software company, we are updating the available drivers constantly.

Your printer is supplied with a printer driver disk for Microsoft Windows 95 and NT4. Please use the following instructions to load the printer driver into your software.

Instruction to Install CITIZEN printer Driver in Windows 95 & 3.1x & NT4

MS Windows 95 Installation Instructions

Your Citizen Printer Driver is installed by first starting your Windows 95 Operating system:

NOTE

The Citizen PROdot 300 Windows 95 driver is to be found in country specific directories located within the WIN95 directory.

- Place your printers Driver Disk in drive A: of your computer.
- Click on START, SETTINGS, PRINTERS.
- Double Click on ADD PRINTER, NEXT.
- Click on HAVE DISK. (remember to put your Driver Disk into floppy disk drive A:)
- Click BROWSE and access your appropriate Driver language directory.
e.g. **A:\WIN95\ENGLISH**
- Follow the Screen Instruction in choosing your printer model and communications port. (typically LPT1:)
- Choose to print a test page if required, click FINISH.
- If you chose to print a test page, click YES.
- Your printer is now installed.
- Once installed, Double Click on the installed printer icon to change or modify any printer settings.

MS Windows 3.1x Installation Instructions

First start your Microsoft Windows 3.1x Operating system:

- From Program Manager, select Main. Then open Control Panel and select Printers.
- Select **ADD** and **INSTALL**.
- From the List of Printers Choose a compatible printer. Press **Install...**
- Once installed, Click on **Setup..** to configure the driver for your needs.

MS Windows NT4 Installation Instructions

Your Citizen Printer Driver is installed by first starting your Microsoft NT4 Operating system:

- Place your printers Driver Disk in drive A: of your computer.
- Click on START, SETTINGS, PRINTERS.
- Double Click on ADD PRINTER, NEXT.
- Click on HAVE DISK. (remember to put your Driver Disk into floppy disk drive A:)
- At the COPY Manufacturers Window insert your NT4 Driver Location.
e.g. **A:\NT4**
- Follow the Screen Instruction in choosing your printer model and communications port. (typically LPT1:)
- Choose to print a test page if required, click FINISH.
- If you chose to print a test page, click YES.
- Your printer is now installed.
- Once installed, Double Click on the installed printer icon to change or modify any printer settings.

Chapter 5

Control Panel

The Control Panel Keys and Indicator LED

This control panel consists of 4 keys and 3 indicator LED's as shown in Figure 5-1.

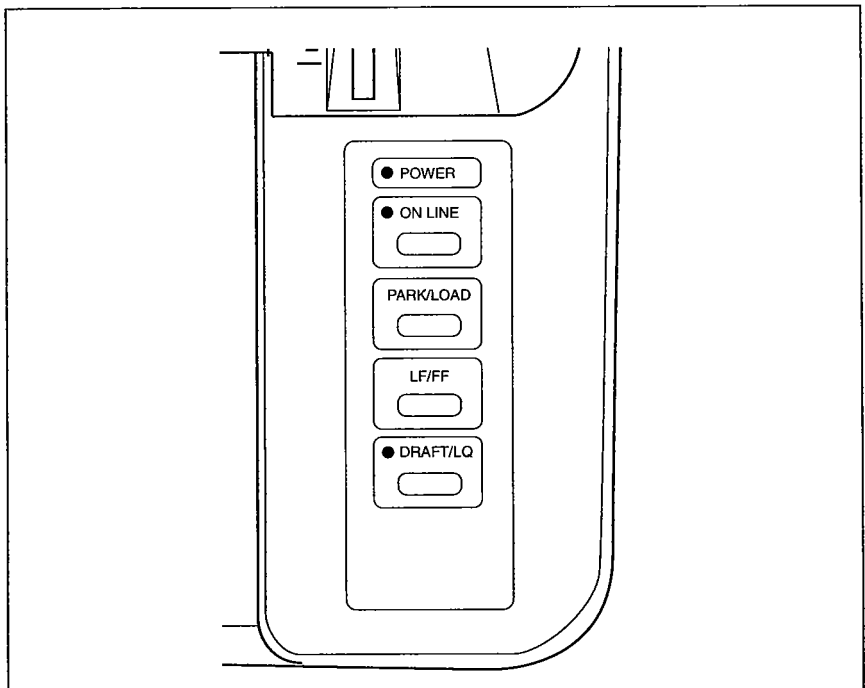


Figure 5-1 The Printer Control Panel

The following table details each indicator LED function:

Table 5-1 LEDs on the control panel

Indicator LED	On	Off
POWER (orange)	Lights when the printer is turned on. It flashes when paper runs out and during error conditions (See Appendix A)	The printer is turned off.
ON LINE (green)	Lights when the printer is on-line.	The printer is off-line.
DRAFT (yellow)	Lights when the printer is in draft mode.	The printer exits draft mode.

Basic Control Panel Operations

You can use the four switches on the control panel to control the operation of the printer.

ONLINE Pressing the **ONLINE** key, toggles between on-line and off-line mode.

PARK/LOAD In the off-line mode, pressing the **PARK/LOAD** key controls feeding tractor paper and cut sheets.
Each time pressing and hold **PARK/LOAD** key feeds tractor paper to *the top of form position* then to *the tear-off position* then to *the parked position*.

LF/FF In the off-line mode, pressing the **LF/FF** key advances tractor paper and cut sheets by one line. Pressing and hold this switch feeds tractor paper to the tear-off position.
If you press **LF/FF** key again, the paper is fed reversely to the second line of next page.

DRAFT In the off-line mode, toggles between DRAFT and LQ mode.

Top of Form Adjustment mode

The top of form setting determines the gap between the top of paper and the first printed line (the top margin).

In the on-line mode, press the **LF/FF** key for about 3 seconds causes the printer to enter the top of form adjustment mode. The **ON LINE** and **POWER LED** blink alternatively.

NOTE

The top margin is usually set by your software. However, when you place the printer off line the printer uses the top margin setting, for example when you first load paper. You should not need to alter it very often.

Use the **PARK/LOAD** and **LF/FF** keys to alter the top of form setting:

PARK/ LOAD: Increase the top of form by 1/60 inch. You can increase the setting to a maximum of +60 increments (+60/60 inch) from the factory setting (0/60 inch).

LF/FF: Decrease the top of form by 1/60 inch. You can decrease the setting to a maximum of -10 (-10/60 inch) from the default setting (0/60 inch) .

To exit and Save your new setting, press the **ON LINE** key. The **POWER** and **ON LINE LED** blink simultaneously 3 times with beep sound, then the **POWER LED** turns on.

NOTE

To exit without saving, just turn the printer OFF.

Tear off Adjustment mode

The tear off setting determines the gap between the perforation of tractor paper and the edge of the top cover.

It allows you to tear off perforated sheets quickly. With continuous-feed paper loaded in the printer. In the online mode, pressing the **PARK/LOAD** and **LF/FF** keys about 3 seconds causes the printer to enter the tear off adjustment mode. When the printer enters this mode, the **ON LINE** blinks and the **POWER LED** blink alternately.

Use the **PARK/LOAD** and **LF/FF** keys to alter the tear off setting:

PARK/LOAD: Increase the top of form by 1/60 inch. You can increase the setting to a maximum of +15 increments (+15/60 inch) from the default setting (0/60 inch).

LF/FF: Decrease the top of form by 1/60 inch. You can decrease the setting to a maximum of -15 increments (-15/60 inch) from the default setting (0/60 inch).

To exit and save your new setting, press **ON LINE** key. The **POWER** and **ON LINE LEDs** blink simultaneously 3 times, then the **POWER LED** turns on. Your new tear off setting value is saved.

NOTE

To exit without saving, just turn the printer OFF.

Changing Printer Settings

The factory setting of your printer have been selected to suit the majority of users. However, you may need to use a different character set for a different language for example, or may prefer a different print style. To alter your printer settings, you use the Set up Menu System.

The Set up Menu System contains a number of menus - lists of possible settings - which it prints out one at a time. When a menu is printed, you can save a new setting in it, or move onto the next menu without altering the current setting.

NOTE

You do not have to go all the way through the menu system: once you have made all the changes you want, you can exit Setup by switching off the printer. When you switch it on again, the printer uses the new settings.

This section describes:

- ☐ How to print a report showing the current printer settings
- ☐ How to change the settings
- ☐ How to revert to the factory settings.

Printing the Current Setting Report

You can use the information in the current report to decide which settings you want to alter.

To print the current settings:

1. Turn the printer off.
2. Press and hold down the **PARK/LOAD** and **LF/FF** keys and turn the printer back on.

The printer automatically loads paper and prints the current settings. An example print out is shown in Figure 5-2.

Control Panel

Default Setting Report							
Default settings are <u>FILLED</u> .							
INSTALL 1							
LANGUAGE	ENGLISH	FRANCAIS	DEUTSCH	ITALIANO	ESPAÑOL	PORTUG.	NEDERL.
EMULATION	EPSON	IBM	AUTO				
PRINT STYLE							
FONT	DRAFT	FONT 1	FONT 2	FONT 3	FONT 4	FONT 5	FONT 6
	FONT 7	FONT 8					
EMPHASIZED	OFF	ON					
PITCH	10 CPI	12 CPI	15 CPI	PROPORTIONAL			
FONT LOCK	OFF	ON					
PAGE LAYOUT							
LINE SPACING	6 LPI	8 LPI					
FORM LENGTH	8 INCH	9 INCH	8.5 INCH	11 LETTR	11.69 A4	12 INCH	14 LEGAL
PAGE SKIP	OFF	ON					
PRINT MODE							
TEXT DIR	BI-DIR	UNI-DIR					
GRAPHIC DIR	BI-DIR	UNI-DIR					
AGM MODE	OFF	ON					
CHARACTER							
SLASH ZERO	OFF	ON					
CHARACTER SET	ITALICS	GRAPHICS					
INTL CHAR SET	U.S.A.	FRANCE	GERMANY	U.K.	DENMARK	SWEDEN	ITALY
	SPAIN 1	JAPAN	NORWAY	DENMARK2	SPAIN 2	LATIN AM	LEGAL
	KOREA	NETHER	TURKEY				
CHARACTER SET	SET 1	SET 2					
CODE PAGE	U.S.A.	MULTI	PORTUGAL	CANADA	NORWAY	SCANDINAV	YU ASCII
	LATIN 2	CYRILLIC	RUSSIAN	HUNGARY	KANNICKY	TURKEY	ICELAND
	WELSH	MAZOVIA	UKRAINE	NEW-HEB	OLD-HEB	D-HEB	GRK 437
	GRK 851	ELOT 828	GRK ABC	CYPRUS	MALTA	ARAB NLS	ARAB EXT
	EBCDIC	BR SET1	BR SET2	ISO LTN1	WINDOWS	WIN CYR	WIN EE
	MS SIMPL						
INSTALL 2							
QUIET MODE	OFF	ON					
COPY MODE	NORMAL	COPY 1	COPY 2				
AUTO LF	OFF	ON					
TEAR OFF	OFF	0.3 SEC.	0.5 SEC.	1.0 SEC.			
LOADING	PUSH KEY	0.5 SEC.	1.0 SEC.	2.0 SEC.			
SKEW DETECTION	OFF	ON					
SKEW LEVEL	001	002	003	004	005	006	007
	008	009	010				
PE SENSOR	OFF	ON					
RAM	BUFFER	DOWNLOAD					
SERIAL I/F							
BAUD RATE	19200 BPS	9600 BPS	4800 BPS	2400 BPS	1200 BPS	600 BPS	300 BPS
	110 BPS						
PARITY	NONE	ODD	EVEN				
DATA BIT	8 BIT	7 BIT					
STOP BIT	1 BIT	2 BIT					
PROTOCOL	XON/XOFF	DTR					

Figure 5-2 The Current Setting Report

Changing the Printer Settings

Table 5-2 lists the menus and options in the Setup Menu System and is followed by a description of how to use it.

Options	Description
LANGUAGE	Select the language that you want to use in the Setup Menu System. All following menus are displayed in the language you select.
EMULATION	Use this menu to match the printer driver that you installed on your computer. The default AUTO setting does this automatically, but you can set EPSON or IBM emulations explicitly if you have problems.
FONT	Set the font for the printer to use in the absence of any font control instructions from your software. You can select one draft quality font, or from 8 letter quality fonts.
EMPHASIZED	Select ON or OFF to allow the printer to emphasise your printed text.
PITCH	Set the pitch to determine the horizontal spacing of the printed characters.
FONT LOCK	Select (ON) or cancel (OFF) the font lock option. In the default OFF position, your software controls the fonts of the printed characters. In the ON position, all characters are printed in the font selected in the font menu.
LINE SPACING	Set the vertical spacing of the printed characters. You can set it to either 6 LPI (the default setting) or 8 LPI.
FORM LENGTH	Set the length of your printer paper, for both cut sheets and continuous-feed paper.
PAGE SKIP (in Epson emulation only)	Select (ON) or cancel (OFF, the default) a bottom margin of one inch.
TEXT DIR	Set uni-directional or bi-directional printing for text. Bi-directional (the default) is faster because the print head prints in both directions. Uni-directional is slower but produces better quality printing.
GRAPHIC DIR	Set uni-directional or bi-directional printing for graphics. It is set to UNI-DIR by default for better quality.

Table 5-2 The Setup Menu System

Options	Description
AGM MODE (in IBM emulation only)	Select (ON) or cancel (OFF) AGM mode (Alternate Graphics Mode), which allows IBM 24 pin printers to interpret Epson 9 pin graphics commands properly.
SLASH ZERO	Select (ON) or cancel (OFF) the printing of a slash(/) through zeroes to distinguish them from the letter O.
CHARACTER SET (Epson emulation only)	Select an international character set (see Appendix C for more information).
INTL CHAR SET (in IBM emulation only)	Select character set SET 1 or SET 2.
CHARACTER SET (in IBM emulation only)	Select an IBM code page (see Appendix D). This is a method that IBM compatible PCs use to display and print foreign-language characters.
CODE PAGE	Select an code page (see Appendix D)
QUIET MODE	This select the printers quiet mode. The acoustic noise is lower but the print speed is reduced by half.
COPY MODE	Select between Normal or COPY 1 (increased impact force) and COPY 2 (Increased impact with double pass printing).
AUTO CR (in IBM emulation only)	Select (ON) or cancel (OFF) the automatic return of the print head to the left margin after every line-feed command.
AUTO LF	Select (ON) or cancel (OFF) the automatic advance of the paper by one line after every carriage return command.
TEAR OFF	Enables or Disables tractor paper tear off facility, The feed delay for the tear OFF advance can be set.
LOADING	This determines the printers action for single sheet front feeding. PUSH KEY disables automatic loading allowing loading only by pressing the LF/FF key. The other options allow automatic feeding after the stated delay time.
SKEW DETECTION	Enables or Disables front feed skew detection.
SKEW LEVEL	Sets the Skew sensor sensitivity. 001 is the most critical with 010 the least. If a skew error is detected the single sheet is automatically ejected.

Table 5-2 The Setup Menu System

Options	Description
PE SENSOR	Enable or disables the paper out sensor.
RAM	Enables the printers internal memory to be used for character download or print buffer.
BAUD RATE	Set the printer RS-232 interface speed (<i>Set to the same setting as your PC's RS-232 interface</i>).
PARITY	Set the printers RS-232 interface parity error checking type (<i>Set to the same setting as your PC's RS-232 interface</i>).
DATA BIT	Set the printers RS-232 data width either 8 bits or 7 bits (<i>Set to the same setting as your PC's RS-232 interface</i>).
STOP BIT	Set the printers RS-232 transmission stop bits (Set to the same setting as your PC's RS-232 interface).
PROTOCOL	Set the printers RS-232 interface protocol (handshaking) (<i>Set to the same setting as your PC's RS-232 interface</i>).

Table 5-2 The Setup Menu System

To use the Setup Menu System:

1. Lift the top cover of the printer.
2. Eject any paper currently in the printer (or park tractor paper) then switch the printer on line.
3. Press and hold down the **PARK/LOAD** key for 3 seconds.

This starts the Setup Menu System and prints the instructions for using it. The current setting is underlined.

The print head points to the first selection in the menu:

4. Make a selection from the menu using the control panel keys:

Press:	To:
PARK/LOAD	Move the print head to the next menu selection. Repeat the process to move the print head until it is at the selection that you want.
LF/FF	Save the setting that is currently selected by the print head, and move to the next menu.
ON LINE	Move to the next menu without altering the current setting.

5. When you have made all of your changes (remember that you don't have to do through the entire menu system), switch the printer off and then back on again.

Each time you switch the printer on, it uses the new saved settings. keep the print-out the menu selections so that you know what the current settings are.

Reverting to Factory Printer Settings

You can revert to the factory printer settings without having to work through the Setup Menu System to reset the menus.

To revert to factory settings:

1. Make sure that the printer is on-line.
2. Press and hold down the **LF/FF**, **PARK/LOAD** and **ON LINE** keys on the control panel for 3 seconds.

The POWER and ON LINE indicator lights on the control panel flash 3 times together and the printer beeps to confirm that the printer has reset.

3. Release the keys and switch the printer off and on again.

When the printer powers on, it is reset to the factory settings

Key Lock Mode

When the key lock mode is selected, the following functions of the printer are disabled.

- LL/FF key
- Setup Menu system (Vue Print Menu system)
- Self test printing
- Default setting report printing
- Demo page printing

To enter Key Lock Mode:

1. Make sure that the printer is on-line.
2. Press and hold down the **PARK/LOAD**, **LF/FF** and **DRAFT/LQ** keys on the control panel for 3 seconds.

The POWER, ON LINE and DRAFT/LQ indicator lights on the control panel flash 3 times together and the printer beeps to confirm that the printer is locked.

To exit Key Lock Mode:

1. Make sure that the printer is on-line.
2. Press and hold down the **PARK/LOAD**, **LF/FF** and **DRAFT/LQ** keys on the control panel for 3 seconds.

The POWER, ON LINE and DRAFT/LQ indicator lights on the control panel flash 3 times to confirm that the printer is unlocked.

Using the Printer's Self-Test Functions

Slide pattern printing test

Continuous print of ASCII slide pattern is performed by turning power on, while pressing the **ON LINE** and **PARK/LOAD** keys.

*****TEST PRINT MODE*****

```
!"#$%&'()*+,-./10123456789;<=>?@ABCDEFGHIJKLMNopQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz
!"#$%&'()*+,-./10123456789;<=>?@ABCDEFGHIJKLMNopQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz
!"#$%&'()*+,-./10123456789;<=>?@ABCDEFGHIJKLMNopQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz
```

Dot alignment Mode

To adjust DP more accurate, press the **ON LINE** and **LF/FF** keys about 3 seconds.

To adjust LQ more accurate, press the **LF/FF** and **DRAFT/LQ** keys about 3 seconds.

When the printer enters dot Alignment Mode, **ON LINE LED** blinks.

In Dot Alignment mode, press the **PARK/LOAD** or **LF/FF** keys for adjusting dot alignment.

PARK/LOAD	: Move the odd line character to the right (User value will be increased.)
LF/FF	: Move the odd line character to the left (User value will be decreased.)
ON LINE	: Save the current setting to EEPROM.

To exit from this mode, turn the printer off.

Hex Dump Mode

Turning power on while pressing the **PARK/LOAD** key, causes the printer to enter Hex Dump mode.

In this mode, if you execute the following program:

```
10 LPRINT CHR$(27);"4";
20 LPRINT "ABCDEFGHIJKLMNopQRSTUVWXYZ"
30 LPRINT CHR$(27);"5";
40 LPRINT "ABCDEFGHIJKLMNopQRSTUVWXYZ"
```

The hex dump printing result will be shown as below.

*****HEXADECIMAL DUMP*****

```
(0000) 1B 34 41 42 43 44 45 46 47 48 49 4A 4B 4C 4D 4E ,4ABCDEFGHIJKLMN
(0010) 4F 50 51 52 53 54 55 56 57 58 59 5A 0D 0A 1B 35 OPQRSTUVWXYZ,,5
(0020) 41 42 43 44 45 46 47 48 49 4A 4B 4C 4D 4E 4F 50 ABCDEFGHIJKLMNop
(0030) 51 52 53 54 55 56 57 58 59 0D 0A QQRSTUVWXYZ,,
```

NOTE

That the printing result will be the following in the normal printing mode.

```
ABCDEFGHIJKLMNopQRSTUVWXYZ
ABCDEFGHIJKLMNopQRSTUVWXYZ
```

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Appendix A

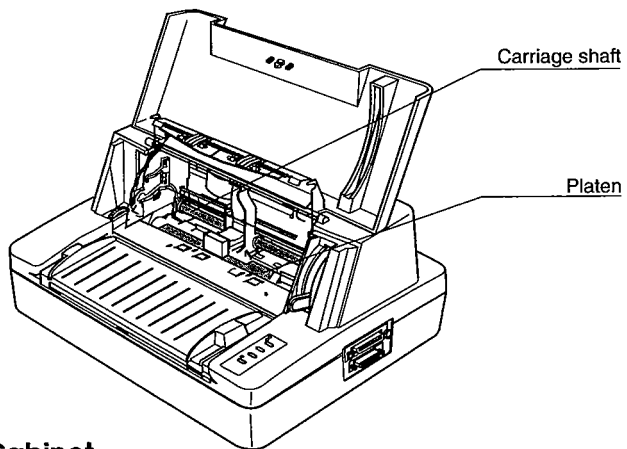
Maintenance and Fault Finding

Introduction

Your printer requires very little routine maintenance. In fact, the best maintenance for the printer is preventative. If you have followed the suggestions for locating it in an area free of excessive dust and heat it will give you a long and trouble-free performance.

Periodic cleaning, replacement of the ribbon, replacement of an occasional blown fuse and, after a very long time, replacement of the print head are about the only maintenance tasks you'll need to carry out. We'll cover these items in this chapter. However, before carrying out any of these tasks make sure that the printer has been switched off.

Cleaning Dirt and dust are the biggest enemies. The print head cover will keep most dirt from the printer mechanism, but occasional cleaning to remove paper particles is a good idea.



Cleaning the Cabinet

Wipe soiled parts of the printer with a clean dry cloth. Remove bits of paper, etc., using tweezers.

NOTE

When cleaning, be careful not to scratch the equipment or to bend parts, etc.

Cleaning the Carriage Shaft

The carriage shaft is coated with oil, which attracts dust, etc. Wipe solid parts with a soft cloth to clean them.

NOTE

Over-application of oil may cause a build up of dust and dirt with resulting printer failure.

Cleaning the Platen

Clean the platen with a soft cloth.

Intervals and Materials for Cleaning

Clean inside the printer in accordance with the following:

NOTE	
<i>Intervals cleaning:</i>	<i>Every 6 month or 300 hours of operation. (whichever comes first)</i>
<i>Materials:</i>	<i>Dry cloth (gauze or soft cloth)</i>

Ribbon Cartridge The inked ribbon in the cartridge is a continuous loop and will print several million characters before needing replacement. When printed characters begin to appear feint it is time to replace the ribbon cartridge.

Replacing the ribbon is a simple matter of taking out the old cartridge and replacing it with a new one. Before removing the old cartridge always turn off the power and allow the print head to cool as it can be extremely hot. Then slide the print head to the left edge to avoid damage to the print head cable. See the ribbon installation section in Chapter 2 for details.

Fuses When nothing seems to work on your printer, and you've checked the electrical socket as well as the printer power switch, it is very likely that that problem is a blown fuse. The printer has one fuse, located inside the printer case. Take your printer to any authorized Service Centre to have the fuse checked and replaced if necessary.

Print Head The print head has a very long life. You will know that it needs replacement when printed characters are feint, even with a new ribbon cartridge. To replace the print head start by opening the top cover and the ribbon cartridge.

Pinching the claws is rather difficult as they cannot see. However, you can easily pull out the Print Head by using the Head Removal Tool. (This Tool is attached to the Print Head which is ordered as spare parts). Gently attach the Head Removal Tool to the Print Head by pressing it toward the Print Head as shown in the figure A-1. Then, pull it out to remove the Print Head.

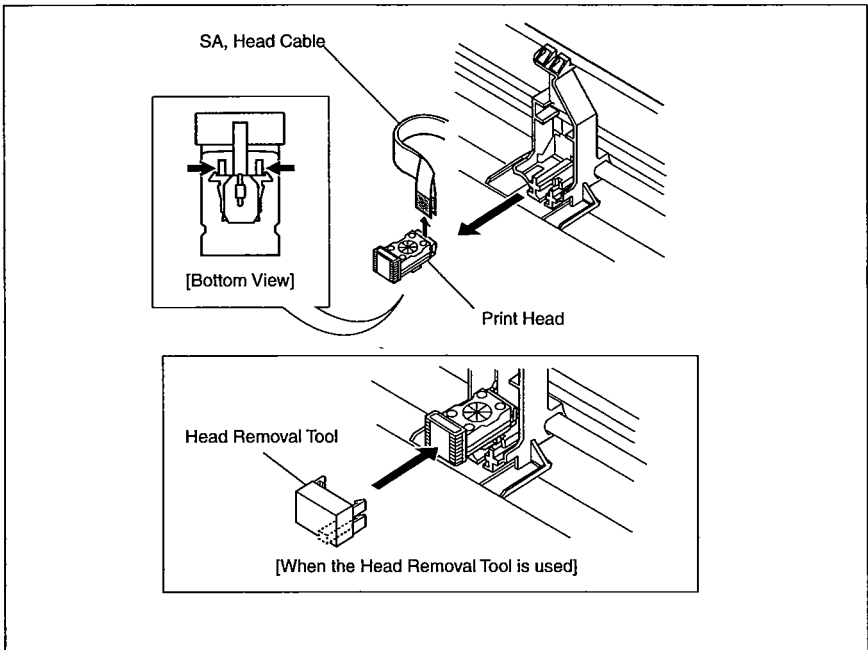


Figure A-1 Replacing The Print Head

Attach the cable connector to the new print head. Position the print head in the head guide and press down until it clicks securely into place (see Figure A-1).

Problems And Solutions

The following are some of the common problems which you may encounter when using the printer. By implementing the solutions suggested, you should be able to resolve them.

Printer is “Dead” No Lights, No Action Make sure that it is plugged in. Check both ends of the power cable. Make sure the power switch is turned on. Test the socket with another appliance to make sure it is working, check the fuse in the plug attached to the power cable. Take your printer to your dealer to be serviced.

Printer Won’t Work Be sure that the printer cable is plugged into both the printer and the computer. Make sure that there is paper inserted and the on line lights is on. Ensure that the top cover is firmly in place.

Printing is Feint Be sure that the ribbon cartridge is installed correctly. It must be fitted securely into place and the ribbon must pass between the print head and the ribbon mask. Adjust the paper thickness lever (move it towards the rear of the printer) Replace the ribbon. Replace the print head.

Printing is Smudged The ribbon is in front of the ribbon mask. Remove it and then insert it correctly. Adjust the paper thickness lever (move it towards the front of the printer).

Printing Starts in the Middle of A Page Turn printer off and use the paper feed knob to align the perforation between forms with the top of the print head or the tear off edge on the top cover. Then turn the printer on. Don't use the paper feed move the paper when the printer is on line as this makes the printer lose track of the paper location. Also, make sure you advance the top of a form (turn the printer off line and hold down the LF/FF key) before you turn the printer off or before starting to print one of your programs. The printer assumes that the paper location at the start of a print is the "top of form" whether it's true or not!

Characters On The Screen Don't Match The Printed Characters Many graphics characters and special symbols are produced by different ASCII codes on each make of computer and printer. Compare the character set charts in your computer manual with the printer character sets.

You Selected A Printer Driver In Your Application Program But The Codes Don't Do The Right Thing (Or Anything) On The Printer Contact your software manufacture to check if a driver for your printer is available. Make sure you selected the same emulation on the printer as you did with your program.






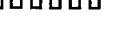



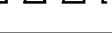
The Paper Jams Frequently When Using Continuous Forms Move the paper select lever to the PIN position. Make sure that the incoming and outgoing paper is straight. Be sure that the Incoming paper is not sticking.

The Paper Jams When Doing Reverse Paper Feeds Be sure that the lid is shut correctly. Don't tear off continuous forms while you are printing. With wider paper the right edge of the first page may not be flat against the platen. Increase the top margin or advance to the second sheet before you start printing.

Misaligned Printing Or Irregular LQ Printing, Especially At The Ends Of Lines With Push Tractor Or Friction Feed Be sure that the lid is correctly shut. Don't tear off continuous forms while you are printing. With wider paper the right edge of the first page may not be flat against the platen, increase the top margin or advance to the second sheet before you start printing.

Error LED on the Control Panel

In case of printer error, the printer enters off line state and indicates an alarm by blinking the LEDs as shown below.

LED	Error	Cause	Remedy
POWER ON OFF  ON LINE ON OFF 	Paper empty or paper jam	The printer is out of paper or jamming	Load paper or remove the jammed paper.
POWER ON OFF  ON LINE ON OFF 	Paper slant	The inserted cut sheet paper is slanting.	Re-insert the cut sheet paper correctly.
POWER ON OFF  ON LINE ON OFF 	Home position error	The Print head carrier mechanism is mispositioned.	Turn off the power and turn it on again. If an error still occurs, clean and lubricate the carriage shaft.
POWER ON OFF  ON LINE ON OFF 	Select lever error	The select lever is changed after loading paper.	Return the select lever to the correct position.
POWER ON OFF  ON LINE ON OFF 	Head hot	The print head is hot.	Automatically cleared when print head temperature decreases.

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Appendix B

Specifications

Basic Specifications

General

Type	24-Pin Flatbed Dot Matrix Impact Printer				
Fonts	CTZ ROMAN, CTZ SANSERIF, CTZ COURIER, CTZ PRESTIGE, CTZ ORATOR, CTZ SCRIPT, CTZ OCRA, CTZ OCRB				
Emulation	Epson LQ570, LQ860 IBM Proprinter X24e BAR CODE emulation				
Memory	128k byte (*Input buffer: 96K byte)				
Interface	Centronics (IEEE 1284 Compatible) RS-232C Serial				
Ribbon	Colour :	Black			
	Life :	2 million characters (draft mode)			
Power requirements	230V ± 10%				
Power consumption	Voltage	Operation	Operation (Max.)	Standby	15 minutes after entering standby
	220V	79.2W	198W	11.3W	5.1W
	240V	81.6W	180W	11.8W	5.4W
Environmental conditions	Operating temperature		5°C ~ 35°C		
	Operating humidity		10% ~ 80% RH (Non condensing)		
	Storage temperature		-20°C ~ 55°C		
	Storage humidity		5% ~ 85% RH (Non condensing)		
Acoustic noise	The average sound pressure level is as follows in accordance with ISO7779: • 55 dB(A) at LQ mode • 53 dB(A) at LQ quiet mode				
Weight (unpacking)	Approx. 5.7 kg (12.6lbs.)				
External dimensions (without optional front table extension tray)	417 x 325 x 205 mm (width/depth/height) (16.2 x 12.8 x 8.1 inch)				

Print Head

Print head wire diameter	0.2 mm
Wire pitch	1/180 inch
Print head life	200 million dots/wire

Mechanism

Print speed	200 cps (characters per second) in draft printing mode (1/120") 66 cps in letter quality printing mode (1/360")
Line feed	Speed: 3.25 ips (inches per second) Pitch: Variable in 1/360 inch increments
Number of columns	80 columns (10 cpi)
Copy capability	Original + 3 copies (1 sheet is 0.06mm) – 1 pass-printing Original + 6 copies (1 sheet is 0.06mm) – 2 pass-printing
Head gap adjustment	Manual
Resolution	1/360 dpi both vertical and Horizontal

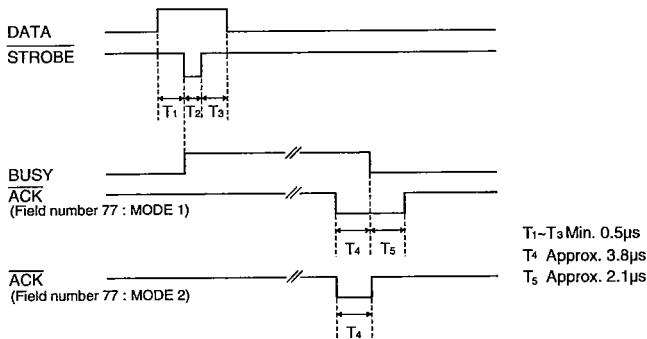
Paper

Paper size	Cut sheet:	Width: 89 to 257 mm (3.5 to 10.1 inches) Length: 56 to 537 mm (2.2 to 21.1 inches)
	Fanfold:	Width: 102 to 257 mm (4.0 to 10.1 inches)
Paper thickness		Paper weight: 45 ~ 85gsm(13.9 ~25.3 lb) Paper thickness: 0.06 ~ 0.065mm(Total: 0.45mm)
Paper type		Cut sheet, tractor paper, label, cheque, post card, and envelope
Paper feed mechanism		Friction: manual insertion from the front table, ejection to the front Tractor: insertion from the rear, ejection to the front, with tear-off and paper park functions
Reliability	MTBF	5000 Power on hour (excluding Print Head)
	MTTR	20 minutes
Safety Standard		EN60950/EN55022, EN50082-1

Parallel Interface

Timing and Signal Levels

Timing



Signal level

Input High level: 2 to 5V, Low level: 0 to 0.8V
Output High level: 2.4 to 5V, Low level: 0 to 0.4V

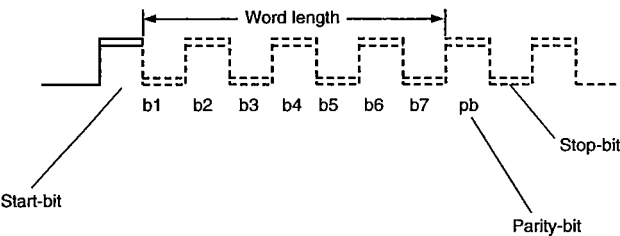
Connector Pin Assignments

Signal Pin No.	Return Line Pin No.	Signal Name	Signal Direction
1	19	STROBE	Printer ← Host
2 ~ 9	20 ~ 27	DATA	Printer ← Host
10	28	ACK	Printer → Host
11	29	BUSY	Printer → Host
12	30	PE	Printer → Host
13	_____	SELECT	Printer → Host
14	_____	AUTO FEED	Printer ← Host
15	_____	NC	NC
16	_____	SIGNAL GND	Printer ↔ Host
17	_____	CHASSIS GND	Printer ↔ Host
18	_____	+5V	Printer → Host
31	_____	PRIME	Printer ← Host
32	_____	ERROR	Printer → Host
33	_____	SIGNAL GND	Printer ↔ Host
34	_____	NC	Printer → Host
35	_____	PULLED UP 5V	Printer → Host
36	_____	SELECT IN	Printer ← Host

Serial Interface

Serial Interface Specifications

Method of data in/out	7-bit or 8-bit serial interface.	
Data input code	ASCII, JIS 7-bit or 8-bit, international character code, and CG and dot-based graphic codes (8-bit) based on graphic symbol codes.	
Data buffer	Max. 96K bytes	
Signal level	RS-232C: $\pm 12V$	
Data transmission speed (Baud Rate)	RS-232C	: 110, 300, 600, 1200, 2400, 4800, 9600, 19200 bps
Data protocol	RS-232C	: READY/BUSY (DTR) or X-ON/X-OFF
Sync system	START BIT: 1 bit STOP-BIT: 1 or 2 bits	



Word length 7 bits or 8 bits

Connector Pin Assignments

RS-232C Factory Configuration

PIN NO	Abbrev	Name	Direction	RDY/ BSY	X-ON/ X-OFF
1	FG	Frame ground	—	O	O
2	SD	Send data	OUT	X	O
3	RD	Received data	IN	O	O
4	RTS	Request to send	OUT	*	*
7	SG	Signal ground	—	O	O
20	DTR	Data terminal ready	OUT	O	O

O: Used X: Not Used *: Not actively supported; forced high

Description of Signals

The signal levels of RS-232C are defined at the connector pins.

1 = Low (Mark): -25 to -3V

0 = High (Space): +3 to +25V

■ ***RDY/BSY System (RS-232C)***

- | | |
|--------|--|
| Pin 1 | FG (Frame ground)
Safety electrical ground |
| Pin 3 | RD (Received data)
Serial data is received from the host computer over this line. (The) Host must be set to the MARK (Low) state when not transmitting. |
| Pin 7 | SG (Signal ground)
Signal ground |
| Pin 20 | DTR (Data terminal ready)
SPACE (High) when the printer is ready to receive data. MARK (Low) when the printer is not ready to receive. |

■ ***X-ON/X-OFF System (RS-232C)***

- | | |
|--------|--|
| Pin 1 | FG (Frame ground)
Safety electrical ground |
| Pin 2 | SD (Send data)
Serial data is sent to the host computer over this line. Set to the MARK (Low) state when not transmitting. |
| Pin 3 | RD (Received data)
Serial data is received from the host computer over this line. (The) Host must be set to the MARK (Low) state when not transmitting. |
| Pin 4 | RTS (Request to send)
Output signal from the printer. The signal level is SPACE (High) when the printer is on. |
| Pin 7 | SG (Signal ground)
Signal ground |
| Pin 20 | DTR (Data terminal ready)
Output signal from the printer. The signal level is SPACE (High) when the printer is on. |

Appendix C

Printer Options

Your printer may be further enhanced by various options. These are detailed in this chapter.

Front table extension tray

The front table extension tray adds extra depth to the printers. Single sheet front feed, enabling the feeding of long or heavy media.

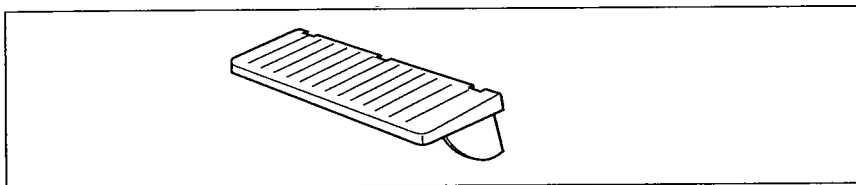


Figure C-1 Front table extension tray

Simply attach it to the printers front extension tray by locating the 3 support lugs in the 3 slots at the edge of the printer front feed.

Printer Stand

There is an optional printer stand available. Of robust plastic construction, it matches the colour of the printer. It consists of three pieces - a front piece with a pocket for manuals and two side pieces. They slot together at the front (see Figure C-2).

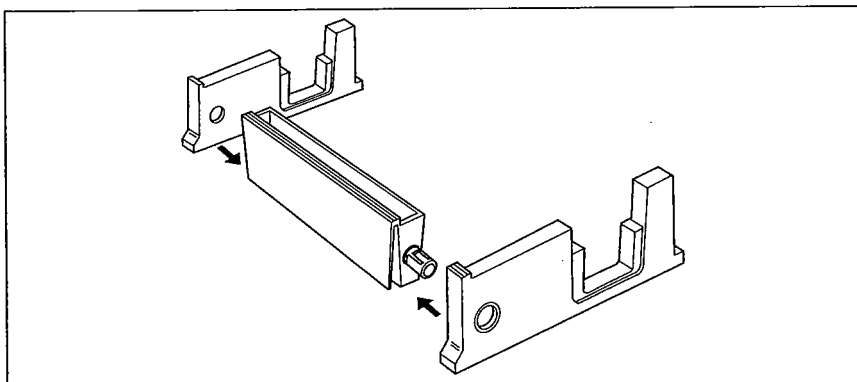


Figure C-2 Assembling the printer stand

Reference Section 1

Character Sets

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 *Code page 864-Arabic Extend
 *Code page - Hungarian
 *Code page - Mazovia
 *Code page - Ukrainian
 *CTZ YUASCII
 *CTZ NEW-Hebrew
 *CTZ Old Hebrew
 *CTZ ELOT 928
 *CTZ MALTA
 *CTZ CYPRUS

Note: (*) maked code page sample is not displayed in this manual.

Epson Italic Character Table

◀———— Italic Character ———▶

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	NUL		SP	0	*	P	*	p	NUL		SP	0	*	P	*	p
1		DC1	!	1	A	Q	a	q		DC1	!	1	A	Q	a	q
2		DC2	"	2	B	R	b	r		DC2	"	2	B	R	b	r
3		DC3	*	3	C	S	c	s		DC3	*	3	C	S	c	s
4		DC4	*	4	D	T	d	t		DC4	*	4	D	T	d	t
5			%	5	E	U	e	u			%	5	E	U	e	u
6			&	6	F	V	f	v			&	6	F	V	f	v
7	BEL		'	7	G	W	g	w	BEL		'	7	G	W	g	w
8	BS	CAN	(	8	H	X	h	x	BS	CAN	(	8	H	X	h	x
9	HT		)	9	I	Y	i	y	HT		)	9	I	Y	i	y
A	LF		*	:	J	Z	j	z	LF		*	:	J	Z	j	z
B	VT	ESC	+	;	K	*	k	*	VT	ESC	+	;	K	*	k	*
C	FF		,	<	L	*	l	*	FF		,	<	L	*	l	*
D	CR		-	=	M	*	m	*	CR		-	=	M	*	m	*
E	SO		.	>	N	*	n	*	SO		.	>	N	*	n	*
F	SI		/	?	O	_	o	DEL	SI		/	?	O	_	o	DEL

Epson Graphic Character Table

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	NUL		SP	0	@	P	`	p	Ç	É	á	☐	ℒ	ℒ	α	≡
1		DC1	!	1	A	Q	a	q	ü	æ	í	☐	⊥	≡	β	±
2		DC2	"	2	B	R	b	r	é	Æ	ó	☐	⊥	≡	Γ	≥
3	♥	DC3	#	3	C	S	c	s	â	ô	ú	|	⊥	≡	π	≤
4	♦	DC4	\$	4	D	T	d	t	ä	ö	ñ	⊥	—	≡	Σ	ƒ
5	♣	§	%	5	E	U	e	u	à	ò	Ñ	⊥	⊥	≡	σ	∫
6	♠		&	6	F	V	f	v	â	û	a	⊥	⊥	≡	μ	÷
7	BEL		'	7	G	W	g	w	ç	ù	ø	⊥	⊥	⊥	τ	≈
8	BS	CAN	(	8	H	X	h	x	ê	ÿ	¿	⊥	⊥	⊥	Φ	°
9	HT		)	9	I	Y	i	y	ë	Ö	⊥	⊥	⊥	⊥	Θ	•
A	LF		*	:	J	Z	j	z	è	Ü	⊥	⊥	⊥	⊥	Ω	.
B	VT	ESC	+	;	K	[	k	{	ï	ø	½	⊥	⊥	■	δ	√
C	FF		,	<	L	\	l	|	î	£	¼	⊥	⊥	■	∞	∞
D	CR		-	=	M	]	m	}	ì	¥	⅓	⊥	⊥	■	∅	₂
E	SO		.	>	N	^	n	~	Ä	Pt	«	⊥	⊥	■	ε	■
F	SI		/	?	O	_	o		Å	f	»	⊥	⊥	■	∩	SP

Epson International Italic Character Table

Character Set	Character Code (Hex)											
	23	24	40	5B	5C	5D	5E	60	7B	7C	7D	7E
0: U. S. A.	#	\$	@	[	\	\]	^	`	{	|	}	~
1: FRANCE	#	\$	à	°	ç	§	^	`	é	ù	è	~
2: GERMANY	#	\$	§	Ä	Ö	Ü	^	`	ä	ö	ü	ß
3: U. K.	£	\$	@	[	\	\]	^	`	{	|	}	~
4: DENMARK 1	#	\$	@	Æ	Ø	Å	^	`	æ	ø	å	~
5: SWEDEN	#	□	É	Ä	Ö	Å	Ü	é	ä	Ö	å	ü
6: ITALY	#	\$	@	°	\	é	^	ù	à	ò	è	ì
7: SPAIN 1	Pt	\$	@	¡	Ñ	¿	^	`	ñ	ñ	}	~
8: JAPAN	#	\$	@	[	¥	]	^	`	{	|	}	~
9: NORWAY	#	□	É	Æ	Ø	Å	Ü	é	æ	Ø	å	ü
10: DENMARK 2	#	\$	É	Æ	Ø	Å	Ü	é	æ	Ø	å	ü
11: SPAIN 2	#	\$	á	¡	Ñ	¿	é	`	í	ñ	ó	ú
12: LATIN AMERICA	#	\$	á	¡	Ñ	¿	é	ü	í	ñ	ó	ú
13: KOREA	#	\$	@	[	₩	]	^	`	{	|	}	~
64: LEGAL	#	\$	§	°	'	"	¶	`	©	®	†	™
65: NETHERLANDS	#	\$	@	[	IJ	]	^	`	{	ij	}	~
66: FRENCH CANADA	#	\$	à	â	ç	ê	î	ô	é	ú	è	û
67: FRANCE 2	#	â	à	î	ç	ê	î	ô	é	ú	è	ï
68: U.K. 2	#	£	@	[	\	\]	^	`	{	|	}	~
69: TURKEY	±	ı	Ç	Ş	Ö	Ğ	Ü	ç	ş	Ö	ğ	ü
70: AFRICA	#	ê	É	Ê	ö	è	Ü	é	ë	ö	ô	ü

All Character Set Table (ASCII Values in HEX)

All Character Set can be selected by ESC \ or ESC ^.

Code page 437 -US

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	Ø	►	SP	0	@	P	`	p	Ç	É	á	▩	┐	└	α	≡
1	☺	◄	!	1	A	Q	a	q	ü	æ	í	▨	┌	┘	β	±
2	☹	↕	"	2	B	R	b	r	é	Æ	ó	▧	┴	┴	Γ	≥
3	♥	||	#	3	C	S	c	s	â	ô	ú	|	┴	┴	π	≤
4	♦	¶	\$	4	D	T	d	t	ä	ö	ñ	└	—	└	Σ	┐
5	♣	§	%	5	E	U	e	u	à	ò	Ñ	┐	┐	┐	σ	┐
6	♠	_	&	6	F	V	f	v	å	û	a	┐	┐	┐	μ	÷
7	•	±	'	7	G	W	g	w	ç	ù	o	┐	┐	┐	τ	≈
8	■	↑	(	8	H	X	h	x	ê	ÿ	¿	┐	┐	┐	Φ	°
9	◦	↓	)	9	I	Y	i	y	ë	Ö	┐	┐	┐	┐	Θ	•
A	◼	→	*	:	J	Z	j	z	è	Ü	┐	||	┐	┐	Ω	.
B	♂	←	+	;	K	[	k	{	ï	ø	½	┐	┐	■	δ	√
C	♀	└	,	<	L	\	l	l	î	£	¼	┐	┐	■	∞	"
D	♪	↔	-	=	M	]	m	}	ì	¥	┐	┐	┐	■	∅	²
E	🎵	▲	.	>	N	^	n	~	Ä	Pt	«	┐	┐	■	ε	■
F	☼	▼	/	?	O	_	o	□	Å	f	»	┐	┐	■	∩	SP

Code page 850 -Multinational

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	Ø	►	SP	0	@	P	`	p	Ç	É	á	▩	┐	ø	Ó	-
1	☺	◄	!	1	A	Q	a	q	ü	æ	í	▨	┌	Ð	β	±
2	☹	↕	"	2	B	R	b	r	é	Æ	ó	▧	┴	Ê	Ô	=
3	♥	||	#	3	C	S	c	s	â	ô	ú	|	┴	Ë	Ò	¾
4	♦	¶	\$	4	D	T	d	t	ä	ö	ñ	└	—	È	ø	¶
5	♣	§	%	5	E	U	e	u	à	ò	Ñ	Á	┐	ı	Õ	§
6	♠	_	&	6	F	V	f	v	å	û	a	Â	ā	í	μ	÷
7	•	±	'	7	G	W	g	w	ç	ù	o	À	Ã	î	þ	.
8	■	↑	(	8	H	X	h	x	ê	ÿ	¿	©	┐	İ	Þ	°
9	◦	↓	)	9	I	Y	i	y	ë	Ö	®	≡	┐	┐	Ú	"
A	◼	→	*	:	J	Z	j	z	è	Ü	┐	||	┐	┐	Û	.
B	♂	←	+	;	K	[	k	{	ï	ø	½	┐	┐	■	Û	ı
C	♀	└	,	<	L	\	l	l	î	£	¼	┐	┐	■	ý	³
D	♪	↔	-	=	M	]	m	}	ì	¥	┐	ø	┐	ı	Ý	²
E	🎵	▲	.	>	N	^	n	~	Ä	×	«	¥	┐	ı	-	■
F	☼	▼	/	?	O	_	o	□	Å	f	»	┐	□	■	'	SP

Code page 860 - Portugal

	8	9	A	B	C	D	E	F
0	Ç	É	á	☐	└	┘	α	≡
1	ü	À	í	☐	└	┘	β	±
2	é	È	ó	☐	└	┘	Γ	≥
3	â	ô	ú	|	└	┘	π	≤
4	ä	ö	ñ	└	└	┘	Σ	└
5	à	ò	Ñ	└	└	┘	σ	└
6	â	û	ä	└	└	┘	μ	+
7	ç	ù	ö	└	└	┘	τ	≈
8	ê	ì	ì	└	└	┘	Φ	°
9	ë	Õ	└	└	┘	└	Θ	•
A	è	Ü	└	└	┘	└	Ω	.
B	ï	ø	1/2	└	└	┘	δ	√
C	î	£	1/4	└	└	┘	∞	"
D	ì	Ù	ì	└	└	┘	∅	²
E	Ã	Pt	«	└	└	┘	ε	■
F	Â	Ó	»	└	└	┘	∩	SP

Code page 865 - Norway

	8	9	A	B	C	D	E	F
0	Ç	É	á	☐	└	┘	α	≡
1	ü	æ	í	☐	└	┘	β	±
2	é	Æ	ó	☐	└	┘	Γ	≥
3	â	ô	ú	|	└	┘	π	≤
4	ä	ö	ñ	└	└	┘	Σ	└
5	à	ò	Ñ	└	└	┘	σ	└
6	â	û	ä	└	└	┘	μ	+
7	ç	ù	ö	└	└	┘	τ	≈
8	ê	ÿ	ì	└	└	┘	Φ	°
9	ë	Ö	└	└	┘	└	Θ	•
A	è	Ü	└	└	┘	└	Ω	.
B	ï	ø	1/2	└	└	┘	δ	√
C	î	£	1/4	└	└	┘	∞	"
D	ì	Ø	ì	└	└	┘	∅	²
E	Ã	Pt	«	└	└	┘	ε	■
F	Â	f	»	└	└	┘	∩	SP

Code page 863 - Canada-French

	8	9	A	B	C	D	E	F
0	Ç	É	í	☐	└	┘	α	≡
1	ü	È	í	☐	└	┘	β	±
2	é	È	ó	☐	└	┘	Γ	≥
3	â	ô	ú	|	└	┘	π	≤
4	Â	È	"	└	└	┘	Σ	└
5	à	ï	"	└	└	┘	σ	└
6	¶	û	³	└	└	┘	μ	+
7	ç	ù	—	└	└	┘	τ	≈
8	ê	α	î	└	└	┘	Φ	°
9	ë	Õ	└	└	┘	└	Θ	•
A	è	Ü	└	└	┘	└	Ω	.
B	ï	ø	1/2	└	└	┘	δ	√
C	î	£	1/4	└	└	┘	∞	"
D	=	Ù	3/4	└	└	┘	∅	²
E	Ã	Ù	«	└	└	┘	ε	■
F	§	f	»	└	└	┘	∩	SP

Code page 437 (G) - Greek

	8	9	A	B	C	D	E	F
0	A	P	ι	☐	└	┘	ω	Ω
1	B	Σ	κ	☐	└	┘	α	±
2	Γ	T	λ	☐	└	┘	ε	≥
3	Δ	Υ	μ	|	└	┘	η	≤
4	E	Φ	ν	└	└	┘	ι	└
5	Z	X	ξ	└	└	┘	ι	└
6	H	Ψ	ο	└	└	┘	ο	÷
7	Θ	Ω	π	└	└	┘	ο	≈
8	Ι	α	ρ	└	└	┘	υ	°
9	K	β	σ	└	└	┘	ω	£
A	Λ	γ	ς	└	└	┘	Α	¥
B	M	δ	τ	└	└	┘	Ε	√
C	N	ε	υ	└	└	┘	Η	"
D	Ξ	ζ	φ	└	└	┘	Ι	²
E	O	η	ζ	└	└	┘	Ο	■
F	Π	θ	ψ	└	└	┘	Υ	SP

Code page 851 (G) - Greek

	8	9	A	B	C	D	E	F
0	Ç	ı	ı	␣	␣	Τ	ζ	-
1	ü		ı	␣	␣	Υ	η	±
2	é	Ο	ó	␣	␣	Φ	θ	υ
3	â	ô	υ	|	␣	ψ	ι	φ
4	ã	ö	À	␣	␣	Χ	κ	χ
5	à	Υ	Β	Κ	†	Ω	λ	ς
6	Α	ù	Γ	Λ	Π	α	μ	ψ
7	ç	ù	Δ	Μ	Ρ	β	ν	,
8	ê	Ω	Ε	Ν	␣	γ	ξ	°
9	ë	Ö	Ζ	␣	␣	ο		''
A	è	Ü	Η	␣	␣	π	ω	
B	ĩ	α	½	␣	␣	ρ	υ	
C	î	£	Θ	␣	␣	σ	ύ	
D	Έ	è	Ι	Ξ	=	δ	ς	ώ
E	Ά	η	«	Ο	␣	ε	τ	■
F	Ή	ι	»	Σ	■	'	SP	

Code page 855 - Cyrillic

	8	9	A	B	C	D	E	F
0	ђ	ѡ	а	␣	␣	л	я	-
1	ѣ	Ѣ	А	␣	␣	л	р	ѣ
2	ѓ	Ѣ	Б	␣	␣	м	Р	ѣ
3	ѓ	Ѣ	Б	|	␣	М	с	з
4	ѐ	Ѣ	Ц	␣	␣	н	С	З
5	Ё	Ѣ	ц	х	†	Н	т	ш
6	ε	К	Д	Х	к	о	Т	Ш
7	ε	К	Д	и	К	О	у	э
8	с	У	е	И	␣	П	у	Э
9	С	Ў	Е	␣	␣	␣	ж	Щ
A	і	У	Ф	␣	␣	Г	Ж	Щ
B	І	У	ф	␣	␣	■	В	Ч
C	і	Ю	Г	␣	␣	■	В	Ч
D	Ї	Ю	Г	Ѣ	=	П	б	
E	ј	Ѣ	«	Ѣ	␣	Я	б	■
F	Ј	Ѣ	»	|	□	■	Ѣ	SP

Code page 852 - East-Europe

	8	9	A	B	C	D	E	F
0	Ç	É	á	␣	␣	đ	Ó	-
1	ü	Ł	í	␣	␣	Đ	β	"
2	é	Í	ó	␣	␣	Ď	Ô	˘
3	â	ô	ú	|	␣	Ě	Ň	˘
4	ã	ö	À	␣	␣	ď	ń	˘
5	u	Ł	a	Á	†	Ň	ň	ς
6	ć	Į	Ž	Ā	Ā	í	š	÷
7	ç	Ś	ž	Ě	ă	î	ș	,
8	ı	ś	£	Ş	␣	ø	Ř	°
9	ë	Ö	ę	␣	␣	Ů		''
A	Ő	Ü		␣	␣	ř		•
B	ó	Ť	ž	␣	␣	Ů	ú	
C	î	İ	Č	␣	␣	ý	Ř	
D	Ž	Ł	ş	Ž	=	Ť	Ý	ř
E	Ā	×	«	z	␣	Ů	ı	■
F	Ć	č	»	|	□	■	'	SP

Code page 857 - Turkish

	8	9	A	B	C	D	E	F
0	Ç	É	á	␣	␣	o	Ó	-
1	ü	æ	í	␣	␣	a	β	±
2	é	Æ	ó	␣	␣	Ê	Ô	
3	â	ô	ú	|	␣	Ë	Ö	¾
4	ä	ö	ñ	␣	␣	È	õ	¶
5	à	ò	Ñ	Á	†		Õ	ς
6	â	û	Ğ	Â	ã	í	μ	÷
7	ç	ù	ğ	À	Ã	î		,
8	ê	ı	ı	©	␣	İ	×	°
9	ë	Ö	®	␣	␣	Ů		''
A	è	Ü	␣	␣	␣	Ů		•
B	ĩ	ø	½	␣	␣	■	Ü	¹
C	î	£	¼	␣	␣	■	ı	³
D	ı	Ø	ı	¢	=	ı	Ÿ	²
E	Ā	Ş	«	¥	␣	|	—	■
F	Ā	ş	»	|	□	■	'	SP

Code page 864 - Arabic NLS

	8	9	A	B	C	D	E	F
0	°	β		•	ø	ذ	—	ـ
1	•	∞	-	١	ء	ر	ف	ـ
2	•	Φ	ل	٢	آ	ن	ق	ن
3	√	±	£	٣	إ	س	ك	ه
4	☒	½	□	£	ؤ	ش	غ	ه
5	—	¼	ل	٥	ع	ص	م	ى
6	|	≈		٦	ظ	ض	ن	ى
7	+	«		٧	ا	ط	ه	ف
8	+	»	ل	٨	ب	ظ	و	ق
9	+	لا	ب	٩	ة	ع	ى	لا
A	+	لا	ت	ف	ت	غ	ي	لا
B	+		ث	:	ث	:	ض	ل
C	+		,	س	ح	ر	ل	ك
D	+	لا	ج	ش	د	÷	غ	ى
E	+	لا	ح	ص	ذ	×	غ	■
F	+	-	خ	؟	ر	ع	ر	

Code page ISO 8859

	8	9	A	B	C	D	E	F
0				•	À	Đ	à	đ
1			ı	±	Á	Ñ	á	ñ
2			ø	²	Â	Ò	â	ò
3			£	³	Ã	Ó	ã	ó
4			□	'	Ä	Ô	ä	ô
5			¥	μ	Å	Ö	å	ö
6			ı	¶	Æ	Ø	æ	ø
7			§	•	Ç	×	ç	÷
8			"	,	È	Ø	è	ø
9			©	ı	É	Ù	é	ù
A			à	ó	Ê	Ú	ê	ú
B			«	»	Ë	Û	ë	û
C			¬	¼	Ì	Ü	ì	ü
D			—	½	Í	Ý	í	ý
E			®	¾	Î	Þ	î	þ
F			-	¿	Ï	ß	ï	ÿ

Code page 866 - Russian

	8	9	A	B	C	D	E	F
0	A	P	a	☒	Л	л	p	Ё
1	Б	C	б	☒	Л	л	c	ё
2	В	T	в	☒	Т	т	T	ѐ
3	Г	y	г	|	Т	т	y	е
4	Д	Φ	д	+	—	Е	φ	ї
5	E	X	e	+	+	F	x	і
6	Ж	Ц	ж	+	+	Г	ц	ÿ
7	З	Ч	з	+	+	Ч	ч	ÿ
8	И	Ш	и	+	+	Ш	ш	°
9	Й	Щ	й	+	+	Щ	щ	•
A	K	Ъ	k		Л	Г	Ъ	•
B	π	Ы	π	+	+	Ы	√	
C	M	Ь	M	+	+	Ь	N°	
D	H	Э	h	+	+	Э	□	
E	O	Ю	o	+	+	Ю	■	
F	П	Я	п	+	+	Я	SP	

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Reference Section 2

Command Code Summary

Epson Emulation

Name	Code		
	Symbol	Hex.	Dec.
Print and Line Feed Execution			
Carriage Return	CR	0D _h	13 _d
Line Feed	LF	0A _h	10 _d
n/180" Line Feed	ESC J	1B _h 4A _h	27 _d 74 _d
n/180" Reverse Line Feed	ESC j	1B _h 6A _h	27 _d 106 _d
Format Control			
Set 1/8" Line Spacing	ESC 0	1B _h 30 _h	27 _d 48 _d
Set 1/6" Line Spacing	ESC 2	1B _h 32 _h	27 _d 50 _d
Set n/180" Line Spacing	ESC 3	1B _h 33 _h	27 _d 51 _d
Set n/60" Line Spacing	ESC A	1B _h 41 _h	27 _d 65 _d
Set n/360" Line Spacing	ESC +	1B _h 2B _h	27 _d 43 _d
Form Feed	FF	0C _h	12 _d
Set Form Length in Lines	ESC C	1B _h 43 _h	27 _d 67 _d
Set Form Length in Inches	ESC C NUL	1B _h 43 _h 00 _h	27 _d 67 _d 0 _d
Set Form Length in Defined Unit	ESC (C	1B _h 28 _h 43 _h	27 _d 40 _d 67 _d
Select Skip-Over-Perforation	ESC N	1B _h 4E _h	27 _d 78 _d
Cancel Skip-Over-Perforation	ESC O	1B _h 4F _h	27 _d 79 _d
Vertical Tab	VT	0B _h	11 _d
Set Vertical Tab Positions	ESC B	1B _h 42 _h	27 _d 66 _d
Select a VFU Channel	ESC /	1B _h 2F _h	27 _d 47 _d
Set VFU Positions	ESC b	1B _h 62 _h	27 _d 98 _d
Set Right Margin	ESC Q	1B _h 51 _h	27 _d 81 _d
Set Left Margin	ESC l	1B _h 6C _h	27 _d 108 _d
Horizontal Tab	HT	09 _h	9 _d
Set Horizontal Tab Positions	ESC D	1B _h 44 _h	27 _d 68 _d
Set Character Space	ESC SP	1B _h 20 _h	27 _d 32 _d
Set Absolute Horizontal Tab	ESC \$	1B _h 24 _h	27 _d 36 _d
Set Relative Dot Position	ESC \	1B _h 5C _h	27 _d 92 _d
Define Unit	ESC (U	1B _h 28 _h 55 _h	27 _d 40 _d 85 _d
Set Absolute Vertical Print Position	ESC (V	1B _h 28 _h 56 _h	27 _d 40 _d 86 _d
Set Relative Vertical Print Position	ESC (v	1B _h 28 _h 76 _h	27 _d 40 _d 118 _d
Set Form Format	ESC (c	1B _h 28 _h 63 _h	27 _d 40 _d 99 _d
Set Horizontal Motion Index (HMI)	ESC c	1B _h 63 _h	27 _d 99 _d
Set Horizontal/Vertical Skip	ESC f	1B _h 66 _h	27 _d 102 _d

Name	Code		
	Symbol	Hex.	Dec.
Print Mode			
Select Print Quality	ESC x	1B _h 78 _h	27 _d 120 _d
Select Elite Width Mode (12 cpi)	ESC M	1B _h 4D _h	27 _d 77 _d
Cancel Elite Width and 15 cpi Mode (10 cpi)	ESC P	1B _h 50 _h	27 _d 80 _d
Select 15 cpi Mode	ESC g	1B _h 67 _h	27 _d 103 _d
Select/Cancel Proportional Mode	ESC p	1B _h 70 _h	27 _d 112 _d
Select Double Width Mode (one line)	SO	0E _h	14 _d
Select Double Width Mode (one line)	ESC SO	1B _h 0E _h	27 _d 14 _d
Cancel Double Width Mode (one line)	DC4	14 _h	20 _d
Select/Cancel Double Width Mode	ESC W	1B _h 57 _h	27 _d 87 _d
Select Compressed Mode	SI	0F _h	15 _d
Select Compressed Mode	ESC SI	1B _h 0F _h	27 _d 15 _d
Cancel Compressed Mode	DC2	12 _h	18 _d
Select Emphasized Mode	ESC E	1B _h 45 _h	27 _d 69 _d
Cancel Emphasized Mode	ESC F	1B _h 46 _h	27 _d 70 _d
Select Double Strike Mode	ESC G	1B _h 47 _h	27 _d 71 _d
Cancel Double Strike Mode	ESC H	1B _h 48 _h	27 _d 72 _d
Select Italic Mode	ESC 4	1B _h 34 _h	27 _d 52 _d
Cancel Italic Mode	ESC 5	1B _h 35 _h	27 _d 53 _d
Select/Cancel Underline Mode	ESC -	1B _h 2D _h	27 _d 45 _d
Select Superscript /Subscript Mode	ESC S	1B _h 53 _h	27 _d 83 _d
Cancel Superscript/Subscript Mode	ESC T	1B _h 54 _h	27 _d 84 _d
Select Print Mode	ESC !	1B _h 21 _h	27 _d 33 _d
Select/Cancel Double Height Mode	ESC w	1B _h 77 _h	27 _d 119 _d
Select/Cancel Quiet Print Mode	ESC s	1B _h 73 _h	27 _d 115 _d
Select Justification Mode	ESC a	1B _h 61 _h	27 _d 97 _d
Select Character Style	ESC q	1B _h 71 _h	27 _d 113 _d
Define and Apply a Style of Scoring	ESC (-	1B _h 28 _h 2D _h	27 _d 40 _d 45 _d
Print Data as Characters	ESC (^	1B _h 28 _h 5E _h	27 _d 40 _d 94 _d
Character Set			
Select International Character Set	ESC R	1B _h 52 _h	27 _d 82 _d
Select Typestyle	ESC k	1B _h 6B _h	27 _d 107 _d
Select Character Table	ESC t	1B _h 74 _h	27 _d 116 _d
Enable Character Set 2	ESC 6	1B _h 36 _h	27 _d 54 _d
Cancel Command ESC 6	ESC 7	1B _h 37 _h	27 _d 55 _d

Name	Code		
	Symbol	Hex.	Dec.
Assign Character Table	ESC (t	1B _h 28 _h 74 _h	27 _d 40 _d 116 _d
Select Font by Pitch and Point	ESC X	1B _h 58 _h	27 _d 88 _d
Download Character			
Select/Deselect User-Defined Set	ESC %	1B _h 25 _h	27 _d 37 _d
Define Downloaded Characters	ESC &	1B _h 26 _h	27 _d 38 _d
Copy ROM Character Set into RAM	ESC :	1B _h 3A _h	27 _d 58 _d
Bit-Image			
Select Single-Density Graphics Mode	ESC K	1B _h 4B _h	27 _d 75 _d
Select Double-Density Graphics Mode	ESC L	1B _h 4C _h	27 _d 76 _d
Select High-speed, Double-Density Graphics Mode	ESC Y	1B _h 59 _h	27 _d 89 _d
Select Quadruple-Density	ESC Z	1B _h 5A _h	27 _d 90 _d
Graphics Mode			
Select Graphics Mode	ESC *	1B _h 2A _h	27 _d 42 _d
Reassign Graphics Mode	ESC ?	1B _h 3F _h	27 _d 63 _d
Select Graphics Mode	ESC (G	1B _h 28 _h 47 _h	27 _d 40 _d 71 _d
Print Raster Graphics	ESC .	1B _h 2E _h	27 _d 46 _d
Input Data Control			
Cancel Line	CAN	18 _h	24 _d
Delete Character	DEL	7F _h	127 _d
Select Printer	DC1	11 _h	17 _d
Deselect Printer	DC3	13 _h	19 _d
Cancel MSB Control Sequence	ESC #	1B _h 23 _h	27 _d 35 _d
Set MSB to 1	ESC >	1B _h 3E _h	27 _d 62 _d
Reset MSB to 0	ESC =	1B _h 3D _h	27 _d 61 _d
Miscellaneous			
Null	NUL	00 _h	0 _d
Beeper	BEL	07 _h	7 _d
Backspace	BS	08 _h	8 _d
Space	SP	20 _h	32 _d
Initialize Printer	ESC @	1B _h 40 _h	27 _d 64 _d
Select Unidirectional Mode (one line)	ESC <	1B _h 3C _h	27 _d 60 _d
Select Print Direction	ESC U	1B _h 55 _h	27 _d 85 _d

Reference Section 2

Name	Code		
	Symbol	Hex.	Dec.
Additional Commands			
Park/Load Paper	ESC ~ g	1B _h 7E 67 _h	27 _d 126 _d 103 _d
Set Top Margin	ESC ~ V	1B _h 7E _h 56 _h	27 _d 126 _d 86 _d
Set/Reset Slashed Zero	ESC ~ 4	1B _h 7E _h 34 _h	27 _d 126 _d 52 _d
Select Emulation	ESC ~ 5	1B _h 7E _h 35 _h	27 _d 126 _d 53 _d
Bar Code Printing	ESC } R	1B _h 7D _h 52 _h	27 _d 125 _d 82 _d

IBM Emulation

Name	Code		
	Symbol	Hex.	Dec.
Print and Line Feed Execution			
Carriage Return	CR	0D _h	13 _d
Line Feed	LF	0A _h	10 _d
Variable Line Feed	ESC J	1B _h 4A _h	27 _d 74 _d
Reverse Line Feed	ESC]	1B _h 5D _h	27 _d 93 _d
Format Control			
Set 1/8" Line Spacing	ESC 0	1B _h 30 _h	27 _d 48 _d
Invoke Variable Line Spacing	ESC 2	1B _h 32 _h	27 _d 50 _d
Set 7/72" Line Spacing	ESC 1	1B _h 31 _h	27 _d 49 _d
Set n/360" Line Spacing	ESC +	1B _h 2B _h	27 _d 43 _d
Set Graphics Line Spacing	ESC 3	1B _h 33 _h	27 _d 51 _d
Store Text Line Spacing	ESC A	1B _h 41 _h	27 _d 65 _d
Form Feed	FF	0C _h	12 _d
Set Form Length in Lines	ESC C	1B _h 43 _h	27 _d 67 _d
Set Form Length in Inches	ESC C NUL	1B _h 43 _h 00 _h	27 _d 67 _d 0 _d
Set TOF Position	ESC 4	1B _h 34 _h	27 _d 52 _d
Select Skip-Over-Perforation	ESC N	1B _h 4E _h	27 _d 78 _d
Cancel Skip-Over-Perforation	ESC O	1B _h 4F _h	27 _d 79 _d
Set Top/Bottom Margins	ESC [S	1B _h 5B _h 53 _h	27 _d 91 _d 83 _d
Set Left/Right Margins	ESC X	1B _h 58 _h	27 _d 88 _d
Vertical Tab	VT	0B _h	11 _d
Set Vertical Tab Positions	ESC B	1B _h 42 _h	27 _d 66 _d
Set Default Tabs	ESC R	1B _h 52 _h	27 _d 82 _d
Horizontal Tab	HT	09 _h	9 _d
Set Horizontal Tab Positions	ESC D	1B _h 44 _h	27 _d 68 _d
Relative Move In line Forward	ESC d	1B _h 64 _h	27 _d 100 _d
Space Backward	ESC e	1B _h 65 _h	27 _d 101 _d
Set Vertical Units	ESC [\	1B _h 5B _h 5C _h	27 _d 91 _d 92 _d
Set Horizontal/Vertical Skip	ESC f	1B _h 66 _h	27 _d 102 _d
Print Mode			
12 Character per Inch Print	ESC :	1B _h 3A _h	27 _d 58 _d
10 Character per Inch Print	DC2	12 _h	18 _d
Select/Cancel Proportional Mode	ESC P	1B _h 50 _h	27 _d 80 _d
Select Double Width Mode (one line)	SO	0E _h	14 _d

Name	Code		
	Symbol	Hex.	Dec.
Cancel Double Width Mode (one line)	DC4	14 _h	20 _d
Select/Cancel Double Width Mode	ESC W	1B _h 57 _h	27 _d 87 _d
Select Compressed Mode	SI	0F _h	15 _d
Select Emphasized Mode	ESC E	1B _h 45 _h	27 _d 69 _d
Cancel Emphasized Mode	ESC F	1B _h 46 _h	27 _d 70 _d
Select Double Strike Mode	ESC G	1B _h 47 _h	27 _d 71 _d
Cancel Double Strike Mode	ESC H	1B _h 48 _h	27 _d 72 _d
Select/Cancel Underline Mode	ESC -	1B _h 2D _h	27 _d 45 _d
Select/Cancel Overscore Mode	ESC _	1B _h 5F _h	27 _d 95 _d
Select Superscript / Subscript Mode	ESC S	1B _h 53 _h	27 _d 83 _d
Cancel Superscript/Subscript Mode	ESC T	1B _h 54 _h	27 _d 84 _d
Double Height Printing	ESC [@	1B _h 5B _h 40 _h	27 _d 91 _d 64 _d
Select Print Mode	ESC I	1B _h 49 _h	27 _d 73 _d
Select 15 Character Per Inch Print	ESC g	1B _h 67 _h	27 _d 103 _d
Select/Cancel Italic Mode	ESC FS I	1B _h 1C _h 49 _h	27 _d 28 _d 73 _d
Character Set			
Select Character Set 2	ESC 6	1B _h 36 _h	27 _d 54 _d
Select Character Set 1	ESC 7	1B _h 37 _h	27 _d 55 _d
Print From All Characters Set	ESC \	1B _h 5C _h	27 _d 92 _d
Print One Char. From All Char. Set	ESC ^	1B _h 5E _h	27 _d 94 _d
Select Typestyle	ESC k	1B _h 6B _h	27 _d 107 _d
Select Code Page	ESC [T	1B _h 5B _h 54 _h	27 _d 91 _d 84 _d
Download Character			
Character Font Image Download	ESC =	1B _h 3D _h	27 _d 61 _d
Bit-Image			
Select Graphics Mode	ESC *	1B _h 2A _h	27 _d 42 _d
Select Single-Density Graphics Mode	ESC K	1B _h 4B _h	27 _d 75 _d
Select Double-Density Graphics Mode	ESC L	1B _h 4C _h	27 _d 76 _d
Select High-speed, Double-Density Graphics Mode	ESC Y	1B _h 59 _h	27 _d 89 _d
Select Quadruple-Density Graphics Mode	ESC Z	1B _h 5A _h	27 _d 90 _d
Select High Resolution Graphics Mode	ESC [g	1B _h 5B _h 67 _h	27 _d 91 _d 103 _d
Input Data Control			
Cancel Line	CAN	18 _h	24 _d

Name	Code		
	Symbol	Hex.	Dec.
Select Printer	DCI	11 _h	17 _d
Deselect Printer	ESC Q	1B _h 51 _h	27 _d 81 _d
Stop Printing	ESC j	1B _h 6A _h	27 _d 106 _d
Miscellaneous			
Null	NUL	00 _h	0 _d
Beeper	BEL	07 _h	7 _d
Backspace	BS	08 _h	8 _d
Space	SP	20 _h	32 _d
Initialize Printer	ESC @	1B _h 40 _h	27 _d 64 _d
Select/Cancel Auto LF Mode	ESC 5	1B _h 35 _h	27 _d 53 _d
Select Print Direction	ESC U	1B _h 55 _h	27 _d 85 _d
Select Initial Condition	ESC [K	1B _h 5B _h 4B _h	27 _d 91 _d 75 _d
Additional Commands			
Park/Load Paper	ESC ~ g	1B _h 7E 67 _h	27 _d 126 _d 103 _d
Set Top Margin	ESC ~ V	1B _h 7E _h 56 _h	27 _d 126 _d 86 _d
Set/Reset Slashed Zero	ESC ~ 4	1B _h 7E _h 34 _h	27 _d 126 _d 52 _d
Select Emulation	ESC ~ 5	1B _h 7E _h 35 _h	27 _d 126 _d 53 _d
Bar Code Printing	ESC } R	1B _h 7D _h 52 _h	27 _d 125 _d 82 _d

Unique Commands

The following commands are in both emulations

Park/Load Paper — ESC ~ g n

Format: 1B_h 7E_h 67_h n (loads : n = 1_d or 49_d, feeds : n = 0_d or 48_d)

Loads fanfold paper when n is set to 1, or feeds fanfold paper to the parked position when n is set to 0.

When the fanfold paper is at the parked position, this command with n set to 0 is ignored.

Set Top Margin — ESC ~ V n

Format: 1B_h 7E_h 56_h n (0_d ≤ n ≤ 120_d)

Sets the distance between the paper end and the print start position to n/60 inch.

Set/Reset Slashed Zero — ESC ~ 4 n

Format: 1B_h 7E_h 34_h n (slashed : n = 1_d or 49_d, unslashed : n = 0_d or 48_d)

Prints slashed zero character (0) or unslashed zero character (0).

Select Emulation — ESC ~ 5 n

Format: 1B_h 7E_h 35_h n (IBM : n = 1_d or 49_d, Epson : n = 0_d or 48_d)

Selects emulation Epson or IBM.

Bar Code Printing — ESC } n R k m₁ m₂ v₁ v₂ c data

Format: 1B_h 7D_h n 52_h k m₁ m₂ v₁ v₂ c data

Selects barcode printing. n indicates the number of bytes contained in the command except ESC }. This includes n itself and the terminating ' R ' character. If any error is detected in the command, the n bytes of data following the ESC } will be discarded. See the descriptions of the different barcode types for additional information.

k selects the type of barcode to be printed according to the table below. Any value other than those shown cause the command to be ignored and the n bytes following ESC } to be discarded from the buffer.

k	: type
B1 _h	: NW-7
B2 _h	: EAN-13
B3 _h	: EAN-8
B4 _h	: Code 39
B5 _h	: Industrial 2 of 5
B6 _h	: Interleaved 2 of 5
BE _h	: Code 128 B
BF _h	: Code 128 C

$(m_1 \times 256_d) + m_2$ ($m = (m_1 \times 256_d) + m_2$) selects the width of a narrow element (bar or space.) This value must be selected from the table below. Any value other than those shown causes the command to be ignored and the n bytes following ESC } to be discarded from the buffer.

m	type
0 _d	Default setting (2 dot columns)
16 _d	2 dot columns (2/180th inch)
24 _d	3 dot columns (3/180th inch)
32 _d	4 dot columns (4/180th inch)

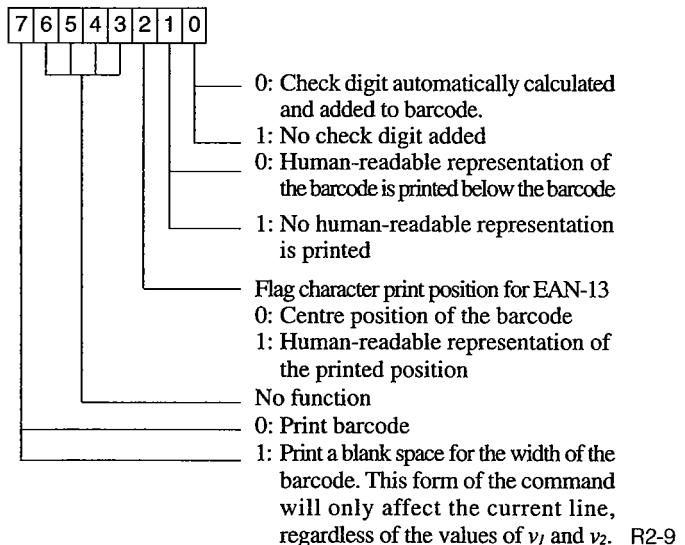
$(v_1 \times 256_d) + v_2$ ($v = (v_1 \times 256_d) + v_2$) specifies the height of the barcode in 1440ths of an inch. This value must be between 192_d and 4095_d. If it is less than 192_d or greater than 4095_d, it will be treated as 192. Further, v must be evenly divisible by 8_d, leaving no remainder. If it is not, the value of v will be rounded down to the nearest value that is evenly divisible.

For example, assume that v is to be set to 350_d. This means v_1 must be set to 1 and v_2 to 94 ($(1 \times 256) + 94 = 350$). 350/1440 is equivalent to 43.75/180. So the actual height of the barcode will be 43/180, or 344/1440. This behaviour stems from the physical limitations of the printer's resolution: the print head pins are 1/180th of an inch apart and the smallest possible paper feed motion is also 1/180th of an inch.

When the barcode height is set to a value greater than 192/1440, the first 192/1440 inch will print on the current line. The remaining height is 'scheduled' to print on subsequent lines as the print position moves down the page. As the print position moves a distance equal to or greater than an additional 192/1440 inch, the next strip of the barcode will print, directly below the previous one. The process is repeated until the entire barcode is printed.

If the subsequent lines also contain text, room for the barcode can be reserved in each affected line by resending the barcode command at the appropriate position in the text, but with bit 7 of element c set to 1. This causes the printer to skip over a distance equal to the width of the barcode specified in the command. The example following this section will help clarify this.

The value of c is determined from the table below:



Reference Section 2

1. When the NW-7 barcode type is selected, no check digit is added, regardless of the setting of bit 0.

If the barcode specified would exceed the right margin, it will not be printed and the *n* bytes following **ESC }** will be discarded from the buffer.

If the barcode specified would exceed the bottom margin, only that portion which will fit above the margin will be printed. The printer can keep track of up to four barcodes simultaneously. If four barcodes are currently being printed and have not been completed, a new barcode command will be ignored, and the *n* bytes following **ESC }** will be discarded from the buffer. If the printer is set to off-line while printing a barcode, and paper movement or pitch change is performed from the front panel, the unfinished portion of the barcode will not be printed when the printer is placed on-line again. Barcodes are always printed unidirectionally, in two passes.

Example (Basic Format):

```
100 LPRINT " ABCDE ";
110 LPRINT CHR$(27) " } " CHR$(17) " R";
120 LPRINT CHR$(&HB1)CHR$(0)CHR$(24)CHR$(2)CHR$(0)CHR$(&H10)"123456789";
130 LPRINT " FGHIJ"
140 LPRINT
150 LPRINT " OPQRS";
160 LPRINT CHR$(27) " } " CHR$(17) " R";
170 LPRINT CHR$(&HB1)CHR$(0)CHR$(24)CHR$(2)CHR$(0)CHR$(&H90)"123456789";
180 LPRINT " TUVWX "
190 LPRINT
```

This example first prints a line (lines 100-130) containing an NW-7 barcode [CHR\$(&HB1)], with a narrow element width of 3 dot columns [(CHR\$(0) x 256) + CHR\$(24)] which extends for 512/1440 inch [(CHR\$(2) x 256) + CHR\$(0)] or about 3/8 inch. The text printed by this line prints ABCDE, the first pass of the barcode, then FGHIJ. The next print line (140) contains no text, but since the barcode is not completely printed, the printer prints its next pass.

The next print line (150-180) contains text that must print on either side of the barcode, directly underneath ABCDE and FGHIJ. TUVWX is positioned properly by resending the barcode command, but with the control byte changed to 90_h from 10_h. This causes the printer to skip horizontally a distance equal to the width of the specified barcode. This form of the command does not cause any printing by itself, but since there is still more of the original barcode left to print, it prints in the space left by this command. The last line (190) contains no new text, except the last pass of the original barcode prints.

Barcode Details

Barcode data is printed on the page according to the diagram below:

s	d	d	d	...	d	c	s
c	1	2	3	...	k	d	c

sc: start/stop code (optional depending on barcode type)

d₁...d_k: barcode data

cd: check digit (optional depending on barcode type)

The start/stop code and check digit may or may not be present, depending on the settings in element *c*, or the requirements of the particular barcode type being printed.

NW-7

The barcode data can consist of 1 to 34 characters, so the valid range for *n* is from 9 to 42. If *n* < 9 or *n* > 42, the command will be ignored and the *n* bytes following **ESC** } will be discarded from the buffer.

Legal DATA characters: 0 - 9, +, -, \, ., /, , :

Legal START/STOP characters: A, B, C, D, E, N, T, *

If any illegal characters are encountered, the command will be ignored and the *n* bytes following **ESC** } will be discarded from the buffer. No check digit is defined for this type of barcode, so a check digit will not be printed, regardless of the setting of bit 0 of element *c* of the command.

CODE 39

The barcode data can consist of 1 to 32 characters if no check digit is selected (bit 0 of element *c*), or 1 to 31 characters if a check digit is selected. Therefore the valid range for *n* is from 9 to 40 with no check digit, or 9 to 39 with a check digit. If *n* < 9 or *n* > the maximum value, the command will be ignored and the *n* bytes following **ESC** } will be discarded from the buffer.

Legal DATA characters: 0 - 9, A - Z, +, -, %, \$, ., <<space>>

The **START/STOP** character “*” will automatically be added to the beginning and the end of the data. If printing of a human-readable representation is specified (bit 1 of *c*), the **START/STOP** characters will also be printed with the data. If any illegal characters are encountered, the command will be ignored and the *n* bytes following **ESC** } will be discarded from the buffer.

How to calculate the check digit:

1. Using the table of the next page, add up the values of all the characters in the barcode data.
2. Divide the result by 43. The check digit is the one corresponding to the value of the remainder from the division.

For example:

assume barcode data of **CLABK 13001**. The sum of the value(s) of the characters is 12 + 21 + 10 + 11 + 20 + 1 + 3 + 0 + 0 + 1 = 79. 79/43 = 1 with a remainder of 36. The check digit is the character with the value of 36, or “-”.

Code 39 Character Values

Character	Value	Character	Value	Character	Value	Character	Value	Character	Value
0	0	A	10	K	20	U	30	/	40
1	1	B	11	L	21	V	31	+	41
2	2	C	12	M	22	W	32	%	42
3	3	D	13	N	23	X	33		
4	4	E	14	O	24	Y	34		
5	5	F	15	P	25	Z	35		
6	6	G	16	Q	26	-	36		
7	7	H	17	R	27	.	37		
8	8	I	18	S	28	<<space>>	38		
9	9	J	19	T	29	\$	39		

INDUSTRIAL 2 OF 5

The barcode data can consist of 1 to 32 characters if no check digit is selected (bit 0 of element c), or 1 to 31 characters if a check digit is selected. Therefore the valid range for n is from 9 to 40 with no check digit, or 9 to 39 with a check digit. If $n < 9$ or $n >$ the maximum value, the command will be ignored and the n bytes following **ESC }** will be discarded from the buffer.

Legal DATA characters: 0 - 9

If the barcode data consists of an odd number of characters, the printer will add a “ 0” to the beginning of the barcode to make an even number of characters.

The **START/STOP** code will automatically be added to the beginning and end of the data. If printing of a human-readable representation is specified (bit 1 of c), the **START/STOP** codes will not be printed with the data, since it is not a printable character. If any illegal characters are encountered, the command will be ignored and the n bytes following **ESC }** will be discarded from the buffer.

How to calculate the check digit :

1. Assume that barcode data is $A_1 A_2 A_3 A_4 A_5 A_6 A_7$.
2. If necessary, put zero (0) before first data field (A_1) because the final data must be even field. In the above example, the zero (0) must be put before first data field.
Then modified data becomes $A_0 A_1 A_2 A_3 A_4 A_5 A_6 A_7$. ($A_0 = 0$)
3. Add up even fields data ($A_{EVSUM1} = A_1 + A_3 + A_5 + A_7$).
4. Multiply the A_{EVSUM1} by 3 ($A_{EVSUM3} = A_{EVSUM1} * 3$).
5. Add up odd fields data ($A_{ODSUM} = A_0 + A_2 + A_4 + A_6$).
6. Add up the A_{EVSUM3} to A_{ODSUM} ($A_{EOSUM} = A_{EVSUM3} + A_{ODSUM}$).
7. Find B_0 under following conditions.
The conditions are as follows :
 $B_1 = B_0 * 10$, $B_1 \geq A_{EOSUM}$, B_1 and B_0 must be integer, and the B_1 must be nearest the A_{EOSUM} .
8. The Check Digit (CD) is difference between B_1 and A_{EOSUM} ($CD = B_1 - A_{EOSUM}$).

For example, assume barcode data of 130573429. Since the number of data items is odd, the program adds a zero to the beginning, so that the barcode will be made from this data: 0130573429.

The sum of the even items is $1 + 0 + 7 + 4 + 9 = 21$. $21 \times 3 = 63$. The sum of the odd items is $0 + 3 + 5 + 3 + 2 = 13$. The sum of the results is $63 + 13 = 76$. The nearest multiple of 10 that is greater than 76 is 80. The check digit is $80 - 76 = 4$.

INTERLEAVED 2 OF 5

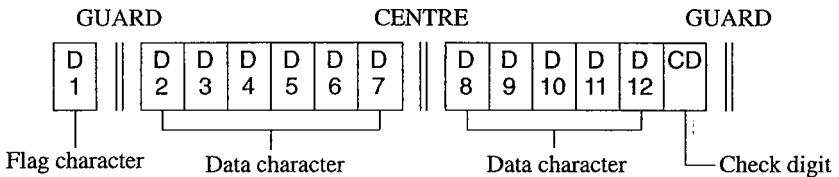
See industrial 2 of 5 for allowable numbers of characters, legal characters, and calculation of check digit.

EAN-13

The barcode data consists of 12 characters. Therefore the maximum possible value for n is 20. If n is greater than 20, the command will be ignored and the n bytes following ESC } will be discarded from the buffer.

Legal DATA characters : 0 - 9

If any illegal characters are encountered, the command will be ignored and the n bytes following ESC } will be discarded from the buffer. The construction of the data is as follows:



The flag character can be printed. But the flag character will not be printed if the barcode is printed from the left margin.

How to calculate the check digit :

1. Assume that barcode data is $A_1 A_2 A_3 A_4 A_5 A_6 A_7 A_8 A_9 A_{10} A_{11} A_{12}$.
2. Add up even fields data ($A_{EVSUM} = A_2 + A_4 + A_6 + A_8 + A_{10} + A_{12}$).
3. Multiply the A_{EVSUM} by 3 ($A_{EVSUM} = A_{EVSUM} * 3$).
4. Add up odd fields data ($A_{ODSUM} = A_1 + A_3 + A_5 + A_7 + A_9 + A_{11}$).
5. Add up the A_{EVSUM} to A_{ODSUM} ($A_{EOSUM} = A_{EVSUM} + A_{ODSUM}$).

The conditions are as follows :

$B_1 = B_0 * 10$, $B_1 \geq A_{EOSUM}$, B_1 and B_0 must be integer, and the B_1 must be nearest the A_{EOSUM} .

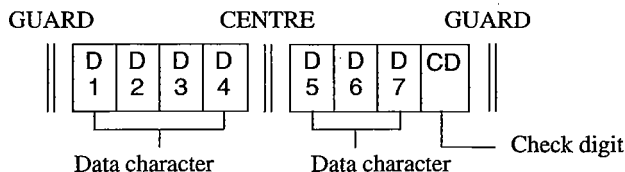
7. The Check Digit (CD) is different between B_1 and A_{EOSUM} ($CD = B_1 - A_{EOSUM}$).

EAN-8

The barcode data consists of 7 characters. Therefore the maximum possible value for n is 15. If n is greater than 15, the command doesn't operate normally.

Legal DATA characters : 0 - 9

If any illegal characters are encountered, the command will be ignored and the n bytes following ESC } will be discarded from the buffer. The construction of the data is as follows:



Reference Section 2

How to calculate the check digit :

1. Assume that barcode data is $A_1 A_2 A_3 A_4 A_5 A_6 A_7$.
2. Put zero (0) before first data field (A_1) because the final data must be even field.
Then modified data becomes $A_0 A_1 A_2 A_3 A_4 A_5 A_6 A_7$. ($A_0 = 0$)
3. Add up even fields data ($A_{EVSUM1} = A_1 + A_3 + A_5 + A_7$).
4. Multiply the A_{EVSUM1} by 3 ($A_{EVSUM3} = A_{EVSUM1} * 3$).
5. Add up odd fields data ($A_{ODSUM} = A_0 + A_2 + A_4 + A_6$).
6. Add up the A_{EVSUM3} to A_{ODSUM} ($A_{EOSUM} = A_{EVSUM3} + A_{ODSUM}$).
7. Find B_0 under the following conditions. The conditions are as follows :
 $B_1 = B_0 * 10$, $B_1 \geq A_{EOSUM}$, B_1 and B_0 must be integer, and the B_1 must be nearest the A_{EOSUM} .
8. The Check Digit (CD) is difference between B_1 and A_{EOSUM} ($CD = B_1 - A_{EOSUM}$).

CODE 128 B

Legal DATA characters : ASCII characters 20_h to $7F_h$.

(Value 0 to 95 in the Code 128 Character Value table on page E-15)

Value 104 is added automatically as the **START** character, and the **STOP** code is added automatically as the **STOP** character.

The check character is added automatically, regardless of the value of c .

The step of calculations are as follows:

1. Obtain the value for each data character except for the **STOP** code by referring to the table on page E-15.
2. Multiply the **START** code by 1.
3. Multiply the first character by 1.
4. Multiply the second character by 2, the third character by 3, the fourth character by 4, and so forth.
5. Sum up all the values obtained at steps 2) to 4) above.
6. Divide the result of step 5) by 103 and obtain the remainder.
7. Obtain the character corresponding to the remainder which is the check digit to be applied.

CODE 128 C

Legal DATA characters : ASCII characters 30_h to 39_h .

(Value 0 to 99 in the Code 128 Character Values table on page E-15).

Value 105 is added automatically as the **START** character, and the **STOP** code is added automatically as the **STOP** character.

The check character is added automatically, regardless of the value of c , calculated in the same way as for **CODE 128 B**.

To adjust the columns, when the total number of characters is even, “ 0” is added before the first character.

Exampe: when “ 0123456 ” is sent from the host computer

START	00	12	34	56	Check character	STOP
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Code 128 Character Values

Character CODE B	Character CODE C	Value	Character CODE B	Character CODE C	Value	Character CODE B	Character CODE C	Value
SP	00	0	D	36	36	h	72	72
!	01	1	E	37	37	i	73	73
"	02	2	F	38	38	j	74	74
#	03	3	G	39	39	k	75	75
\$	04	4	H	40	40	l	76	76
%	05	5	I	41	41	m	77	77
&	06	6	J	42	42	n	78	78
'	07	7	K	43	43	o	79	79
(	08	8	L	44	44	p	80	80
)	09	9	M	45	45	q	81	81
*	10	10	N	46	46	r	82	82
+	11	11	O	47	47	s	83	83
,	12	12	P	48	48	t	84	84
-	13	13	Q	49	49	u	85	85
.	14	14	R	50	50	v	86	86
/	15	15	S	51	51	w	87	87
0	16	16	T	52	52	x	88	88
1	17	17	U	53	53	y	89	89
2	18	18	V	54	54	z	90	90
3	19	19	W	55	55	{	91	91
4	20	20	X	56	56	|	92	92
5	21	21	Y	57	57	}	93	93
6	22	22	Z	58	58	~	94	94
7	23	23	[	59	59	DEL	95	95
8	24	24	\	60	60		96	96
9	25	25	]	61	61		97	97
:	26	26		62	62		98	98
;	27	27		63	63		99	99
<	28	28	'	64	64			100
=	29	29	a	65	65			101
>	30	30	b	66	66			102
?	31	31	c	67	67			103
@	32	32	d	68	68	START		104
A	33	33	e	69	69		START	105
B	34	34	f	70	70	STOP	STOP	106
C	35	35	g	71	71			

Reference Section 3

Citizen Systems & Peripherals Europe Ltd. Limited Warranty PROdot 300 Printer

What is covered and for how long:

Citizen Systems & Peripherals Europe Ltd. ("Citizen") warrants that the product with which this warranty statement is enclosed is free from defects by reason of improper workmanship and/or material and will operate as intended by Citizen for a period of two years. This warranty period commences on the date of original purchase for purposes other than resale and applies only if such original purchase occurs in the Europe, Middle East, Eastern Europe and in other countries where Citizen Systems & Peripherals Europe Ltd. provides warranty service.

Despite the above two year warranty term, Citizen warrants consumable items, specifically ribbons, only for the usage described in the user manual which, depending upon product usage, may be significantly shorter than the two year warranty.

How to get service under this warranty:

To obtain service during the warranty period please present your Citizen product, properly packaged in its original container or an equivalent, to Citizen, Citizen's designated agent, or your Citizen Dealer as directed by Citizen. Any postage, insurance and shipping costs incurred in presenting or sending your Citizen product for service are your responsibility.

Your original purchase receipt or other satisfactory proof of the date of the original retail purchase of your Citizen product must be provided to obtain service under this warranty.

What Citizen will do to correct problems:

Citizen will, at its option, repair or replace on an exchange basis the defective product without charge for parts and labour. Citizen may use remanufactured, refurbished, or used parts and components in making warranty repairs.

Should Citizen determine that the product is not defective or is not covered by the warranty or is outside of the warranty term, the product shall be returned to you at your expense without being repaired or replaced.

Warranty limitations and other information:

This warranty applies only if your Citizen product fails to function properly under normal use and within Citizen's specifications described in the User Manual. This warranty does not apply if the Citizen label or logo, or the rating label or serial number, has been removed from your Citizen product, or if, in the sole opinion of Citizen, your Citizen product has been damaged by accident, misuse, neglect, including, but not limited to, improper packing, shipping, modification or servicing by other than Citizen or a Service Center authorized by Citizen to repair this product, or has not been properly maintained or operated as described in the User Manual.

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This Warranty is in addition to your statutory rights.

No Citizen dealer, agent or employee is authorized to make any modification, extension, change or amendment to this warranty.

Who to contact if you have a problem:

You may REQUEST INFORMATION on how to obtain service under this warranty by contacting the Dealer from whom your Citizen product was purchased, or by contacting Citizen Systems & Peripherals Europe Ltd. at the address printed below. DO NOT SEND PRODUCT(S) TO THIS ADDRESS.

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Part No. BB74916-00