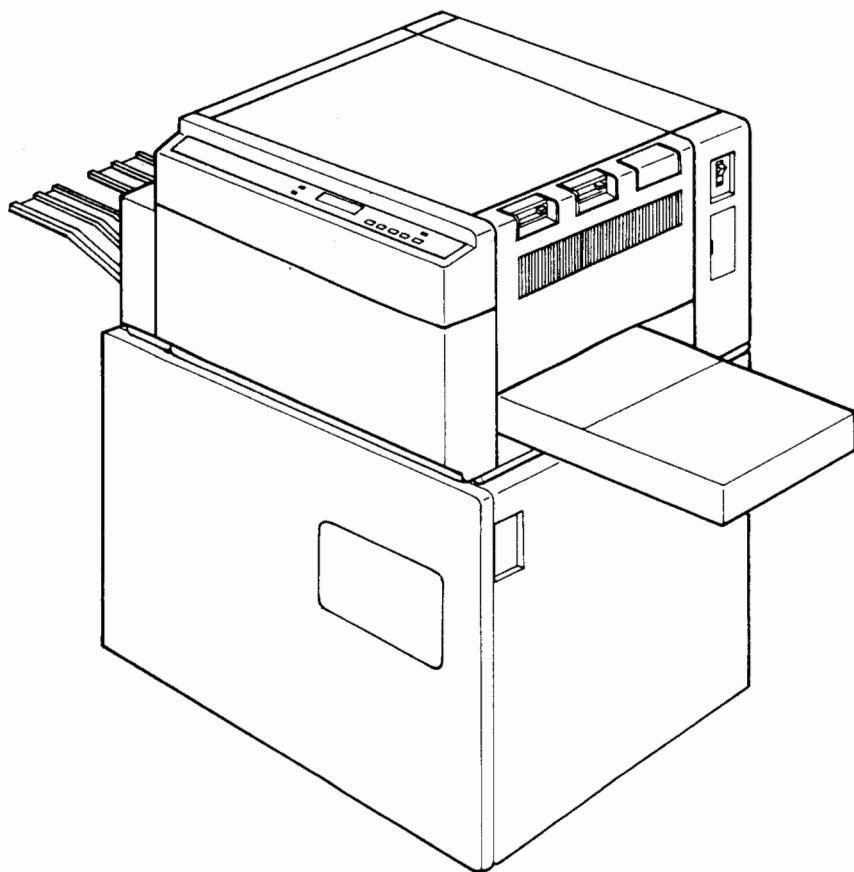


FUJITSU RX7300E LASER PRINTER OPERATOR'S MANUAL



RX7300E

48FH5014E-03

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WARNING: This printer is a Laser Class 1 device as defined in BS4803 and IEC 825 specifications.

Printing is carried out using a laser beam. The laser is entirely contained within an enclosed housing and cannot present any risk whatsoever to the user.

Any operation on the printer other than as defined in the supplied user manuals should not be attempted other than by an authorised Fujitsu representative.

Federal Communications Commission Radio Frequency Interference Statement for United States Users

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

NOTE: The length of power cord must be 3 m or less.

NOTE: An unshielded plug or cable may cause radiation interference. The printer is designed for use with a properly shielded interface cable. A non-shielded interface cable must not be used. The shield must be connected directly to the chassis of the printer. The cable length must be 3 m or less.

For German Users

Dieses Gerät entspricht als Einzelgerät den Funkentstörungsanforderungen der Postverfügung Nr. 1046/1984 bzw. der Grenzfläche B nach VDE 0871/6.78.
Das Kabel muß abgeschirmt und unter 3 Meter lang sein.

For Canadian Users

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radio-électriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Règlement sur le brouillage radio-électrique édicté par le ministère des Communications du Canada.

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FUJITSU LIMITED

48FH5014E-03 October 1989

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SECTION 1

INSTALLATION

PARTS CHECKLIST

Check that you have the following items and that they are all in good condition:

Printer
Developer unit
Photoconductor drum
Paper cassette with lid
Output paper tray
Face down stacker with tray
AC power cable
Blower brush

POSITIONING THE PRINTER

Before setting up your printer, take care to select a suitable position for the printer, taking note of the following precautions:

- * Avoid places which are exposed to direct sunlight
- * Avoid naked flames or high temperatures or humidity
- * Avoid places subjected to excessive vibration
- * Avoid dust, gas outlets and areas of high ozone concentration
- * Avoid any magnetised materials
- * Avoid using a power cable longer than 3 metres
- * Ensure the installation site is stable and level
- * Ensure adequate ventilation

- * Ensure the paper supply is stored in an area of low humidity
- * Ensure the ambient temperature in the area where the printer is to be operated does not fall below 10 degrees C or rise above 35 degrees C.

POWER SUPPLY REQUIREMENT

This printer is supplied with a 3-metre power cable. If this is extended to more than metres, including the extension cable, there may be some loss of power.

Avoid a power supply shared with equipment producing excessive electrical noise or power degradation through load variation.

CONNECTING THE DATA CABLE

Make sure that you are using the correct data cable.

Parallel Interface Cable - the connector is a 36-pin, shielded Centronics type; AMP DDK 57FE-30360 or equivalent. Push the data cable into the parallel interface port at the back of the printer and secure it with the two metal clips at the sides of the interface.

RS-232C Serial Interface Cable - the connector is a D type 25 pin, CANON DB25 or equivalent. Push the data cable into the serial interface port at the back of the printer and secure it with the two screws on the interface plug.

Power

Check the power status light on the front panel. When the amber light is ON the printer is receiving power.



SECTION 2

OPERATIONS

GENERAL DESCRIPTION

Figure 2.2 shows the main mechanical features of the laser printer.

THE CONTROL PANEL

The control panel has three lights (LEDs), five keys and a 16 character LCD display.

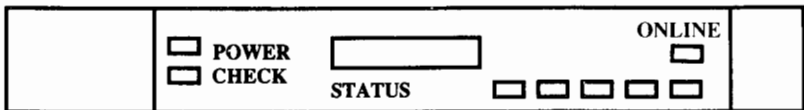


Figure 2.1 The control panel

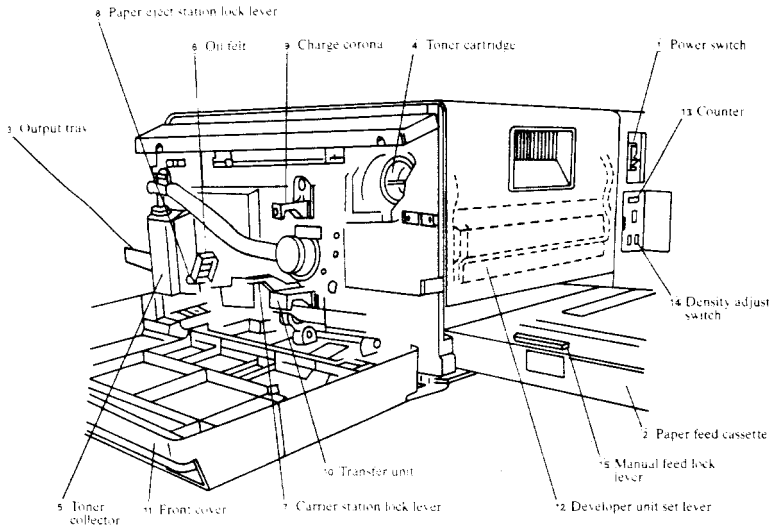


Figure 2.2 Inside the printer

1. Power switch
2. Paper feed cassette
3. Output tray (face down stacker not shown)
4. Toner cartridge
5. Toner collector
6. Oil felt
7. Carrier station lock lever
8. Paper eject station lock lever
9. Charge corona
10. Transfer unit
11. Front cover
12. Developer unit set lever
13. Counter
14. Density adjustment controls
15. Manual feed lock lever

USING THE CONTROL PANEL

GENERAL DESCRIPTION

The operator control panel is on the front of the printer. By using the keys on the control panel you can access all of the facilities of the printer, including the self test routine, fonts, type sizes, emulation and operation modes. The LCD screen and the status lights provide information about the current status of the printer. The panel consists of:

1. Power status light
2. On-line status light
3. 16 character LCD display
4. Control keys (five keys)
5. Check status light

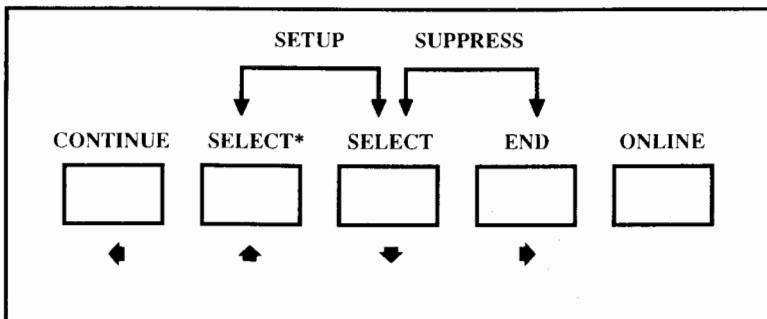


Figure 2.3 The control keys

THE POWER STATUS LIGHT

The amber power status light indicates that the printer is connected to the mains and that the printer is switched on. (The power on/off switch is on the right side of the machine.)

THE ONLINE STATUS LIGHT

The green on-line status light is used to indicate when the printer is on-line or off-line. When the printer is on-line, data may be received and printed out. To switch the printer off-line, press the ONLINE key beneath the on-line status light. A pause signal will be sent to the computer, preventing it from sending any data to the computer until the printer is returned to the on-line state.

THE LCD DISPLAY

The LCD display is used to show the current state of the printer. A variety of display modes and messages may be seen at any one time, these are explained in the relevant sections of this manual.

THE CONTROL KEYS

The control panel has five keys whose functions are as follows:

The ON-LINE Key

The ON-LINE key may be used to switch the printer on-line or off-line. When the printer is on-line, the On-line Status Light will be on. When the printer is off-line it will be unable to receive any further data until it is switched on-line.

The CONTINUE Key

This key is used to cause the printer to continue operation in any of the following situations:

Wrong paper size - following the report of a wrong paper size, you may continue using the same size paper by pressing the CONTINUE key. However, when a page has been formatted for a particular size of paper, using the wrong size paper may cause unpredictable results.

Manual feed - In response to a request for a manually fed sheet of paper, you may press the CONTINUE key to feed paper from the currently selected cassette.

Note: Do not press the CONTINUE key after a paper jam as the data for the current page will be lost.

The END Key

At the end of a document, your application software may not send the appropriate code to eject the last sheet of paper. Similarly, if printing is terminated abnormally then the last sheet may not be ejected. To eject the last page of the document, press the END key. If no printable data has been received since the last page was ejected, pressing the END key will have no effect.

The SELECT Key

This two key is used to start the process of changing the printer's operation parameters. The changes made are remembered by the printer for only one document, the printer then returns to the state it was in before those changes were made. To store a set of document setup for future use, see the section on the FREEZE item in the SETUP menu and the CUSTOM items in the SELECT menu.

See USING THE MENUS below for a full explanation of these two menus.

In addition to the single use of the five keys, there are two combinations of key presses which have other effects:

SELECT and END (SUPPRESS)

Pressing the SELECT and END keys down together for more than one second causes the remainder of an incoming document to be suppressed. The data will continue to be processed by the printer, but it will not be printed out.

This may be used at any time to abort the printing of a document, for example, if the document has been formatted incorrectly for the current paper size.

You may need to press the END key to eject a page of the document which has been partially processed by the printer and retained in the printer's memory.

▲ and SELECT (SETUP)

Pressing the ▲ and SELECT keys down together for more than one second causes the SETUP menu to be presented. This menu allows you to change communication parameters and other settings which only rarely need to be changed. See USING THE MENUS below for a full explanation of the setup menu.

THE CHECK STATUS LIGHT

When the red check status light is on, a check condition has occurred. This means that there has been an error which the printer cannot resolve and has therefore halted operation. When the check status light is on, the host computer will be unable to send further data to the printer and may appear to 'hang'. A message will be displayed on the printer's LCD display.

THE DISPLAY: THE FREE STATE

When the printer is first switched on, the LCD display will show the date and time in the format:

JAN 01 00:00:00

The time (on the right of the display) will be updated every second. Setting the time is explained in an appendix to this manual, but for the moment, you may leave it as it is.

When the date and time are displayed, the printer is in the FREE state. It is waiting for data from a host computer or changes in operating mode from the control panel.

THE DISPLAY: THE BUSY STATE

When data is being received and/or printed, the display will enter the BUSY state. The left of the display will show the document number and page number. For example, while the printer is working on page 10 of document 5, the left of the display will show:

5.10

The whole page image is created in the printer before printing begins and when one page is being printed, data for the next is being processed. To indicate that the next page is being processed, a plus sign is displayed after the document and page number. For example, when the display shows:

5.10+

the printer is processing page 11 of document 5.

The page number is updated as the printer begins printing that page. So when the printer is processing, for example, the first page of document 6 the screen shows:

6.0

When multiple copies of each page are being printed, the page number displayed stays the same for each.

Each time the printer starts to print a page, the right of the display shows the current paper size in use. For example, the display:

6.4 A4

indicates that the current paper size is A4. Also, if the paper hopper or second cassette feed is selected, or automatic feed switching, the current feed is also displayed. For example:

6.5 C2 A4

shows that the secondary cassette is in use and contains A4 paper.

THE DISPLAY: THE WAIT STATE

During the processing of a document, if the printer is held up for more than a second by the absence of data from the host computer, it enters the WAIT state.

While in the WAIT state, the display shows the document and page number at the left as described above. The right of the display shows the time. For example, the display:

7.5+ 00:00:00

indicates that the printer is waiting for data of page 6 of document 7.

MAKING A TEST PRINT

When you first switch the printer on, the check light will be lit for a short time while the print mechanism is initialised. When the check status light goes off, you may test the printer and determine the current print settings by making a test print.

Press the SELECT key four times, pausing briefly between presses. The LCD will show 'SETUPS' and the current paper size and a test print will be produced. The test print shows the current date, time and printer setup condition, number of sheets printed, paper sizes and hopper and stacker options.

Now press the SELECT key a further three times, followed by one press of the END key and another of the SELECT key. The printer will now issue a sheet giving the names and examples of all currently available fonts.

Note: You can also make a print-engine test print by pressing the TEST PRINT button which lies behind the small door on the right of the printer. This produces a pattern of horizontal lines at top and bottom in printable area.

USING THE MENUS

To set up the printer to your exact requirements, a system of menus and sub-menus is used. Menu items are displayed on the LCD display and the leftmost four keys are used to move from menu to menu and make selections. In addition to the key names used above, these keys are also marked with arrows. To move to the left or right in a menu, press the ◀ or ▶ keys. To select the menu item currently displayed, press the ▼ key. To move up a level from any position in a menu to the previous menu, press the ▲ key.

The left of the screen always shows the name of the current menu or sub-menu which you are viewing. If you are not sure where you are, look at the name of the menu and refer to the menu diagrams on the following pages.

When you have reached the lowest menu level and selected the option you require, press **↵** to register the selection. An equals sign (=) will appear by the selection to show that this is the currently selected setting in that menu.

A vertical bar in front of a menu item simply shows that that is the first item in that menu.

There are two top-level menus, the SETUP menu (figure 2.4) and the SELECT menu (figure 2.5):

THE SETUP MENU

The SETUP menu is used to set the operating parameters of the printer to your exact requirements. It is most likely that you will set up the printer for use with a particular computer and not need to change the parameters of SETUP until the printer is used as part of another system.

Press the **SELECT*** and the **SELECT** keys together and hold them down for at least one second. The LCD display will now show:

```
*SETUP*|crlf
```

This indicates that you have entered the **SETUP** menu, and the first item in that menu is **crlf**. Press the **◀** or **▶** keys to move through the other menu items. Here is the full list of items in the **SETUP** menu and their uses:

crlf	characters accepted as end of line delimiter
coding	character set language
tilde	alternative escape sequence
serial	serial communication parameters
parallel	parallel communication parameters
pageram	memory size for page imaging
buffer	size of communication buffer
action	diagnostics and system management

If you change the emulation mode in the **SELECT** menu (see below) to **LJET**, an additional item will be added to the **SETUP** menu:

LJarea	choice of logical printable area
---------------	----------------------------------

If you change the emulation mode in the **SELECT** menu (see below) to **FX80** or **PROPRIN**, an additional item will be added to the **SETUP** menu:

image	choice of interpretation of graphic images
--------------	--

If you change the emulation mode in the **SELECT** menu (see below) to **LAYOUT**, an additional item will be added to **SETUP** menu:

escape	defines alternative escape character
---------------	--------------------------------------

SETUP: crlf

The available settings of this option are **CRLF**, **CR**, **LF**, **CRorLF**.
 The factory setting is **CRLF**.

Your host computer or application software may send at the end of each line a carriage return character (CR), a line feed character (LF) or both. This option allows you to set the appropriate mode on the printer to comply with your computer and/or software.

Press the ◀ or ▶ keys until the required option is displayed and press the ↵ key. An equals sign (=) will appear in front of that option to show that this is the currently selected setting.

If you send a single spaced document to the printer and it appears double spaced, set this option to CRLF. If you send a document and it appears with all of the lines printed on top of one another, set the crlf option to CR.

SETUP: coding

When you select the coding option from the SETUP menu, a further menu is presented. This menu consists of the different language character sets which are resident. The options are none, FRANCE, GERMANY, UK, DENMARK1, SWEDEN, ITALY, SPAIN, JAPAN, NORWAY and DENMARK2.

The factory setting for the coding parameter is none.

SETUP: tilde

The tilde option in the SETUP menu allows you to use the character sequences TILDE CIRCUMFLEX (~ ^) and TILDE TILDE CIRCUMFLEX (~ ~ ^) instead of the escape sequences ESC BEL and ESC ESC BEL which have special meanings.

The two options within the tilde are DISABLED and ENABLED.

The factory setting is DISABLED.

If you are unable to use the escape sequences with your host computer or application, set this option to ENABLED.

SETUP: serial

If your printer is connected to the host computer via a serial interface, select the serial option from the SETUP menu to set up the communication parameters.

The serial option leads to a further sub-menu containing the communications parameters for the serial interface. Select each item in the serial menu in turn and select the setting appropriate for your host computer's serial port.

SETUP: serial: baud

This option is used to set the speed of data transfer from computer to printer (baud rate). The options are 19200, 9600, 4800, 2400, 1200, 600 and 300. Use the fastest setting allowed by your host computer.

SETUP: serial: format

The format option leads to a further sub-menu containing the list of data transfer formats allowed by the printer. The options consist of two parts, the number of data bits (7 or 8) and the parity setting (NONE, EVEN, ODD, ZERO or MARK). The options are 8+NONE, 7+NONE, 8+EVEN, 7+EVEN, 8+ODD, 7+ODD, 8+ZERO, 7+ZERO, 8+MARK and 7+MARK.

SETUP: serial: stop

This option allows you to set the number of stop bits sent with each character. The options are 1 or 2.

SETUP: serial: flow

The flow option allows you to set the type of handshaking used to pause and continue data transfer between the host computer and printer.

The options available are XON/XOFF, ETX/ACK, XON+ETX and NO FLOW.

SETUP: serial: dtr

The dtr option allows you to set the type of DTR (data terminal ready) signal used by the printer, high or low. The options are:

HI/LO	dtr high for ready and low for not ready
LO/HI	dtr low for ready and high for not ready
HI/HI	dtr permanently high
LO/LO	dtr permanently low.

The factory settings for the serial parameters are:

baud	9600
format	8+NONE
stop	1
flow	XON/XOFF
dtr	HI/LO

SETUP: parallel

If the printer is connected to the host computer via a parallel interface, select the parallel option from the SETUP menu to set the timing of the handshaking signal used to pause and continue data transfer.

Select parallel and another menu containing just two items is displayed. The items are timing and bits.

The first sets the timing of the parallel interface handshaking signal. If you are not sure which setting to use, try each one in turn in the following order until you can successfully print out a document of several pages. The options allowed are EARLY, LATE, EARLY+ and LATE+.

The second item under parallel, bits, sets the number of data bits passed by the parallel interface, 7 or 8.

The factory setting for the parallel parameters are EARLY+ and 8.

SETUP: pageram

The pageram option allows you to control the amount of printer memory to be allocated for page imaging, and consequently the amount of memory which will be left as user area for downloading. The options within the pageram are as follows:

- | | |
|-------|--|
| A4 | The printer allocates a single page memory area for A4. You can use up to and including A4 and/ or Letter size paper only. |
| LEGAL | The printer allocates a single page memory area for Legal. You can use up to and including Legal size paper. |
| B4 | The printer allocates a single page memory area for B4. You can use any paper size supported by this printer. |
| 2A4 | The printer allocates two page memory areas for A4. You can use any paper size supported by this printer. |

You can get the size of the allocated page memory area(s) and free area for user by printing the setup report (refer to the SELECT: action for operation).

The factory setting of the pageram parameter is 2A4.

SETUP: buffer

The buffer option allows you to select the size of the communication buffer to be used to store data from your host. The size can be specified with the value representing a number of kilobytes (from 1 to 255 kilobytes). When the buffer is selected, the LCD screen shows;

```
buffer = 16
```

To increase the buffer size, press the \blacktriangleright key; to decrease the buffer size, press the \blacktriangleleft key. When the required buffer size is displayed, press the \blacktriangledown key to confirm the selection. To take effect, a change to the buffer size must be saved (by FREEZE1), and then the printer reset by selecting the reset: *SYSTEM* option in the SELECT: action, or by the power off and on again.

The factory setting of the buffer parameter is 16.

When you select the larger buffer, though the user area for downloading is reduced, it provides the greater potential for freeing your host for other activities.

When you select the smaller buffer, it increases the user area and reduces the possibility for your host to detect device time-out with the printer.

SETUP: action

The action option in the SETUP menu leads to a further sub-menu containing, initially, six items; SELFTEST, FREEZE1, FREEZE2, FREEZE3, FREEZE4 and ENABLE.

SETUP: action: SELFTEST

Select the first item, SELFTEST, to instruct the printer to carry out a number of internal diagnostic tests.

SETUP: action: FREEZE1 to FREEZE4

The FREEZE options allow you to record in memory the full range of settings in the SETUP and SELECT menus. Those settings may then be called into operation every time you need to use that particular setup. You should set the printer options to the most useful settings and then select FREEZE1 from the SETUP menu. These settings are then stored in memory and can be recalled at any time.

The next most likely setting can then be saved in the same way to another area of memory by selecting FREEZE2 and so on to FREEZE4.

To recall the setups you have saved with FREEZE1 to FREEZE4, see the section on the CUSTOM1 to CUSTOM4 options in the SELECT menu.

SETUP: action: *ENABLE*

Selecting the *ENABLE* option allow you to carry out a number of privileged operations on the settings of the printer. After you have selected the *ENABLE* option, another item will be added to the SETUP: action menu; NVerase (see below).

SETUP: action: NVerase

This option will only appear in the SETUP: action menu after selection of the *ENABLE* option above. Menu settings are not affected by the use of this option.

SETUP: image

The LJarea option is only included in the SETUP menu if the mode option in SELECT menu (see SELECT: mode later in this section) is set to FX80 or PROPRIN. This option defines the way in which graphic images are presented in both mode, and allows you to select the function of MSB control commands. There are four options; UNIFORM, EXPAND, UNIFORM/ and EXPAND/.

The UNIFORM option causes bit-map graphic images to be printed exactly as they are received from the host computer.

The EXPAND option causes the horizontal distance between the dots of the graphic image to be periodically readjusted to allow for the difference between the resolution of the laser printer and the emulated, dot-matrix printer.

The UNIFORM/ option causes bit-map graphic images to be printed exactly as they are received from the host computer, and, in FX80 mode, MSB control commands to be same effect with Alternate Character Set Selection commands. For details, refer to the Programmer's Manual.

The EXPAND/ option causes the horizontal distance between the dots of the graphic image to be periodically readjusted to allow for the difference between the resolution of the laser printer and the emulated, dot-matrix printer, and, in FX80 mode, MSB control commands to be same effect with Alternate Character Set Selection commands. For details, refer to the Programmer's Manual.

The Factory setting of the image parameter is EXPAND.

SETUP: escape

The escape option is only included in the SETUP menu if the mode option in the SELECT menu (see SELECT: mode later in this section) is set to LAYOUT. This option allows selection of an alternative escape character for use as part of a LAYOUT command.

When escape is selected from the SETUP menu, a further sub-menu is presented containing the five items shown below:

escape none

This setting disables recognition of any alternative escape character.

escape \$(36)

This setting accepts the dollar sign (\$) as an alternative to the usual escape character. The dollar sign has the decimal ASCII value 36 (24 hexadecimal).

escape @(64)

This setting accepts the @ character as an alternative to the usual escape character. The @ character has the decimal ASCII value 64 (40 hexadecimal).

escape `(96)

This setting accepts the grave sign (`) as an alternative to the usual escape character. The grave sign has the decimal ASCII value 96 (60 hexadecimal).

escape ~(126)

This setting accepts the tilde (~) as an alternative to the usual escape character. The tilde has the decimal ASCII value 126 (7E hexadecimal).

The factory setting of the escape parameter is \$(36).

SETUP: LJarea

The LJarea option is only included in the SETUP menu if the mode option in SELECT menu (see SELECT: mode later in this section) is set to LJET. This option allows selection of printable area setting modes. There are three options; MODE1, MODE2 and MENU.

Selecting the MODE1 option allows you to set the printable area compatible with previous version of the printer.

Selecting the MODE2 option allows you to set the printable area fully compatible with HP LaserJet printers. In this mode, parameters set in the SELECT: margins menu are no effect.

Selecting the MENU option allows you to set the printable area following to the margins of the SELECT: margins option (see SELECT: margins later in this section).

The Factory setting of the LJarea parameter is MODE2.

THE SELECT MENU

The SELECT menu is used to set a number of facilities and operating modes on the printer, such as number of copies of each document, emulation mode, font, margin sizes and so on.

There are two ways of using the SETUP menu; you may either make changes to the operating mode of the printer which will last for just one document, or you may change to a new operating mode which will be stored in memory as one of four resident setups (see the FREEZE options under action in the SETUP menu described earlier). Next time you switch the printer on, the settings will be taken from the internal settings as decided by the FREEZE1 option in the SETUP: action menu (see above).

To make changes which will remain in effect until the printer is switched off and will be stored for later use, enter the SELECT menu by pressing the SELECT key, make the required changes and press the ONLINE key. Now enter the SETUP menu (described earlier in this chapter) and select FREEZE1, 2, 3 or 4. The changes will then be stored as one of four resident setups. See action: reset: CUSTOM1 to 4 later in this section for restoring previously saved setups.

action	copies	find	make	load	symbol	magnify	orient	top	style	repeat
									none	none
								add	1	255
							NORTH	WEST	SOUTH	EAST
						left	top		0	1
								0	1	255
						0	1	1	255	
					HL	TRU	TRU	ON		
					COHERIC	PENULTI	MUSKARD	MUSKARD	MUSKARD	HELVAH
					LAYOUT	TABLES	TABLES	TABLES	TABLES	TABLES
					MANUAL	SECOND	MANUAL	MANUAL	MANUAL	MANUAL
		?		255						
print	print									
SETUP	CUSTOM	CUSTOM	CUSTOM	CUSTOM	CUSTOM	CUSTOM	CUSTOM	CUSTOM	CUSTOM	CUSTOM
	UNIT	MANAGES	TABLES							

Dotted boxes indicate menu items which are only present when optional hopper (Second Hopper, Large Capacity Hopper) is installed.

Figure 2.5 The SELECT Menu

The items in the SELECT menu are as follows:

action	test print and housekeeping functions
copies	number of copies of each document
feed	paper feed selector
mode	printer emulation mode
font	font selector
symset	font symbol set selector
margins	margin widths
orient	page orientation
lpi	lines per inch
style	macro style selector
report	error report mode selector

SELECT: action

When action is selected from the SELECT menu, a further sub-menu is presented containing the items print and reset. Print allows you to print a test sheet showing the current print settings or the current fonts available.

Reset allows you to reset the state of the printer to its default condition, or to restore a previously saved setup for a particular type of document.

The item setup leads to a further menu containing the items CUSTOM1, CUSTOM2, CUSTOM3, CUSTOM4, COUNTS and *SYSTEM*.

The items CUSTOM1 to 4 are the names of previously saved setups which may be saved with the FREEZE1 to 4 options under action in the SETUP menu (see SETUP menu earlier in this section).

SELECT: copies

The copies option in the SELECT menu allows you to set the number of copies printed of each page (maximum 255). When copies is selected, the LCD screen shows:

`copies=1`

To increase the number of copies, press the **▲** key; to decrease the number of copies, press the **▼** key. When the required number of copies is displayed, press the **◆** key to confirm the selection.

The factory setting of the copies parameter is 1.

SELECT: feed

The feed option allows you to select the paper feed source. The options within the feed are as follows;

MAIN	main paper cassette
MANUAL	manual feed from the manual guide on top of main cassette

If the optional second hopper or large capacity hopper is fitted underneath the printer, the following options is also offered;

SECOND	optional hopper
MAIN/ SECOND	alternate feed from main cassette and optional hopper, starting with main cassette When one paper source is empty, the printer switches automatically to feed from the other.
SECOND/ MAIN	alternate feed from optional hopper and main cassette, starting with optional hopper When one paper source is empty, the printer switches automatically to feed from the other.

The factory setting of the feed parameter is MAIN.

SELECT: mode

The printer offers a number of modes which allow it to emulate other commercially available printers, operate in LAYOUT Document Description Language (DDL) mode or in HEX mode, where a hexadecimal and ASCII printout is produced of the incoming data stream.

The modes offered are as follows:

LP - emulates the Fujitsu M304X Line Printer

HEX - produces a hexadecimal and ASCII file dump of the incoming data stream. For example, a file containing part of the nursery rhyme "Mary had a little lamb" would be printed as follows:

```

000000 1B 45 1B 28 73 50 1B 29 73 31 50 1B 26 6C 4C 1B  ··E·(sP·)s1P·&LL·
000010 26 6C 4F 1B 26 6C 45 1B 26 61 30 39 36 30 56 1B  ·&lO·&LE·&a0960V·
000020 28 73 31 30 48 1B 26 61 30 36 34 38 48 1B 26 68  ·(s10H·&a0648H·&k
000030 31 32 48 4D 61 72 79 1B 26 61 31 30 30 38 48 68  ·12HMary·&a1008Hh
000040 61 64 1B 26 61 31 32 39 36 48 61 1B 26 61 31 34  ·ad·&a1296Ha·&a14
000050 34 30 48 6C 69 74 74 6C 65 1B 26 61 31 39 34 34  ·40Hlittle·&a1944
000060 48 6C 61 6D 62 0D 1B 26 61 31 30 38 30 56 1B 26  ·Hlamb·&a1080V·&
000070 61 30 36 34 38 48 57 68 6F 73 65 1B 26 61 31 30  ·a0648Hwhose·&a10
000080 38 30 48 66 6C 65 65 63 65 1B 26 61 31 35 38 34  ·80HfLeece·&a1584
000090 48 77 61 73 1B 26 61 31 38 37 32 48 77 68 69 74  ·Hwas·&a1872Hwhit
0000A0 65 1B 26 61 32 33 30 34 48 61 73 1B 26 61 32 35  ·e·&a2304Has·&a25
0000B0 32 30 48 73 6E 6F 77 0D 1B 26 61 31 32 30 30 56  ·20Hsnow·&a1200V
0000C0 1B 26 61 30 36 34 38 48 41 6E 64 1B 26 61 30 39  ·&a0648HAnd·&a09
0000D0 33 36 48 65 76 65 72 79 77 68 65 72 65 1B 26 61  ·36Heverywhere·&a
0000E0 31 37 32 38 48 74 68 61 74 1B 26 61 32 30 38 38  ·1728Hthat·&a2088
0000F0 48 40 61 72 79 1B 26 61 32 34 34 38 48 77 65 6E  ·HMary·&a2448Hwen
000100 74 0D 1B 26 61 31 33 32 30 56 1B 26 61 30 36 34  ·t·&a1320V·&a064
000110 38 48 54 68 65 1B 26 61 30 39 33 36 48 6C 61 6D  ·8HThe·&a0936Hlam
000120 62 1B 26 61 31 32 39 36 48 77 61 73 1B 26 61 31  ·b·&a1296Hwas·&a1
000130 35 38 34 48 73 75 72 65 1B 26 61 31 39 34 34 48  ·584Hsure·&a1944H
000140 74 6F 1B 26 61 32 31 36 30 48 67 6F 0D 1B 26 61  ·to·&a2160Hgo·&a
000150 37 39 32 30 56 1B 26 61 31 39 34 34 48 31 0D 0D  ·7920V·&a1944H1··
000160 0C 1B 45  ···E

```

Figure 2.6 Hexadecimal Printout

LJET - emulates the Hewlett Packard LaserJet+ laser printer. All LaserJet+ modes and commands are available, with the addition of a number of other facilities not available on that printer. For a full list of the LaserJet+ commands and control codes, refer to the Programmer's Manual.

LAYOUT - offers the use of the LAYOUT document description language (DDL). LAYOUT offers a wide range of printer control, text formatting, page formatting and graphics facilities. A more complete description is provided in the Programmer's Manual.

DIABLO - emulates the Diablo 630 printer. All Diablo 630 modes and commands are available, with the addition of a number of other facilities not available on that printer. For a full list of the Diablo 630 commands and control codes, refer to the Programmer's Manual.

QUME - emulates the Qume Sprint 11 printer. All Qume Sprint 11 modes and commands are available, with the addition of a number of other facilities not available on that printer. For a full list of the Qume Sprint 11 commands and control codes, refer to the Programmer's Manual.

FX80 - emulates the Epson FX-80 dot matrix printer. All FX-80 modes and commands are available, with the addition of a number of other facilities not available on that printer. For a full list of the Epson FX-80 commands and control codes, refer to the Programmer's Manual.

PROPRIN - emulates the IBM Proprinter. All Proprinter modes and commands are available, with the addition of a number of other facilities not available on that printer. For a full list of the IBM Proprinter commands and control codes, refer to the Programmer's Manual.

The factory setting of the mode parameter is LJET.

SELECT: font

The default font may be selected from the seven fonts available by selecting the font option in the SELECT menu. The resident fonts are as follows:

Courier 12 point
Prestige Elite 10 point

TMS RMN 8 point
TMS RMN 10 point
TMS RMN 12 point
HELV 14 point bold
Line Printer 8.5 point

Kinds of font will be increased by inserting optional IC Card (Font).

The factory setting for the font parameter is **COURIER12**.

SELECT: symset

The symset option in the SELECT menu causes the available symbol sets for the currently selected font to be displayed.

SELECT: margins

The margins option in the SELECT menu leads to a further sub-menu of the four page margins; left, top, right and bottom. Each of these may be set to any distance in 0.01 inch steps. For example, select margins from the SELECT menu by pressing the \blacktriangledown key. Now press \blacktriangledown again to select left. The LCD screen will show:

```
left=25
```

showing that the left margin is currently set to 0.25 inches. To increase the margin size, press the \blacklozenge key once and the number will be incremented by one to 26 and the screen will show:

```
left 26
```

indicating a margin size of 0.26 inches. To confirm this setting, press the \blacktriangledown key. The screen will now show:

```
left= 26
```

the equals sign shows that this is the currently selected setting. Each of the four margins may be set in the same way.

The factory setting for the margins are **TOP** and **BOTTOM**, 0.5 inches, **LEFT** and **RIGHT**, 0.25 inches.

SELECT: orient

The orient option in the SELECT menu allows you to choose the print orientation on the paper; **EAST**, **NORTH**, **WEST** or **SOUTH**. The default orientation is **NORTH**. The four orientations are shown in figure 2.7.

The factory setting for the orient parameter is **NORTH**.

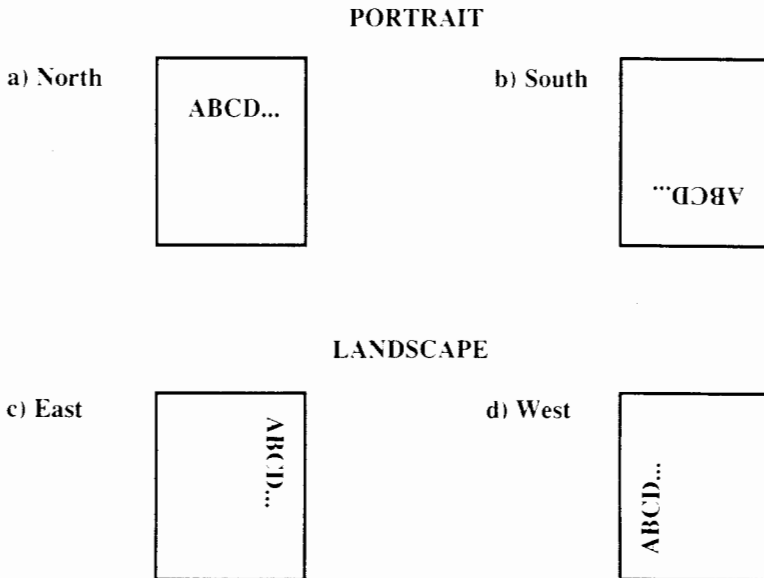


Figure 2.7 Print Orientation

SELECT: lpi

The lpi option in the SELECT menu allows you to specify the number of printed lines per inch (lpi). Select lpi from the SELECT menu by pressing the **▼** key. The screen will show:

```
lpi=6
```

To increase the number of lines per inch, press the **◆** key and the number will be incremented with each key press. To decrease the number of lines per inch, press the **◆** key and the number will be decremented with each key press. When the required number is displayed, press the **▼** key to confirm your selection.

A value of auto is used to indicate that the default value for the current mode (see SELECT: mode above) is to be used, or that the number of lines per inch is to be determined by the currently selected font.

SELECT: style

This menu item allows you to select from the currently loaded Document Style Macros.

Whenever a new document starts, the currently selected style macro (if any) is executed in preparation for the document data.

SELECT: report

The report option in the SELECT menu allows you to have a report of any protocol (mode) errors printed at the end of each document. The two options within report are none and ERRORS. Select ERRORS to see a printout of all errors received or none to suppress the error report.

IC CARDS

IC cards provide downloadable fonts to extend the fonts already resident in the printer. The cards are very simple to use and need only to be slotted in place in one of the three card slots on the right of the printer.

Figure 2.8 shows an IC card being pushed into place. Push the card in until it clicks home.

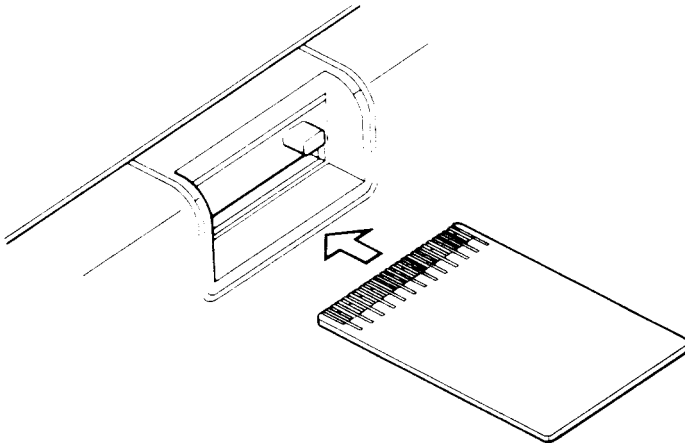


Figure 2.8 Inserting an IC card

Figure 2.9 shows an IC card correctly inserted. To remove the card, push the button above the slot and the card will be ejected.

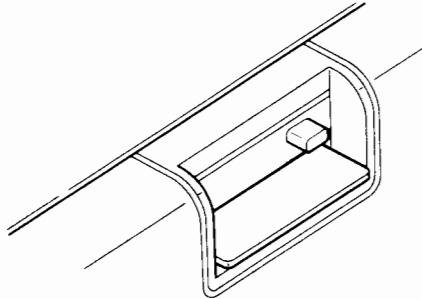


Figure 2.9 IC card correctly inserted

SECTION 3

PRINTER CONSUMABLES

FILLING AND FITTING THE PAPER CASSETTE

Make sure that the paper is clean and crumple-free.

Take a sheaf of paper - about 250 sheets, or half a packet - and bend it forwards and backwards (figure 3.1) to ensure sheets do not stick together.

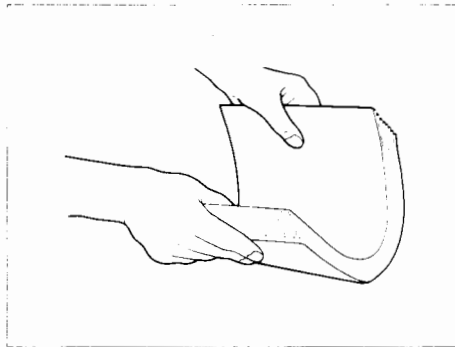


Figure 3.1 Preparing the paper

Slide the paper under the corner holders of the cassette and rock the cassette backwards and forwards to settle the paper.

Replace the cassette cover and fit the cassette into the right side of the printer (figure 3.2).

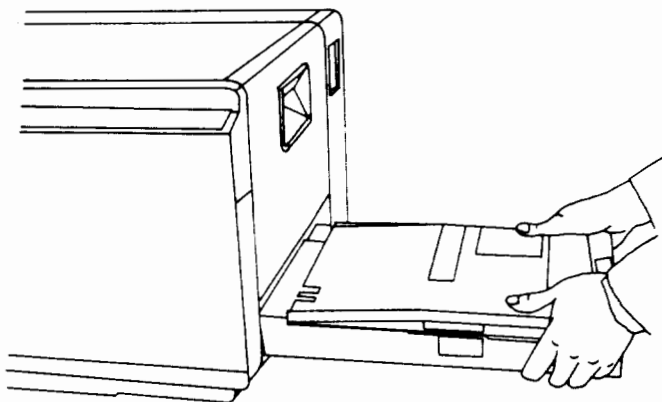


Figure 3.2 Replace paper cassette

Make sure the sheet guide in the cassette cover is pulled fully back (figure 3.3).

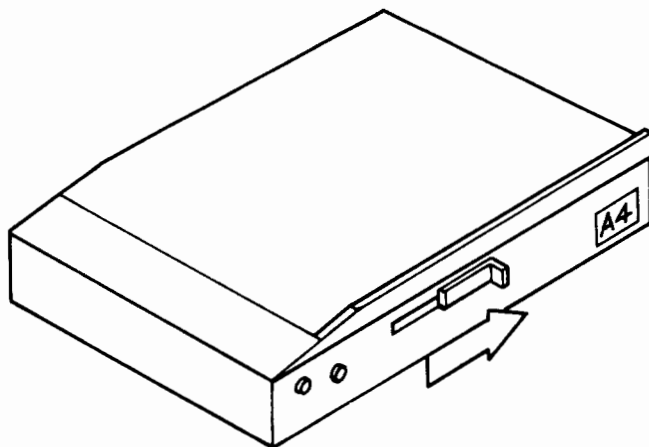


Figure 3.3 Manual feed slide back

CHANGING THE TONER CARTRIDGE

One toner cartridge will produce around 6000 printed pages of A4 size paper at 4% of black dot ratio. When the print becomes too light you may change the print density with the density controls behind the door on the right of the printer.

Only when the display shows the message 'Toner Empty', replace the toner cartridge with a new one by following the instructions below.

Note: The toner powder can be difficult to remove from clothes and soft furnishings. There may be some toner powder left in the old cartridge so follow the instructions carefully and dispose of the old toner cartridge safely.

1. Open the front cover of the printer (The display will show the message 'Cover Open.') and turn the toner cartridge anticlockwise by 180 degrees.
2. Gently pull the cartridge out. There may be some toner left inside the cartridge so pull the cartridge out very carefully, keep it level and place it somewhere safe immediately.
3. Shake the new toner cartridge from side to side so the toner is laid evenly along the length of the cartridge (figure 3.4).

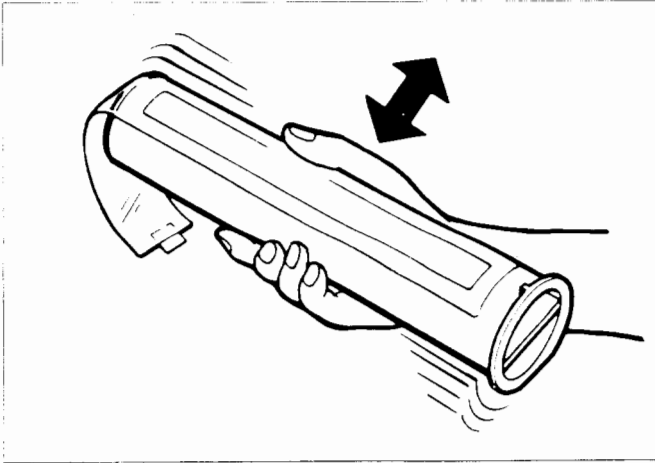


Figure 3.4 Shaking the toner cartridge

4. Loosen the end of the sealing tape on the cartridge and insert the end of the cartridge into the opening in the printer.
5. Gently push the cartridge into the printer and keep pulling the seal away from the cartridge as it goes in. As the seal comes away from the cartridge altogether the cartridge should be almost all the way into the printer (figure 3.5).

Insert the new toner cartridge while removing seal. Do not turn it until insertion is complete. When it is fully inserted, turn the cartridge 180° clockwise:

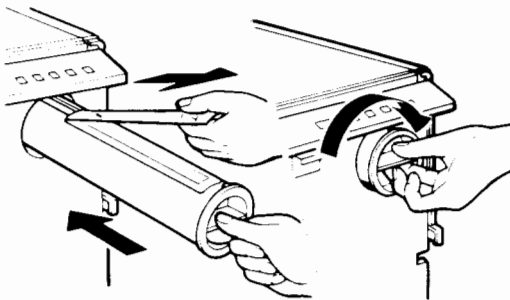


Figure 3.5 Fitting the toner cartridge

6. Push the cartridge all the way into the printer until it stops.
7. Turn the cartridge clockwise by 180 degrees, so that the handle is level again.
8. Tap the top of pipe leading to the used toner collector to free any trapped toner.
9. Remove the toner collector (The display will show the message *Collector Out.) and seal it with the cap provided with the new toner cartridge. Put the used toner in the bag provided with the new toner cartridge and dispose of the used toner carefully.
10. Fit the new toner collector to the printer (The display will show the message *Cover Open again).
11. Remove the old oil felt and dispose of it safely. Fit the new oil felt to the printer.
12. Close the front cover of the printer (The display will change to other message, and the initial operation of mechanism will start).

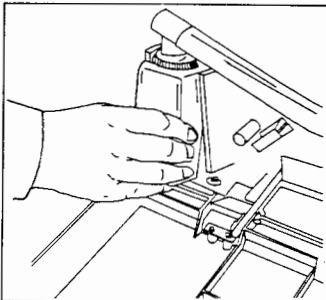


Figure 3.6 Replacing the toner collector

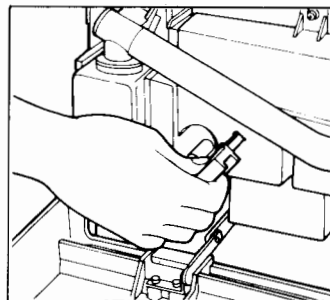


Figure 3.7 Replacing the oil felt

SECTION 4

TROUBLESHOOTING

GENERAL

This chapter discusses two problems which may occur while the printer is in use and the solutions to those problems.

PAPER JAMS

Reason	Solution
The paper is folded, creased or torn	Remove the damaged paper
The paper cassette is not correctly fitted	Remove the cassette and carefully refit it
The paper cassette has been over filled	Remove some of the paper
The paper is not set under the corner holders	Remove the cassette and refit the paper under the corner holders
The paper cassette is set for manual feed	Pull the manual feed slide all the way back

Clearing Paper Jams Inside the Printer

The figure below shows how paper is carried through the printer:

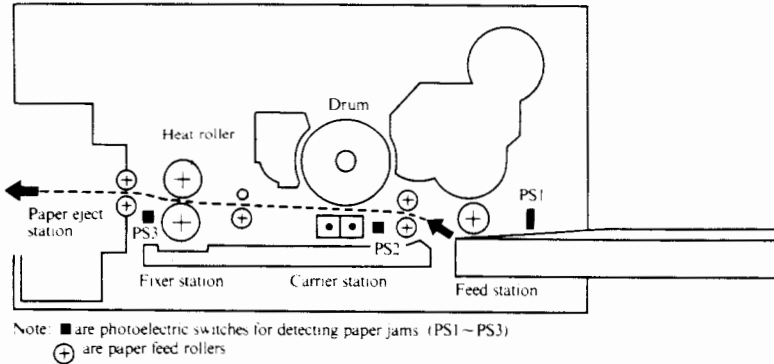


Figure 4.1 Paper sensors and paper path

Note: If jammed paper is left in the printer for a long time, the heat generated by the printer may discolour the paper and cause paper debris to enter the print mechanism. For this reason you should clear any jammed paper immediately it occurs.

The heat roller (see figure 4.1) may still be hot while you are removing jammed paper. **DO NOT TOUCH THE HEAT ROLLER.**

1. If paper jams in the paper eject station, open the front cover, lower the carrier station using the lock lever. Remove the paper while pushing the paper eject station lever upwards.
2. If paper jams in the carrier station or fixer station, open the front of the printer, lower the carrier station and remove the paper.

3. If paper jams in the paper feed station, pull out the paper cassette. Open the front cover, lower the carrier station and carefully remove the paper, taking care not to tear it. Reset the carrier station and refit the paper cassette. Close the front cover.

POOR PRINT QUALITY

Symptom	Solution
Print quality is streaky	The paper has been stored in an area of high humidity. Replace the paper
Print is too light or the page is smudged	The charge corona wire may need cleaning
Print density is too low or too high	Adjust the density controls behind the panel on the right side of the printer

SECTION 5

MAINTENANCE

CLEANING

Before performing the following cleaning operations, switch the printer off and disconnect it from the mains power supply.

When the charge corona wire or transfer unit wire need to be cleaned (see the troubleshooting guide above), follow this procedure: Remove the unit fully from the printer and use the supplied blower-brush to clean all traces of toner powder from inside the unit.

Note: Take care not to break the transfer or charge wires inside the unit.

Replace the unit, taking care to slide it all the way in and push until it clicks home.

Close the printer cover.

If the inside of the printer covers ever show any loose toner, or paper dust, clean the covers with a slightly damp cloth.

Occasionally lower the carrier station and wipe the carrier station with a slightly damp cloth. Leave the carrier station in the down position until the inside is fully dry.



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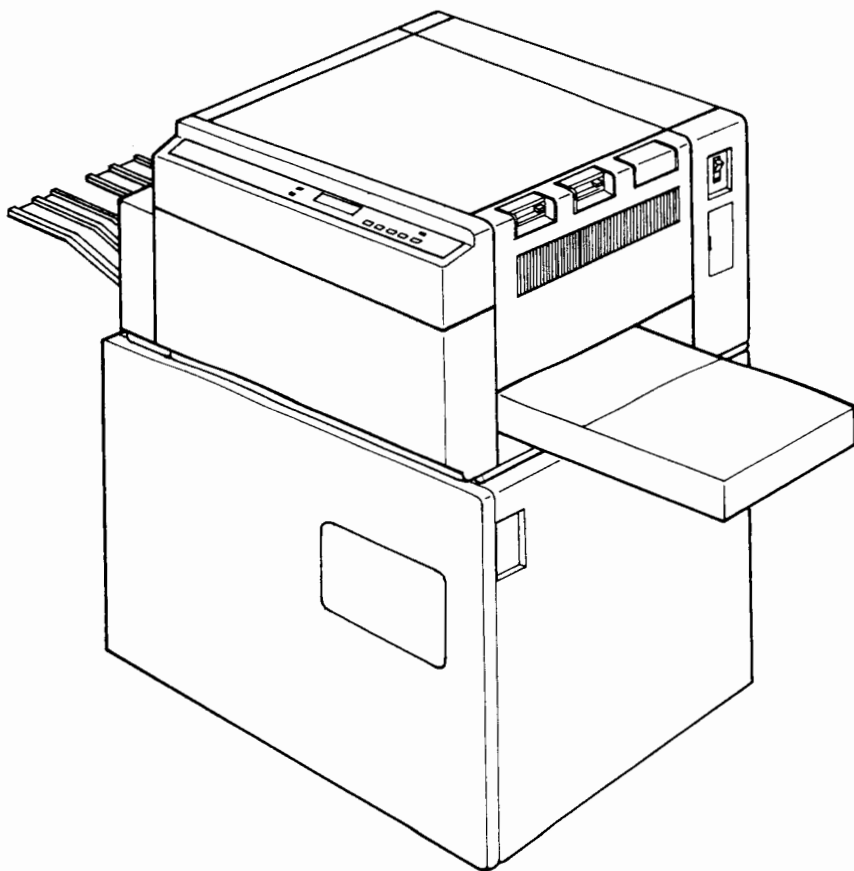
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FUJITSU RX7300E LASER PRINTER USER'S MANUAL



RX7300E

48FH5013E-04

WARNING: This printer is a Laser Class 1 device as defined in BS4803 and IEC 825 specifications.

Printing is carried out using a laser beam. The laser is entirely contained within an enclosed housing and cannot present any risk whatsoever to the user.

Any operation on the printer other than as defined in the supplied user manuals should not be attempted other than by an authorised Fujitsu representative.

Federal Communications Commission Radio Frequency Interference Statement for United States Users

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

NOTE: The length of power cord must be 3 m or less.

NOTE: An unshielded plug or cable may cause radiation interference. The printer is designed for use with a properly shielded interface cable. A non-shielded interface cable must not be used. The shield must be connected directly to the chassis of the printer. The cable length must be 3 m or less.

For German Users

Dieses Gerät entspricht als Einzelgerät den Funkentstörungsanforderungen der Postverfügung Nr. 1046/1984 bzw. der Grenzfläche B nach VDE 0871/6.78.
Das Kabel muß abgeschirmt und unter 3 Meter lang sein.

For Canadian Users

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radio-électriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Règlement sur le brouillage radio-électrique édicté par le ministère des Communications du Canada.

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FX-80 is a trademark of Seiko Epson Corporation

IBM Proprinter is a trademark of International Business Machines Corporation

Diablo 630 is a trademark of Diablo Systems Incorporated

HP Laserjet+ is a trademark of Hewlett Packard

Motorola MC68020 is a trademark of Motorola Corporation

Qume Sprint 11 is a trademark of Qume Corporation

Dataproducts is a trademark of Dataproducts Corporation

48FH5013E-04 October 1989

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PREFACE

This manual describes the operation of the Fujitsu RX7300E Laser printer as manufactured at the time of publication.

We strongly recommend that you read the Quick Start section and Section 1; Setting Up Your Printer before unpacking your printer. Please follow the unpacking instructions very carefully. All packaging is reusable and should not be cut or damaged.

Every effort has been made to ensure that the information included in this manual is complete and accurate. Fujitsu has reviewed this material but cannot be held responsible for any errors or omissions.

Fujitsu has other publications for this printer. Please request additional publications from your dealer or authorised Fujitsu representative.

We reserve the right to make changes and improvements to this product without obligation to incorporate these changes and improvements into units previously shipped.

SUPPLIES, OPTIONS AND PUBLICATIONS

A number of additional supplies, options and publications are available for your printer. Contact your dealer for additional information.

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FUJITSU LIMITED

STANDARD FEATURES

Thank you for purchasing this high quality laser printer. Your printer will provide years of high speed, reliable and versatile printing.

The printer is a multi-purpose, 300 dots per inch laser printer. It has been designed to satisfy most word processing, data processing and graphic printing requirements. Standard features include:

MULTI-EMULATION

The Laser Printer will emulate many other commercially available printers, including the IBM Proprinter, Hewlett Packard LaserJet+, Qume Sprint 11, Epson FX-80, Diablo 630 and Fujitsu M304X Line Printer.

ADVANCED CONTROL PANEL

The advanced, 16 character LCD control panel enables you to change all of the standard printer settings for just one document, until the printer is reset or switched off or permanently. Facilities of the control panel include selection of emulation mode, paper orientation (North, South, East or West), print font, margins and line spacing.

HIGH QUALITY OUTPUT

Your printer operates at a resolution of 300 dots per inch both horizontally and vertically. The quality of output is ideal for use as part of a Desk Top Publishing (DTP) system. Also, the printer uses the LAYOUT Document Description Language (DDL) for advanced page layout and graphics printing.

SIMPLICITY OF OPERATION AND MAINTENANCE

The toner cartridge will print approximately 6000 sheets of A4 size paper at 4% of black dot ratio. Changing the cartridge and replenishing the paper tray are quick and easy operations.

HIGH SPEED OUTPUT

The printer will output approximately 17 A4 size sheets per minute.

WIDE RANGE OF FONTS

The printer has seven basic resident fonts, with the option to add others either on IC card (see Font Card Manual) or as download fonts from your computer.

QUIET OPERATION

The almost silent, vibration free operation is ideal for the office environment.

STANDARD INTERFACES

Both Centronics parallel and RS-232C serial interfaces are available to ensure that your printer will operate with almost all host systems. But your printer is either Centronics parallel or RS-232C serial interface.

USING THIS MANUAL

This manual is designed to help you install, set up and use your printer. It is written for both the novice and the experienced user and presents the information in the order that you are most likely to need it.

Quick Start - lists the steps you should take to set up and operate the printer.

Section 1 Setting Up Your Printer - describes the unpacking procedure, the printer's main components, how to run the printer's self test and how to connect it to a computer.

Section 2 Options - describes optional extras to help you make the most of your printer.

Section 3 Using the Control Panel - gives a detailed explanation of how to use the printer's control panel to set up the printer to suit your particular needs. This section includes information on check messages.

Section 4 Printer Care - gives advice on how to keep your printer in good operating condition and provides troubleshooting procedures. This section also includes a re-packing procedure.

Section 5 Command Sets - this section gives brief details of the emulation modes available on the printer. For further details of these modes and their command sets, refer to the Programmer's Manual.

Appendices - additional information on the resident and IC Card fonts, character set tables and printer and interface specifications.

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APPLICATION SOFTWARE SETUP

You usually need to let your applications software know what printer you are using so the appropriate commands may be sent to the printer during printing of text and graphics.

Don't worry if this printer is missing from the list of printers which are compatible with your application software. Because the printer is so versatile and has so many emulation modes, there is sure to be one or more modes which will work with your software.

The following table shows the printer option you should choose on the application software and the emulation/operating mode you should set on the printer:

Software Printer Setting	Printer Mode Setting
Diablo 630	DIABLO
Epson FX-80	FX80
Epson FX-85	FX80
Epson FX-100 (sub set)	FX80
Epson FX-185 (sub set)	FX80
Fujitsu M304X Line Printer	LP
Hewlett Packard LaserJet	LJET
Hewlett Packard LaserJet+	LJET
IBM Proprinter	PROPRIN
Qume Sprint 11	QUME

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QUICK START

The Quick Start section provides a brief guide to setting up the printer. It includes details of connecting the printer to the AC supply, the host computer, fitting the paper tray and producing a test print.

QUICK START CHART

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Connect interface cable	Type of interface and cable connection	P 1-12

Refer to Section 3 of this manual for information on changing the operational setup of the printer via the control panel on the front of the printer.

UNPACKING THE PRINTER

Refer to the instructions in Section 1 of this manual for instructions on unpacking the printer. Take care to keep all packaging materials for later use for storage or re-shipment of the printer.

PARTS CHECKLIST

Check that you have the following items and that they are all in good condition:

Printer
Developer unit
Photoconductor drum
Paper cassette with lid
Output paper tray
Face down stacker with tray
AC power cable
Blower brush

POSITIONING THE PRINTER

Before setting up your printer, take care to select a suitable position for the printer, taking note of the following precautions:

- * Avoid places which are exposed to direct sunlight
- * Avoid naked flames or high temperatures or humidity
- * Avoid places subjected to excessive vibration
- * Avoid dust, gas outlets and areas of high ozone concentration
- * Avoid any magnetised materials

- * Avoid a power supply shared with equipment producing excessive electrical noise or power degradation through load variation
- * Avoid using a power cable longer than 3 metres
- * Ensure the installation site is stable and level
- * Ensure adequate ventilation
- * Ensure the paper supply is stored in an area of low humidity
- * Ensure the ambient temperature in the area where the printer is to be operated does not fall below 10 degrees C or rise above 35 degrees C.

FIT THE PHOTOCONDUCTOR DRUM

Refer to the instructions in Section 1 of this manual on fitting the photoconductor drum. Take care not to touch the outer surface of the photoconductor drum or damage it in any way as this will adversely affect print quality.

FIT THE DEVELOPER UNIT

Refer to the instructions in Section 1 of this manual on fitting the developer unit.

FIT THE FACE DOWN STACKER AND PAPER TRAYS; INPUT AND OUTPUT

Note that the printer may be used without the face down stacker. This item turns each output sheet of paper face down so that a finished stack of paper is in the correct order, page 1, 2, and so on. The face down stacker has its own output tray.

Ensure that the paper loaded into the input cassette is clean and uncreased. If the paper has been stored in a high-humidity environment, the paper will crease as it passes through the printer.

'Riffle' the paper to prevent sheets becoming stuck together and causing paper jams.

Slide the face down stacker into the left side of the printer, taking care to push it firmly in until it clicks home.

CONNECT POWER CABLE AND SWITCH ON

Ensure that the AC power cable is no longer than 3 metres.

PRINT TEST SHEET

Print-engine Test Print

1. Open the small door on the right side of the printer.
2. Press the TEST PRINT button.

If the check light comes on, the printer may still be warming up - wait until the check light goes off.

The printer will issue a print-engine test print of horizontal lines.

To start continuous test printing, hold down the TEST PRINT button for more than one second. The printer will continue printing test sheets until the TEST PRINT button is pressed again.

Software Test Print

Press the SELECT key four times, pausing briefly between presses. The LCD will show 'SETUPS' and the current paper size and a test print will be produced. The test print shows the current date, time and printer setup condition, number of sheets printed, paper sizes and hopper and stacker options.

Now press the SELECT key a further three times, followed by one press of the END key and another of the SELECT key. The printer will now issue a sheet giving the names and examples of all currently available fonts.

If the density of the print is unsatisfactory, adjust either the coarse or fine density controls.

After adjusting the density in this way, it is necessary to print around 15 sheets to confirm the change.

CONNECT THE DATA CABLE

Make sure that you are using the correct data cable.

Parallel Interface Cable - the connector is a 36-pin, shielded Centronics type; AMP DDK 57FE-30360 or equivalent. See the appendix on Interface Specifications at the back of this manual.

RS-232-C Serial Interface Cable - the connector is a D type 25 pin, CANON DB25 or equivalent. See the appendix on Interface Specifications at the back of this manual.

Your printer cable may need some pin reassignments depending on the type and model host computer used. Contact your dealer for details of any necessary modifications.

PREPARING THE PRINTER FOR USE

Using the Parallel Interface

Simply choose the appropriate operating mode for the printer, as described in Section 3 of this manual, The Control Panel. You may also have to alter the parallel interface timing mode - also as described in Section 3 under the heading 'SETUP: parallel'.

Using the Serial (RS-232-C) Interface

Select the operating mode you require as described in Section 3 of this manual. You may also need to alter the communications parameters (baud rate, number of data and stop bits and so on) as also described in Section 3 under the heading 'SETUP: serial'.

SECTION 1

SETTING UP YOUR PRINTER

UNPACKING THE PRINTER

For Trained Personnel

The outer box is assembled by means of 10 plastic fasteners around the base of the box. All ten of these fasteners should be removed.

Note: Do not split the top of the box.

To remove the plastic fasteners, grip the centre portion and pull it out (see Figure 1.1). You need to grip the centre portion with a pair of strong pliers. Pull out the centre portion of the fasteners, and then remove whole fasteners from the box.

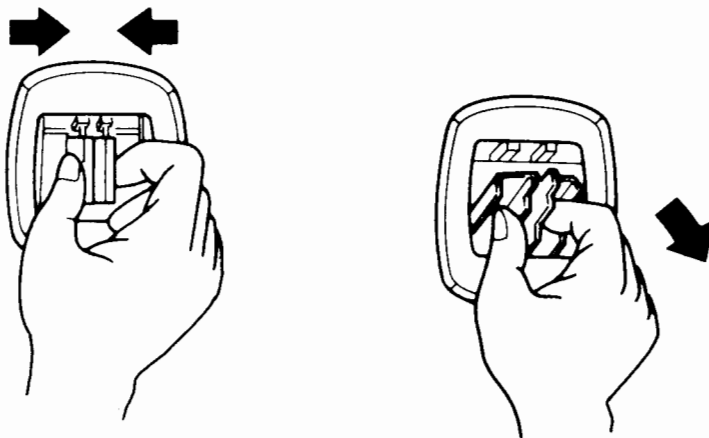


Figure 1.1 Removing the plastic fasteners

Lift off the outer box. Inside is a sealed watertight pack. Carefully split the foil with a sharp knife, near to the bottom of the pack.

The pack contains three boxes; the larger of these contains the printer, the smaller contains the printer accessories and face-down stacker.

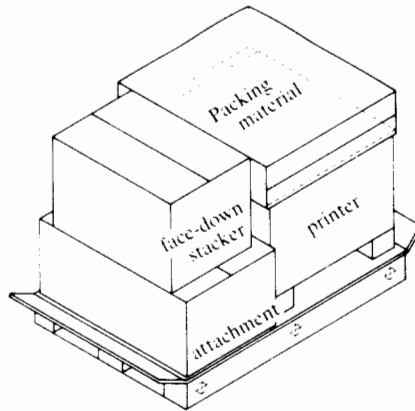


Figure 1.2 The printer box and accessory box

Place the larger box on the floor near to its final operating location. The printer box has four plastic ring fasteners like the outer box and four square plastic fasteners.

Remove the four ring fasteners as described above. Remove both parts of the fasteners from the box. Remove the four square fasteners by squeezing the two inner handles and pulling them out. Completely remove the fasteners from the box.

Lift off the outer part of the box. Do not split the box, or damage it in any way. The printer is wrapped in polythene between two polystyrene carriers. Remove the top carrier and open the polythene wrapper.

Note: If any shipping damage is noticed, immediately inform your dealer/distributor or shipping agent.

Lift the printer out of the bottom carrier. Keep all the boxes and packaging for storage or reshipment of the printer.

Note: It is advisable for two people to lift the printer.

Remove the sealing tape from the top of the accessory box. The printer accessories are packed in bags of shredded packing material. Put the packing on one side, keeping it for later storage or reshipment of the printer.

PARTS CHECK LIST

Ensure that you have received the items shown below:

Printer
Developer unit
Photoconductor drum
Paper cassette with lid
Output paper tray
AC power cable
Puffer blower

You should have also received in a separate box the face down stacker with its own output paper tray.

POSITIONING THE PRINTER

Before setting up your printer, take care to select a suitable position for the printer, taking note of the following precautions:

- * Avoid places which are exposed to direct sunlight
- * Avoid naked flames or high temperatures or humidity
- * Avoid places subjected to excessive vibration
- * Avoid dust, gas outlets and areas of high ozone concentration
- * Avoid any magnetised materials
- * Avoid a power supply shared with equipment producing excessive electrical noise or power degradation through load variation
- * Avoid using a power cable longer than 3 metres
- * Ensure the place is stable and level
- * Ensure adequate ventilation
- * Ensure the paper supply is stored in an area of low humidity
- * Ensure the ambient temperature in the area where the printer is to be operated does not fall below 10 degrees C or rise above 35 degrees C.

GENERAL DESCRIPTION

Pull down the covers on the front and right of the printer. The diagram on the following page shows the inside of the front of the printer.

FITTING THE PHOTOCONDUCTOR DRUM

For Trained Personnel

Before fitting or removing the photoconductor drum, if the developer unit is already fitted, lift the developer locking bar and pull the unit out slightly. This allows the photoconductor drum to slide into the printer without contacting the developer unit. If you do not free the developer unit in this way you will damage the photoconductor drum.

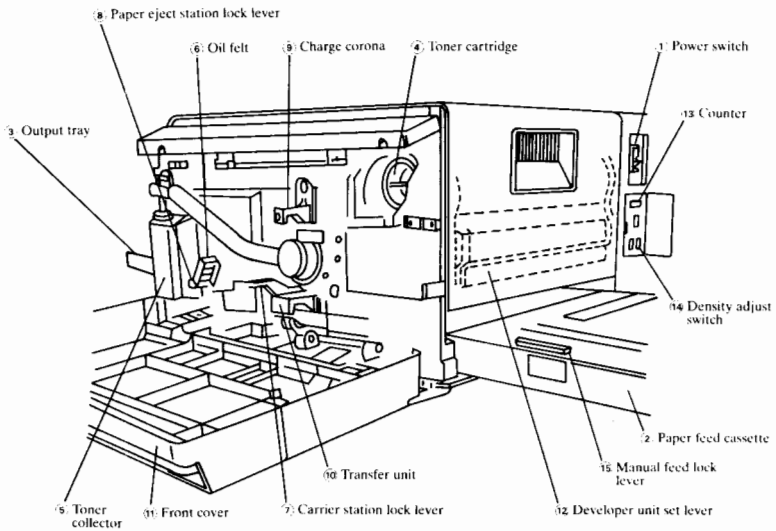


Figure 1.3 Inside the Printer

1. Power switch
2. Paper feed cassette
3. Output tray (shown without face down stacker)
4. Toner cartridge
5. Toner collector
6. Oil felt
7. Carrier station lock lever
8. Paper eject station lock lever
9. Charge corona
10. Transfer unit
11. Front cover
12. Developer unit set lever
13. Counter
14. Density adjustment controls
15. Manual feed lock lever

The photoconductor drum has a very smooth, polished outer surface - at no time should you touch the outer surface of the drum, or let any other material touch the drum. Damage to the surface of the drum will result in deterioration of print quality.

Lower the carrier station locking lever (figure 1.3 item 7) and pull out the charge corona unit (figure 1.3 item 9) and place it on a level surface.

Rotate the photoconductor drum locking handle anticlockwise by 90 degrees, then pull the photoconductor drum locking handle out and put it on a level surface.

Stand the photoconductor drum box on end, taking care to ensure it is the correct way up. Carefully remove the sealing tape from the top of the box and open it fully.

Holding the drum by the inside (figure 1.4), lift it out and insert it slowly onto the inner drum in the front of the printer.

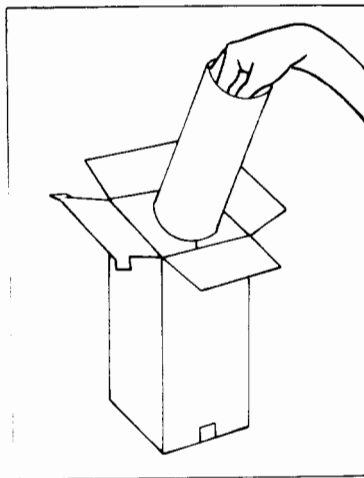


Figure 1.4 The print drum

Slide the drum all the way in and push the end gently until it stops taking care not to touch the outside of the drum.

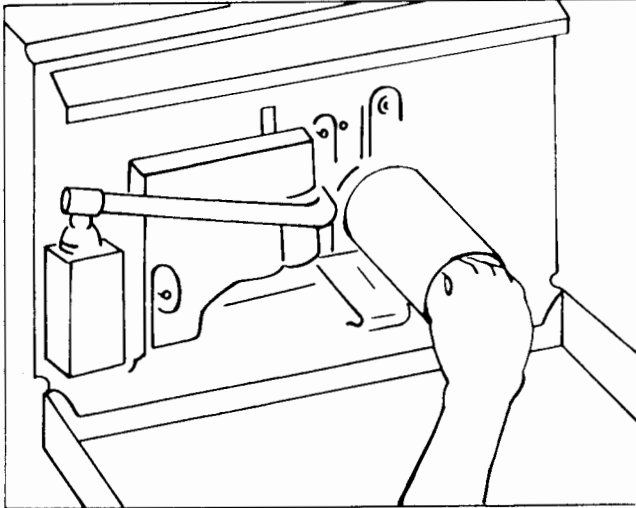


Figure 1.5 Fitting the photoconductor drum

Slide the photoconductor drum locking handle back into position, taking care to fit the positioning plate onto the two positioning pins on the printer.

Rotate the photoconductor drum locking handle clockwise by 90 degrees, then replace the charge corona unit, sliding it all the way in until it stops.

Lift the carrier station locking level until it locks in place.

FITTING THE DEVELOPER UNIT

For Trained Personnel

Open the developer unit pack and remove all packing materials from the unit.

Rotate the drive gear on the developer unit in the direction shown in figure 1.6.

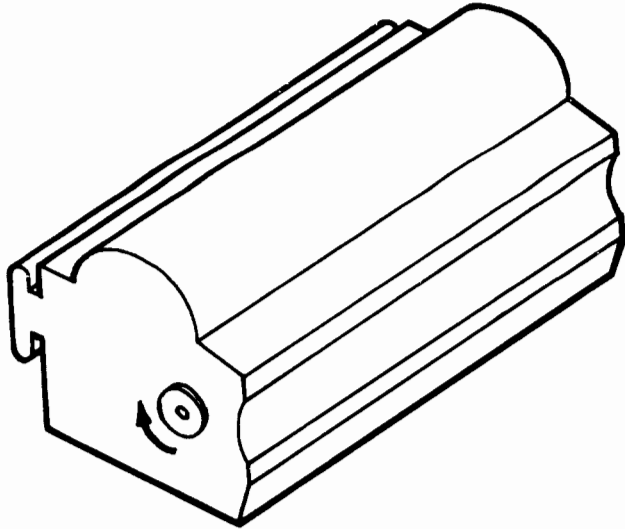


Figure 1.6 Rotating the drive gear on the developer unit

Holding the developer unit by the green plastic rail, slowly offer it into the right side of the printer (figure 1.7).

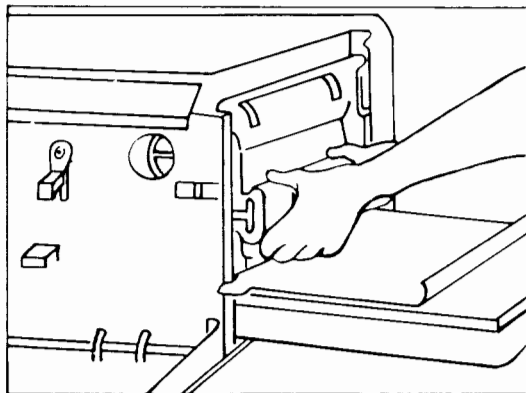


Figure 1.7 Inserting developer unit

NOTE: DO NOT ALLOW THE FULL WEIGHT OF THE DEVELOPER UNIT TO REST ON THE PRINTER COVER AT ANY TIME.

Slide the developer unit all the way in until it clicks home.

At the bottom of the developer unit is a metal locking bar. Press this down at both ends until the locating lugs slot fully into the horizontal locking plate.

If you cannot press the locking bar all the way down until it engages in the locking plate, carefully remove the developer unit and rotate the drive gear inside the right of the printer, as shown in figure 1.8.

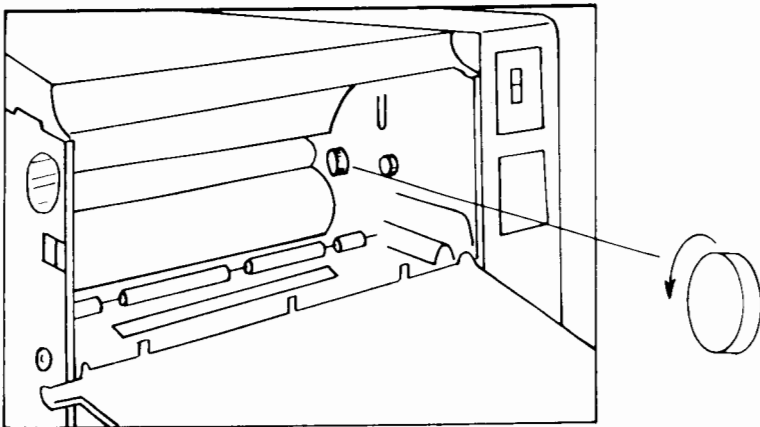


Figure 1.8 Rotating the drive gear

Slide the developer unit back in and push until it clicks home and Press the developer unit locking bar down to lock the developer unit in place. Finally, close the printer's side and front covers.

FILLING AND FITTING THE PAPER CASSETTE

First, make sure that the paper is clean and crumple-free. Take a sheaf of paper - about 250 sheets, or half a packet - and bend it forwards and backwards (figure 1.9) to ensure sheets do not stick together.

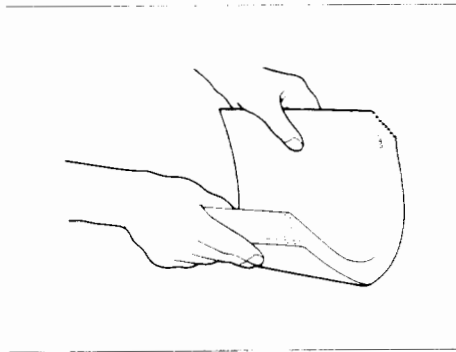


Figure 1.9 Preparing the paper

Slide the paper under the corner holders of the cassette and rock the cassette backwards and forwards to settle the paper.

Replace the cassette cover and fit the cassette into the right side of the printer (figure 1.10).

Make sure the sheet guide in the cassette cover is pulled fully back (figure 1.11).

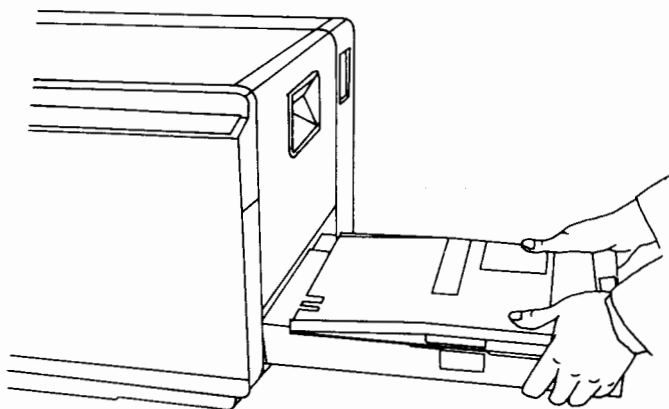


Figure 1.10 Replace paper cassette

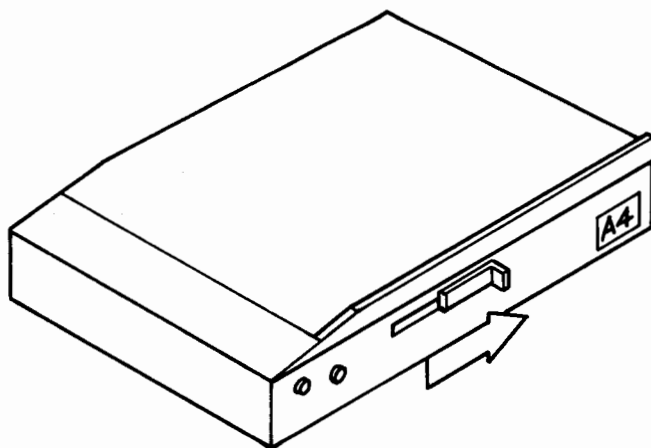


Figure 1.11 Manual feed slide back

FITTING FACE DOWN STACKER AND OUTPUT TRAY

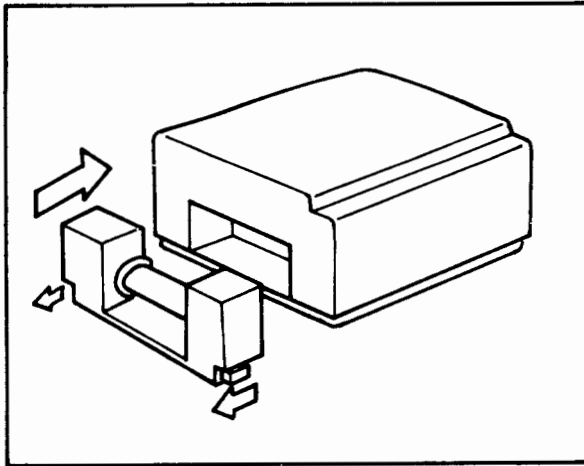


Figure 1.12 Fitting Face down stacker

Push the face down stacker into the left side of the printer, taking care to push it firmly in until it clicks home. Lift the three transparent paper restrainers and slot the two lugs of the stacker output tray into the holes under the paper restrainers.

If the face down stacker is not used, fit the two supporting lugs on the output paper tray into the slots at the left of the printer.

FITTING THE DATA CABLE

Push the connector on the data cable firmly into the data interface on the back of the printer.

Close the two wire restraining clips at the side of the data interface (Centronics only) or fix the two securing screws at the sides of the data interface (RS232 only).

Note: The interface connectors and the hopper connector are clearly labelled, make sure you connect the data cable to the correct connector.

FITTING THE AC POWER CABLE

Unwrap the AC power cable and connect it to the power socket on the back of the printer.

Connect the power cable to a nearby AC mains supply.

Note: If you use a power extension cable, the power supply to the printer may be weakened. Do not use a power cable longer than 3 metres in length.



SECTION 2

OPTIONS

The hopper options below are available.

LARGE CAPACITY HOPPER

A large capacity hopper takes approximately 1000 sheets of paper and acts as a printer table. Using the hopper allows long print runs to be undertaken with a minimum of fuss.

SECOND HOPPER

The second hopper fits underneath the printer and enables the printer to switch between, for example, different sizes or colours of paper, or plain paper and headed stationery either under software control or as directed from the control panel.

SECTION 3

THE CONTROL PANEL

GENERAL DESCRIPTION

The operator control panel is on the front of the printer. By using the keys on the control panel you can access all of the facilities of the printer, including the self test routine, fonts, type sizes, emulation and operation modes. The LCD screen and the status lights provide information about the current status of the printer. The panel consists of:

1. Power status light
2. On-line status light
3. 16 character LCD display
4. Control keys (five keys)
5. Check status light

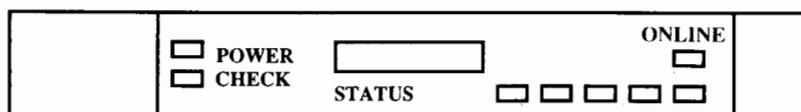


Figure 3.1 The Control Panel

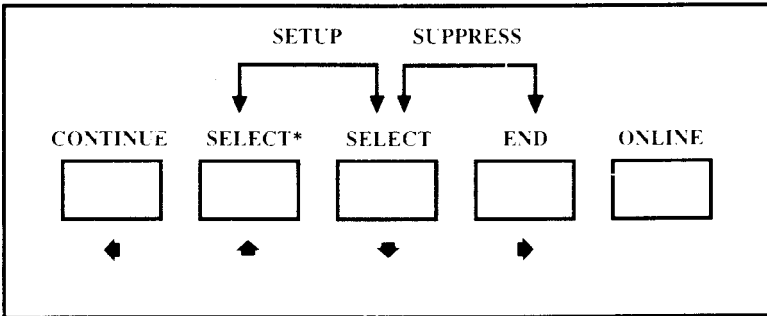


Figure 3.2 The Control keys

THE POWER STATUS LIGHT

The amber power status light indicates that the printer is connected to the mains and that the printer is switched on. (The power on/off switch is on the right side of the machine.)

THE ONLINE STATUS LIGHT

The green on-line status light is used to indicate when the printer is on-line or off-line. When the printer is on-line, data may be received and printed out. To switch the printer off-line, press the ONLINE key beneath the on-line status light. A pause signal will be sent to the computer, preventing it from sending any data to the computer until the printer is returned to the on-line state.

THE LCD DISPLAY

The LCD display is used to show the current state of the printer. A variety of display modes and messages may be seen at any one time, these are explained in the relevant sections of this manual.

THE CONTROL KEYS

The control panel has five keys whose functions are as follows:

The ON-LINE Key

The ON-LINE key may be used to switch the printer on-line or off-line. When the printer is on-line, the On-line Status Light will be on. When the printer is off-line it will be unable to receive any further data until it is switched on-line.

The CONTINUE Key

This key is used to cause the printer to continue operation in any of the following situations:

Wrong paper size - following the report of a wrong paper size, you may continue using the same size paper by pressing the CONTINUE key. However, when a page has been formatted for a particular size of paper, using the wrong size paper may cause unpredictable results.

Manual feed - In response to a request for a manually fed sheet of paper, you may press the CONTINUE key to feed paper from the currently selected cassette.

Note: Do not press the CONTINUE key after a paper jam as the data for the current page will be lost.

The END Key

At the end of a document, your application software may not send the appropriate code to eject the last sheet of paper. Similarly, if printing is terminated abnormally then the last sheet may not be ejected. To eject the last page of the document, press the END key. If no printable data has been received since the last page was ejected, pressing the END key will have no effect.

The SELECT Key

This key is used to start the process of changing the printer's operation parameters. The changes made are remembered by the printer for only one document, the printer then returns to the state it was in before those changes were made. To store a set of document setup for future use, see the section on the FREEZE item in the SETUP menu and the CUSTOM items in the SELECT menu.

See USING THE MENUS below for a full explanation of these two menus.

In addition to the single use of the five keys, there are two combinations of key presses which have other effects:

SELECT and END (SUPPRESS)

Pressing the SELECT and END keys down together for more than one second causes the remainder of an incoming document to be suppressed. The data will continue to be processed by the printer, but it will not be printed out.

This may be used at any time to abort the printing of a document, for example, if the document has been formatted incorrectly for the current paper size.

You may need to press the END key to eject a page of the document which has been partially processed by the printer and retained in the printer's memory.

◆ and SELECT (SETUP)

Pressing the ◆ and SELECT keys down together for more than one second causes the SETUP menu to be presented. This menu allows you to change communication parameters and other settings which only rarely need to be changed. See USING THE MENUS below for a full explanation of the setup menu.

THE CHECK STATUS LIGHT

When the red check status light is on, a check condition has occurred. This means that there has been an error which the printer cannot resolve and has therefore halted operation. When the check status light is on, the host computer will be unable to send further data to the printer and may appear to 'hang'. A message will be displayed on the printer's LCD display. A list of possible messages and their meanings is included at the end of this section.

THE DISPLAY: THE FREE STATE

When the printer is first switched on, the LCD display will show the date and time in the format:

JAN 01 00:00:00

The time (on the right of the display) will be updated every second. Setting the time is explained in an appendix to this manual, but for the moment, you may leave it as it is.

When the date and time are displayed, the printer is in the FREE state. It is waiting for data from a host computer or changes in operating mode from the control panel.

THE DISPLAY: THE BUSY STATE

When data is being received and/or printed, the display will enter the BUSY state. The left of the display will show the document number and page number. For example, while the printer is working on page 10 of document 5, the left of the display will show:

5 . 10

The whole page image is created in the printer before printing begins and when one page is being printed, data for the next is being processed. To indicate that the next page is being processed, a plus sign is displayed after the document and page number. For example, when the display shows:

5 . 10+

the printer is processing page 11 of document 5.

The page number is updated as the printer begins printing that page. So when the printer is processing, for example, the first page of document 6 the screen shows:

6 . 0

When multiple copies of each page are being printed, the page number displayed stays the same for each.

Each time the printer starts to print a page, the right of the display shows the current paper size in use. For example, the display:

6 . 4 A4

indicates that the current paper size is A4. Also, if the paper hopper or second cassette feed is selected, or automatic feed switching, the current feed is also displayed. For example:

6 . 5 C2 A4

shows that the secondary cassette is in use and contains A4 paper.

THE DISPLAY: THE WAIT STATE

During the processing of a document, if the printer is held up for more than a second by the absence of data from the host computer, it enters the WAIT state.

While in the WAIT state, the display shows the document and page number at the left as described above. The right of the display shows the time. For example, the display:

7.5+	00:00:00
------	----------

indicates that the printer is waiting for data of page 6 of document 7.

MAKING A TEST PRINT

When you first switch the printer on, the printer will take a few seconds to initialise and warm up. If you try to send data to the printer during this time the check light will come on until the printer is ready for use. When the check status light goes off, you may test the printer and determine the current print settings by making a test print.

Press the SELECT key four times, pausing briefly between presses. The LCD will show 'SETUPS' and the current paper size and a test print will be produced. The test print shows the current date, time and printer setup condition, number of sheets printed, paper sizes and hopper and stacker options.

Now press the SELECT key a further three times, followed by one press of the END key and another of the SELECT key. The printer will now issue a sheet giving the names and examples of all currently available fonts.

Note: You can also make a print-engine test print by pressing the TEST PRINT button which lies behind the small door on the right of the printer. This produces a pattern of horizontal lines at top and bottom in printable area.

USING THE MENUS

To set up the printer to your exact requirements, a system of menus and sub-menus is used. Menu items are displayed on the LCD display and the leftmost four keys are used to move from menu to menu and make selections. In addition to the key names used above, these keys are also marked with arrows. To move to the left or right in a menu, press the ◀ or ▶ keys. To select the menu item currently displayed, press the ▼ key. To move up a level from any position in a menu to the previous menu, press the ▲ key.

The left of the screen always shows the name of the current menu or sub-menu which you are viewing. If you are not sure where you are, look at the name of the menu and refer to the menu diagrams on the following pages.


When you have reached the lowest menu level and selected the option you require, press the ▼ to register the selection. An equals sign (=) will appear by the selection to show that this is the currently selected setting in that menu.

A vertical bar in front of a menu item simply shows that that is the first item in that menu.



There are two top-level menus, the SETUP menu (figure 3.3) and the SELECT menu (figure 3.4):

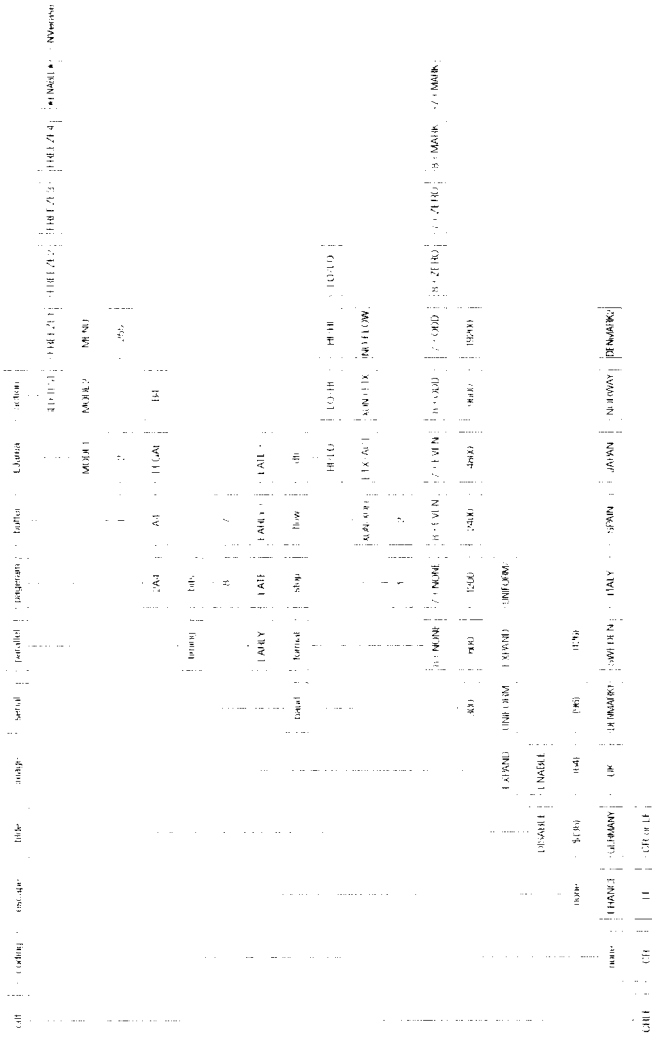
THE SETUP MENU

The SETUP menu is used to set the operating parameters of the printer to your exact requirements. It is most likely that you will set up the printer for use with a particular computer and not need to change the parameters of SETUP until the printer is used as part of another system.

Press the  and the SELECT keys together and hold them down for at least one second. The LCD display will now show:

```
*SETUP*|crlf
```

This indicates that you have entered the SETUP menu, and the first item in that menu is crlf. Press the  or  keys to move through the other menu items.



Dotted boxes indicate menu items which are only present under certain circumstances. See text for details.

Figure 3.3 The SETUP Menu

Here is the full list of items in the SETUP menu and their uses:

crlf	characters accepted as end of line delimiter
coding	character set language
tilde	alternative escape sequence
serial	serial communication parameters
parallel	parallel communication parameters
pageram	memory size for page imaging
buffer	size of communication buffer
action	diagnostics and system management

If you change the emulation mode in the SELECT menu (see below) to LJET, an additional item will be added to the SETUP menu:

LJarea	choice of logical printable area
--------	----------------------------------

If you change the emulation mode in the SELECT menu (see below) to FX80 or PROPRIN, an additional item will be added to the SETUP menu:




image	choice of interpretation of graphic images
-------	--

If you change the emulation mode in the SELECT menu (see below) to LAYOUT, an additional item will be added to the SETUP menu:

escape	defines alternative escape character
--------	--------------------------------------

SETUP: crlf

The available settings of this option are CRLF, CR, LF, CRorLF. The factory setting is CRLF.

Your host computer or application software may send at the end of each line a carriage return character (CR), a line feed character (LF) or both. This option allows you to set the appropriate mode on the printer to comply with your computer and/or software. Press the  or  keys until the required option is displayed and press the  key. An equals sign (=) will appear in front of that option to show that this is the currently selected setting.

If you send a single spaced document to the printer and it appears double spaced, set this option to CRLF. If you send a document and it appears with all of the lines printed on top of one another, set the crlf option to CR.

SETUP: coding

When you select the coding option from the SETUP menu, a further menu is presented. This menu consists of the different language character sets which are resident. The options are none, FRANCE, GERMANY, UK, DENMARK1, SWEDEN, ITALY, SPAIN, JAPAN, NORWAY and DENMARK2.

The factory setting for the coding parameter is none.

SETUP: tilde

The tilde option in the SETUP menu allows you to use the character sequences TILDE CIRCUMFLEX (~ ^) and TILDE TILDE CIRCUMFLEX (~ ^^) instead of the escape sequences ESC BEL and ESC ESC BEL which have special meanings.

The two options within the tilde are DISABLED and ENABLED.

The factory setting is DISABLED.

If you are unable to use the escape sequences with your host computer or application, set this option to ENABLED.

SETUP: serial

If your printer is connected to the host computer via a serial interface, select the serial option from the SETUP menu to set up the communication parameters.

The serial option leads to a further sub-menu containing the communications parameters for the serial interface. Select each item in the serial menu in turn and select the setting appropriate for your host computer's serial port.

SETUP: serial: baud

This option is used to set the speed of data transfer from computer to printer (baud rate). The options are 19200, 9600, 4800, 2400, 1200, 600 and 300. Use the fastest setting allowed by your host computer.

SETUP: serial: format

The format option leads to a further sub-menu containing the list of data transfer formats allowed by the printer. The options consist of two parts, the number of data bits (7 or 8) and the parity setting (NONE, EVEN, ODD, ZERO or MARK). The options are 8+NONE, 7+NONE, 8+EVEN, 7+EVEN, 8+ODD, 7+ODD, 8+ZERO, 7+ZERO, 8+MARK and 7+MARK.

SETUP: serial: stop

This option allows you to set the number of stop bits sent with each character. The options are 1 or 2.

SETUP: serial: flow

The flow option allows you to set the type of handshaking used to pause and continue data transfer between the host computer and printer.

The options available are XON/XOFF, ETX/ACK, XON+ETX and NO FLOW.

SETUP: serial: dtr

The dtr option allows you to set the type of DTR (data terminal ready) signal used by the printer, high or low. The options are:

HI/LO	dtr high for ready and low for not ready
LO/HI	dtr low for ready and high for not ready
HI/HI	dtr permanently high
LO/LO	dtr permanently low.

The factory settings for the serial parameters are:

baud	9600
format	8+NONE
stop	1
flow	XON/XOFF
dtr	HI/LO

SETUP: parallel

If the printer is connected to the host computer via a parallel interface, select the parallel option from the SETUP menu to set the timing of the handshaking signal used to pause and continue data transfer.

Select parallel and another menu containing just two items is displayed. The items are timing and bits.

The first sets the timing of the parallel interface handshaking signal. If you are not sure which setting to use, try each one in turn in the following order until you can successfully print out a document of several pages. The options allowed are EARLY, LATE, EARLY+ and LATE+.

The second item under parallel, bits, sets the number of data bits passed by the parallel interface, 7 or 8.

The factory setting for the parallel parameters are EARLY+ and 8.

SETUP: pageram

The pageram option allows you to control the amount of printer memory to be allocated for page imaging, and consequently the amount of memory which will be left as user area for downloading. The options within the pageram are as follows;

- | | |
|-------|--|
| A4 | The printer allocates a single page memory area for A4. You can use up to and including A4 and/ or Letter size paper only. |
| LEGAL | The printer allocates a single page memory area for Legal. You can use up to and including Legal size paper. |
| B4 | The printer allocates a single page memory area of B4. You can use any paper size supported by this printer. |
| 2A4 | The printer allocates two page memory areas for A4. You can use any paper size supported by this printer. |

You can get the size of the allocated page memory area(s) and free area for user by printing the setup report (refer to the SELECT: action for operation).

The factory setting of the pageram parameter is 2A4.

SETUP: buffer

The buffer option allows you to select the size of the communication buffer to be used to store data from your host. The size can be specified with the value representing a number of kilobytes (from 1 to 255 kilobytes). When the buffer is selected, the LCD screen shows;

```
buffer = 16
```

To increase the buffer size, press the \blacktriangleright key; to decrease the buffer size, press the \blacktriangleleft key. When the required buffer size is displayed, press the \blacktriangledown key to confirm the selection. To take effect, a change to the buffer size must be saved (by FREEZE1), and then the printer reset by selecting the reset: *SYSTEM* option in the SELECT: action, or by the power off and on again.

The factory setting of the buffer parameter is 16.

When you select the larger buffer, though the user area for downloading is reduced, it provides the greater potential for freeing your host for other activities.

When you select the smaller buffer, it increases the user area and reduces the possibility for your host to detect device time-out with the printer.

SETUP: action

The action option in the SETUP menu leads to a further sub-menu containing, initially, six items; SELFTEST, FREEZE1, FREEZE2, FREEZE3, FREEZE4 and ENABLE.

SETUP: action: SELFTEST

Select the first item, SELFTEST, to instruct the printer to carry out a number of internal diagnostic tests.

SETUP: action: FREEZE1 to FREEZE4

The FREEZE options allow you to record in memory the full range of settings in the SETUP and SELECT menus. Those settings may then be called into operation every time you need to use that particular setup. You should set the printer options to the most useful settings and then select FREEZE1 from the SETUP menu. These settings are then stored in memory and can be recalled at any time.

The next most likely setting can then be saved in the same way to another area of memory by selecting FREEZE2 and so on to FREEZE4.

To recall the setups you have saved with FREEZE1 to FREEZE4, see the section on the CUSTOM1 to CUSTOM4 options in the SELECT menu.

SETUP: action: *ENABLE*

Selecting the *ENABLE* option allow you to carry out a number of privileged operations on the settings of the printer. After you have selected the *ENABLE* option, another item will be added to the SETUP: action menu; NVerase (see below).

SETUP: action: NVerase

This option will only appear in the SETUP: action menu after selection of the *ENABLE* option above. Menu settings are not affected by the use of this option.

SETUP: image

The LJarea option is only included in the SETUP menu if the mode option in SELECT menu (see SELECT: mode later in this section) is set to FX80 or PROPRIN. This option defines the way in which graphic images are presented in both mode, and allows you to select the function of MSB control commands. There are four options; UNIFORM, EXPAND, UNIFORM/ and EXPAND/.

The UNIFORM option causes bit-map graphic images to be printed exactly as they are received from the host computer.

The EXPAND option causes the horizontal distance between the dots of the graphic image to be periodically readjusted to allow for the difference between the resolution of the laser printer and the emulated, dot-matrix printer.

The UNIFORM/ option causes bit-map graphic images to be printed exactly as they are received from the host computer, and, in FX80 mode, MSB control commands to be same effect with Alternate Character Set Selection commands. For details, refer to the Programmer's Manual.

The EXPAND/ option causes the horizontal distance between the dots of the graphic image to be periodically readjusted to allow for the difference between the resolution of the laser printer and the emulated, dot-matrix printer, and, in FX80 mode, MSB control commands to be same effect with Alternate Character Set Selection commands. For details, refer to the Programmer's Manual.

The Factory setting of the image parameter is EXPAND.

SETUP: escape

The escape option is only included in the SETUP menu if the mode option in the SELECT menu (see SELECT: mode later in this section) is set to LAYOUT. This option allows selection of an **alternative escape character for use as part of a LAYOUT command.**

When escape is selected from the SETUP menu, a further sub-menu is presented containing the five items shown below:

escape none

This setting disables recognition of any alternative escape character.

escape \$(36)

This setting accepts the dollar sign (\$) as an alternative to the usual escape character. The dollar sign has the decimal ASCII value 36 (24 hexadecimal).

escape @(64)

This setting accepts the @ character as an alternative to the usual escape character. The @ character has the decimal ASCII value 64 (40 hexadecimal).

escape `(96)

This setting accepts the grave sign (`) as an alternative to the usual escape character. The grave sign has the decimal ASCII value 96 (60 hexadecimal).

escape ~(126)

This setting accepts the tilde (~) as an alternative to the usual escape character. The tilde has the decimal ASCII value 126 (7E hexadecimal).

The factory setting of the escape parameter is \$(36).

SETUP: LJarea

The LJarea option is only included in the SETUP menu if the mode option in SELECT menu (see SELECT: mode later in this section) is set to LJET. This option allows selection of printable area setting modes. There are three options; MODE1, MODE2 and MENU.

Selecting the MODE1 option allows you to set the printable area compatible with previous version of the printer.

Selecting the MODE2 option allows you to set the printable area fully compatible with HP LaserJet printers. In this mode, parameters set in the SELECT: margins menu are no effect.

Selecting the MENU option allows you to set the printable area following to the margins of the SELECT: margins option (see SELECT: margins later in this section).

The Factory setting of the LJarea parameter is MODE2.

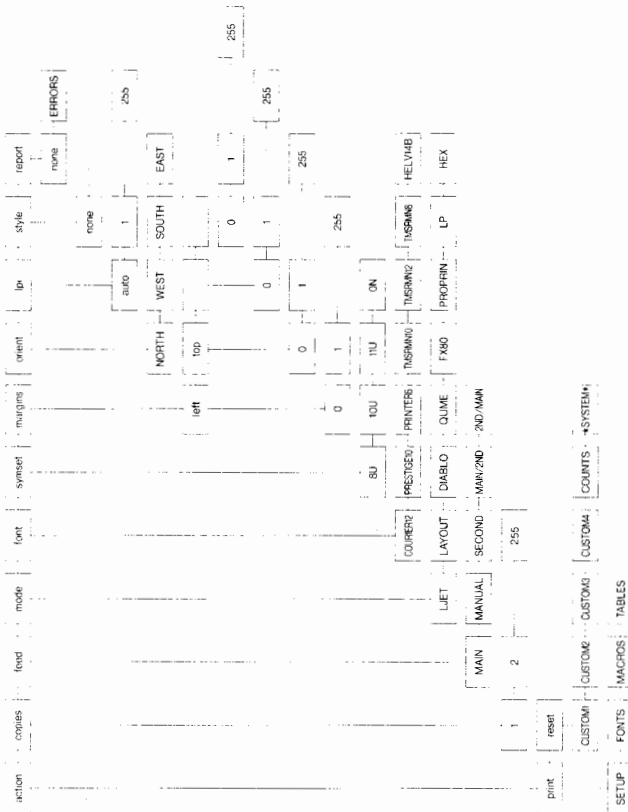
THE SELECT MENU

The SELECT menu is used to set a number of facilities and operating modes on the printer, such as number of copies of each document, emulation mode, font, margin sizes and so on.

There are two ways of using the SETUP menu; you may either make changes to the operating mode of the printer which will last for just one document, or you may change to a new operating mode which will be stored in memory as one of four resident setups (see the FREEZE options under action in the SETUP menu described earlier). Next time you switch the printer on, the settings will be taken from the internal settings as decided by the FREEZE1 option in the SETUP: action menu (see above).

To make temporary changes which last for only one document, enter the SELECT menu by pressing the SELECT key, change the setting required for the next document and press the ONLINE key. After the next document has been printed, the latest settings will be forgotten and the printer will return to the state it was in before the last set of changes were made.

To make changes which will remain in effect until the printer is switched off and will be stored for later use, enter the SELECT menu by pressing the SELECT key, make the required changes and press the ONLINE key. Now enter the SETUP menu (described earlier in this section) and select FREEZE1, 2, 3 or 4. The changes will then be stored as one of four resident setups. See action: reset: CUSTOM1 to 4 later in this section for restoring previously saved setups.



Dotted boxes indicate menu items which are only present when optional hopper (Second Hopper, Large Capacity Hopper) is installed.

Figure 3.4 The SELECT Menu

The items in the SELECT menu are as follows:

action	test print and housekeeping functions
copies	number of copies of each document
feed	paper feed selector
mode	printer emulation mode
font	font selector
symset	font symbol set selector
margins	margin widths
orient	page orientation
lpi	lines per inch
style	macro style selector
report	error report mode selector

SELECT: action

When action is selected from the SELECT menu, a further sub-menu is presented containing the items print and reset. Print allows you to print a test sheet showing the current print setup, resident and downloaded fonts, resident or downloaded style macros or font character tables.

Reset allows you to reset the state of the printer to its default condition, or to restore a previously saved setup for a particular type of document.

The item setup leads to a further menu containing the items CUSTOM1, CUSTOM2, CUSTOM3, CUSTOM4, COUNTS and *SYSTEM*.

The items CUSTOM1 to 4 are the names of previously saved setups which may be saved with the FREEZE1 to 4 options under action in the SETUP menu (see SETUP menu earlier in this chapter).

SELECT: copies

The copies option in the SELECT menu allows you to set the number of copies printed of each page (maximum 255). When copies is selected, the LCD screen shows:

```
copies=1
```

To increase the number of copies, press the \blacktriangleright key; to decrease the number of copies, press the \blacktriangleleft key. When the required number of copies is displayed, press the \blacktriangledown key to confirm the selection.

The factory setting of the copies parameter is 1.

SELECT: feed

The feed option allows you to select the paper feed source. The options within the feed are as follows;

MAIN	main paper cassette
MANUAL	manual feed from the manual guide on top of main cassette

If the optional second hopper or large capacity hopper is fitted underneath the printer, the following options is also offered;

.SECOND	optional hopper
MAIN/ SECOND	alternate feed from main cassette and optional hopper, starting with main cassette When one paper source is empty, the printer switches automatically to feed from the other.
SECOND/ MAIN	alternate feed from optional hopper and main cassette, starting with optional hopper When one paper source is empty, the printer switches automatically to feed from the other.

The factory setting of the feed parameter is MAIN.

SELECT: mode

The printer offers a number of modes which allow it to emulate other commercially available printers, operate in LAYOUT Document Description Language (DDL) mode or in HEX mode, where a hexadecimal and ASCII printout is produced of the incoming data stream.

The modes offered are as follows:

LP - emulates the Fujitsu M304X Line Printer

HEX - produces a hexadecimal and ASCII file dump of the incoming data stream. For example, a file containing part of the nursery rhyme "Mary had a little lamb" would be printed as follows:

```

000000 1B 45 1B 28 73 50 1B 29 73 31 50 1B 26 6C 4C 1B .E:(sP)s1P&LL.
000010 26 6C 4F 1B 26 6C 45 1B 26 61 30 39 36 30 56 1B &LO.&LE.&a0960V.
000020 28 73 31 30 48 1B 26 61 30 36 34 38 48 1B 26 6B (s10H.&a0648H.&k
000030 31 32 48 4D 61 72 79 1B 26 61 31 30 30 38 48 68 12HMary.&a1008Hh
000040 61 64 1B 26 61 31 32 39 36 48 61 1B 26 61 31 34 ad.&a1296Ha.&a14
000050 34 30 48 6C 69 74 74 6C 65 1B 26 61 31 39 34 34 40HLittle.&a1944
000060 48 6C 61 6D 62 0D 1B 26 61 31 30 38 30 56 1B 26 Hlamb.&a1080V.&
000070 61 30 36 34 38 48 57 68 6F 73 65 1B 26 61 31 30 a0648HWhose.&a10
000080 38 30 48 66 6C 65 65 63 65 1B 26 61 31 35 38 34 80Hfleece.&a1584
000090 48 77 61 73 1B 26 61 31 38 37 32 48 77 68 69 74 Hwas.&a1872HWhit
0000A0 65 1B 26 61 32 33 30 34 48 61 73 1B 26 61 32 35 e.&a2304Has.&a25
0000B0 32 30 48 73 6E 6F 77 0D 1B 26 61 31 32 30 30 56 20Hsnow.&a1200V
0000C0 1B 26 61 30 36 34 38 48 41 6E 64 1B 26 61 30 39 .&a0648HAnd.&a09
0000D0 33 36 48 65 76 65 72 79 77 68 65 72 65 1B 26 61 36Heverywhere.&a
0000E0 31 37 32 38 48 74 68 61 74 1B 26 61 32 30 38 38 1728Hthat.&a2088
0000F0 48 4D 61 72 79 1B 26 61 32 34 34 38 48 77 65 6E HMary.&a2448Hven
000100 74 0D 1B 26 61 31 33 32 30 56 1B 26 61 30 36 34 t.&a1320V.&a064
000110 38 48 54 68 65 1B 26 61 30 39 33 36 48 6C 61 6D 8HThe.&a0936Hlam
000120 62 1B 26 61 31 32 39 36 48 77 61 73 1B 26 61 31 b.&a1296Hwas.&a1
000130 35 38 34 48 73 75 72 65 1B 26 61 31 39 34 34 48 584Hsure.&a1944H
000140 74 6F 1B 26 61 32 31 36 30 48 67 6F 0D 1B 26 61 to.&a2160Hgo.&a
000150 37 39 32 30 56 1B 26 61 31 39 34 34 48 31 0D 0D 7920V.&a1944H1.
000160 0C 1B 45 .E

```

Figure 3.5 Hexadecimal Printout

LJET - emulates the Hewlett Packard LaserJet+ laser printer. All LaserJet+ modes and commands are available, with the addition of a number of other facilities not available on that printer. For a full list of the LaserJet+ commands and control codes, refer to the Programmer's Manual.

LAYOUT - offers the use of the LAYOUT document description language (DDL). LAYOUT offers a wide range of printer control, text formatting, page formatting and graphics facilities. A more complete description is provided in the Programmer's Manual.

DIABLO - emulates the Diablo 630 printer. All Diablo 630 modes and commands are available, with the addition of a number of other facilities not available on that printer. For a full list of the Diablo 630 commands and control codes, refer to the Programmer's Manual.

QUME - emulates the Qume Sprint 11 printer. All Qume Sprint 11 modes and commands are available, with the addition of a number of other facilities not available on that printer. For a full list of the Qume Sprint 11 commands and control codes, refer to the Programmer's Manual.

FX80 - emulates the Epson FX-80 dot matrix printer. All FX-80 modes and commands are available, with the addition of a number of other facilities not available on that printer. For a full list of the Epson FX-80 commands and control codes, refer to the Programmer's Manual.

PROPRIN - emulates the IBM Proprinter. All Proprinter modes and commands are available, with the addition of a number of other facilities not available on that printer. For a full list of the IBM Proprinter commands and control codes, refer to the Programmer's Manual.

The factory setting of the mode parameter is LJET.

SELECT: font

The default font may be selected from the seven fonts available by selecting the font option in the SELECT menu. The resident fonts are as follows:

Courier 12 point
Prestige Elite 10 point
TMS RMN 8 point
TMS RMN 10 point
TMS RMN 12 point
HELV 14 point bold
Line Printer 8.5 point

Kinds of font will be increased by inserting Optional IC Card (Font).

The factory setting for the font parameter is COURIER12.

SELECT: symset


The symset option in the SELECT menu causes the available symbol sets for the currently selected font to be displayed.

SELECT: margins


The margins option in the SELECT menu leads to a further sub-menu of the four page margins; left, top, right and bottom. Each of these may be set to any distance in 0.01 inch steps. For example, select margins from the SELECT menu by pressing the \blacktriangledown key. Now press \blacktriangledown again to select left. The LCD screen will show:

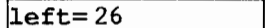
```
left=25
```

showing that the left margin is currently set to 0.25 inches. To increase the margin size, press the \blacktriangledown key once and the number will be incremented by one to 26 and the screen will show:



left 26

indicating a margin size of 0.26 inches. To confirm this setting, press the  key. The screen will now show:



left= 26

the equals sign shows that this is the currently selected setting. Each of the four margins may be set in the same way.

The factory setting for the margins are TOP and BOTTOM, 0.5 inches, LEFT and RIGHT, 0.25 inches.

SELECT: orient

The orient option in the SELECT menu allows you to choose the print orientation on the paper; EAST, NORTH, WEST or SOUTH. The default orientation is NORTH. The four orientations are shown in figure 3.6.

The factory setting for the orient parameter is NORTH.

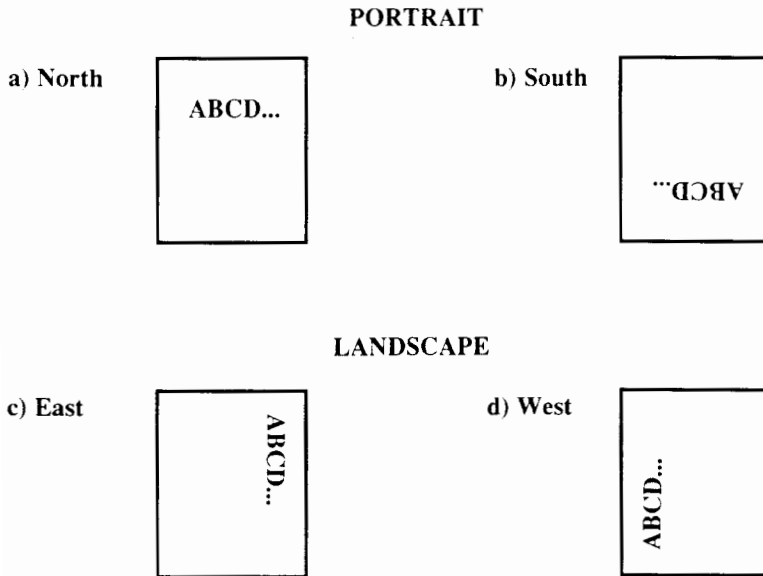


Figure 3.6 Print Orientation

SELECT: lpi

The lpi option in the SELECT menu allows you to specify the number of printed lines per inch (lpi). Select lpi from the SELECT menu by pressing the **▼** key. The screen will show:

lpi=6

To increase the number of lines per inch, press the **▶** key and the number will be incremented with each key press. To decrease the number of lines per inch, press the **◀** key and the number will be decremented with each key press. When the required number is displayed, press the **▼** key to confirm your selection.

A value of auto is used to indicate that the default value for the current mode (see SELECT: mode above) is to be used, or that the number of lines per inch is to be determined by the currently selected font.

SELECT: style

This menu item allows you to load and use a Document Style Macro. When SELECT: style is selected from the menu, the currently resident style macros are listed. If no macros are currently resident the display will show only 'none'.

Whenever a new document is started, the currently selected style macro is loaded and automatically executed as a preparation for the data to be printed.

SELECT: report

The report option in the SELECT menu allows you to have a report of any protocol (mode) errors printed at the end of each document. The two options within report are none and ERRORS. Select ERRORS to see a printout of all errors received or none to suppress the error report.

CHECK MESSAGES

When the check light is on, the printer stops printing for one of the reasons outlined below. You must take action to remove the cause of the check condition; printing will then automatically continue.

When a check condition occurs when the printer is not in the BUSY state, the check message is displayed starting with a question mark (?). When a check condition occurs when the printer is in the BUSY state, the message starts with an asterisk (*). In both cases the check light is lit while the message is displayed.

When a check condition occurs during printing, the LCD display will show one of the following messages:

***C1 Out of Paper**

Cassette 1 (the main paper cassette) is empty. Refill the cassette as described in Section 1 of this manual.

***C2 Out of Paper**

Cassette 2 (the second hopper or large capacity hopper) is empty. Refill the cassette or hopper.

***Out of Paper**

Out of paper in auto-cassette switch mode.

Refill cassette 1 (the main paper cassette) and/or cassette 2 (the second hopper or large capacity hopper).

***C1 Load PAPER**

Cassette 1 should be refilled with paper of the size 'PAPER'. For example, the check message might read '*C1 Load A4', meaning that you should load cassette 1 with A4 size paper.

***C2 Load PAPER**

Cassette 2 should be refilled with paper of the size 'PAPER'. For example, the check message might read '*C2 Load A4', meaning that you should load cassette 2 with A4 size paper.

***Load PAPER**

Request for loading paper in auto-cassette switch mode.

Cassette 1 and/or cassette 2 should be refilled with paper of the size 'PAPER'.

***MANUAL PAPER**

Feed paper of the size 'PAPER' to the manual guide on top of main cassette.

***C1 Unload PAPER**

The paper loaded in cassette 1 with the size 'PAPER', is of the wrong size for that job. Refill the cassette with paper of the correct size.

***C2 Unload PAPER**

The paper loaded in cassette 2 with the size 'PAPER', is of the wrong size for that job. Refill the cassette with paper of the correct size.

***Please Wait**

Printer is temporarily non-operational because of the fuser warm-up, etc. The printer will automatically resume printing operation.

***Hopper Unready**

The large capacity hopper is not ready for operation.

***Hopper Open**

The large capacity hopper cover is open. Close the cover.

***Stacker unready**

The face down stacker is not ready for operation.

***Stacker Full**

The face down stacker is full. Remove paper from the stacker.

***Cover Open**

The front cover of the printer is open. Close the cover.

***Toner Empty**

The toner cartridge is empty. Refer to Section 4 of this manual for instructions on changing the toner cartridge.

***Collector out**

The used toner collector is not in position in the printer. Set the collector.

The figure below shows how paper is carried through the printer:

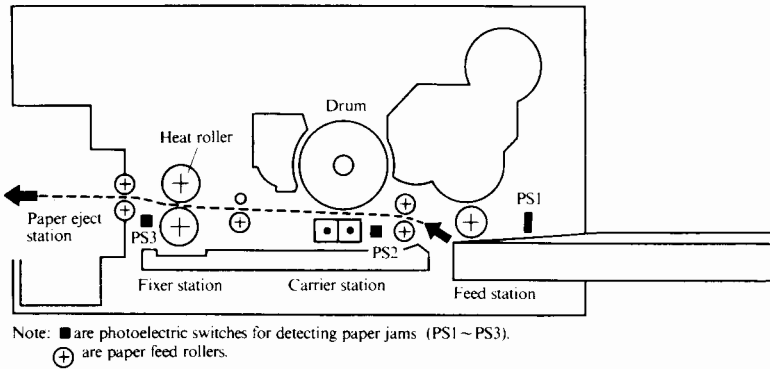


Figure 3.7 Paper path and paper sensors

*Paper Jam 2

Paper did not reach PS2, check the paper path to the right of PS2 for jammed paper. See figure 3.7.

*Paper Jam 3

Paper did not reach PS3, check the paper path to the right of PS3 for jammed paper. See figure 3.7.

*Paper Jam 4

Paper did not clear PS2, check the paper path in the immediate area of PS2 for jammed paper. See figure 3.7.

*Paper Jam 5

Paper did not clear PS3, check the paper path in the immediate area of PS3 for jammed paper. See figure 3.7.

*Paper Jam 6

Paper did not successfully clear the second hopper or the large capacity hopper, check the exit of the hopper for jammed paper. See figure 3.7.

In addition to the above messages, all of which can be dealt with by the user, there are a number of messages which relate directly to the various parts of the printer's software and hardware. Should any of the messages below be displayed, contact your dealer for further advice.

*Printer Pause	Printer is temporarily non-operational
*Fuser	Fuser abnormality
*Laser Power	Laser power abnormality
*BD Cycle	Beam Detect cycle abnormality
*Scan Motor	Scan motor abnormality
*Main Motor	Main motor abnormality
*Status Error	Print module status unobtainable
R1 Data Faulty	Resident font data in ROM1 is incorrect
R2 Data Faulty	Resident font data in ROM2 is incorrect
R3 Data Faulty	Resident font data in ROM3 is incorrect
NR Data Faulty	Data in non-volatile memory is incorrect.

Additional Check Messages

If any of the following check messages is displayed, remove and re-insert the font card as described in your font card manual. If the check condition persists, try another font card and, if all else fails, contact your dealer for further advice.

MCa Data Faulty	Font data in Card A is incorrect
MCb Data Faulty	Font data in Card B is incorrect
MCc Data Faulty	Font data in Card C is incorrect

SECTION 4

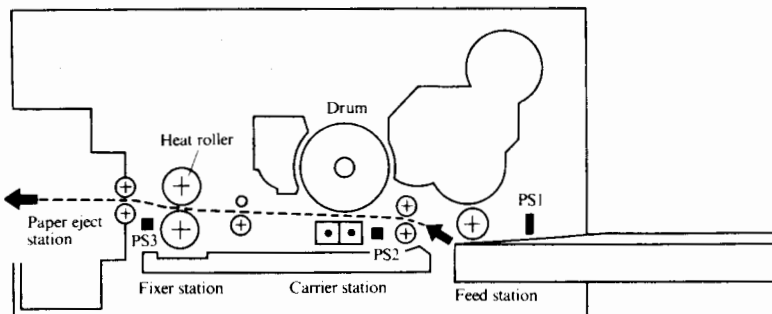
PRINTER CARE

REMOVING A PAPER JAM

Occasionally, perhaps due to excessive humidity, or creased paper, a sheet of paper may become jammed in the mechanism of the printer.

The check status light on the control panel will be lit and the LCD display will show a check message. Refer to the diagram below showing the position of the paper feed sensors, and the list of check messages and their meanings.

The figure below shows how paper is carried through the printer:



Note: ■ are photoelectric switches for detecting paper jams (PS1 ~ PS3).

⊕ are paper feed rollers.

Figure 4.1 Paper Sensor Positions

*Paper Jam 2

Paper did not reach sensor 2, check the paper path to the right of sensor 2 for jammed paper.

***Paper Jam 3**

Paper did not reach sensor 3, check the paper path to the right of sensor 3 for jammed paper.

***Paper Jam 4**

Paper did not clear sensor 2, check the paper path in the immediate area of sensor 2 for jammed paper.

***Paper Jam 5**

Paper did not clear sensor 3, check the paper path in the immediate area of sensor 3 for jammed paper.

***Paper Jam 6**

Paper did not successfully clear the paper input hopper, check the exit of the hopper for jammed paper.

Note: If jammed paper is left in the printer for a long time, the internal heat of the printer may discolour the paper and make it liable to leave paper debris in the print mechanism. You should remove any jammed paper as soon as the jam is detected.

Also, the heat roller (see figure 4.1) may still be hot and should not be touched when removing jammed paper.

BASIC TROUBLESHOOTING

This section is designed to help with any minor problems which may occur from time to time while the printer is in use. If more serious faults occur then you should contact your dealer for further advice.

The list of problems which may occur are followed by a number of remedies. Try each of the remedies listed in turn until the problem is removed. If none of the remedies works, contact your dealer.

Problem: Print too light

Remove transfer unit (figure 1.3 item 10) and carefully clean the transfer wire underneath with the blower brush supplied with the printer. Replace the transfer unit.

Turn the density control (coarse or fine) clockwise and run the test print sequence described in Section 1 of this manual. The density adjustment controls are behind the small door on the right side of the printer.

If the developer unit has been removed recently, perhaps to change the toner cartridge, follow the procedure outlined in Section 1 of this manual to replace the developer unit correctly.

Fit a new photoconductor drum to the printer.

Fit a new developer unit to the printer.

Note: Under no circumstances should you replace the toner cartridge unless the display shows the check message *Toner Empty. Replacing the toner cartridge before the old one is empty can jam the developer unit with toner and cause damage to the printer.

Problem: Print too dark

Turn the density control (coarse or fine) anticlockwise and run the test print sequence described in Section 1 of this manual. The density adjustment controls are behind the small door on the right side of the printer.

Problem: Vertical print density uneven

Remove transfer unit (figure 1.3 item 10) and carefully clean the transfer wire underneath with the blower brush supplied with the printer. Replace the transfer unit.

Remove charge corona wire (figure 1.3 item 9) and carefully clean the corona wire underneath with the blower brush supplied with the printer. Replace the charge corona wire.

If the developer unit has been removed recently, perhaps to change the toner cartridge, follow the procedure outlined in Section 1 of this manual to replace the developer unit correctly.

Fit a new photoconductor drum to the printer.

Problem: Background smudging

Turn the density control (coarse or fine) anticlockwise and run the test print sequence described in Section 1 of this manual. The density adjustment controls are behind the small door on the right side of the printer.

Remove transfer unit (figure 1.3 item 10) and carefully clean the transfer wire underneath with the blower brush supplied with the printer. Replace the transfer unit.

Remove charge corona wire (figure 1.3 item 9) and carefully clean the corona wire underneath with the blower brush supplied with the printer. Replace the charge corona wire.

Fit a new photoconductor drum to the printer.

Fit a new developer unit to the printer.

Problem: Offset print

Remove transfer unit (figure 1.3 item 10) and carefully clean the transfer wire underneath with the blower brush supplied with the printer. Replace the transfer unit.

Remove charge corona wire (figure 1.3 item 9) and carefully clean the corona wire underneath with the blower brush supplied with the printer. Replace the charge corona wire.

Fit a new oil felt to the printer.

Fit a new photoconductor drum to the printer.

Fit a new developer unit to the printer.

CLEANING

When the charge corona wire or transfer unit wire need to be cleaned (see the troubleshooting guide above), follow this procedure: Remove the unit fully from the printer and use the supplied puffer blower to clean all traces of toner powder from inside the unit.

**NOTE: TAKE CARE NOT TO BREAK THE
TRANSFER OR CHARGE WIRE INSIDE THE UNIT.**

Replace the unit, taking care to slide it all the way in and push until it clicks home.

Close the printer cover.

REPACKING YOUR PRINTER

Should you need to put your printer into storage or re-ship it to another location, you should repack the printer carefully, following the instructions in Section 1 of this manual in reverse.

Take care to pack the items carefully, re-using all of the packaging material supplied with the printer both for the printer itself and the accessories.

Seal the foil container with waterproof tape, making sure there are no gaps where moisture could enter the package.

Insert and refix all of the plastic fasteners on both the inner printer box and the outer box.

CHANGING THE TONER CARTRIDGE

One toner cartridge will produce around 6000 printed pages. When the toner cartridge is empty, the display will show the message *Toner Empty. You should replace the toner cartridge with a new one by following the instructions below.

You should not replace the toner cartridge unless the above message is displayed. To do otherwise may damage the printer.

The toner powder can be difficult to remove from clothes and soft furnishings. There may be some toner powder left in the cartridge so follow the instructions carefully and dispose of the old toner cartridge safely.

1. Open the front cover of the printer (The display will show the message *Cover Open.) and turn the toner cartridge anticlockwise by 180 degrees.
2. Gently pull the cartridge out. There may be some toner left inside the cartridge so pull the cartridge out very carefully, keep it level and place it somewhere safe immediately.

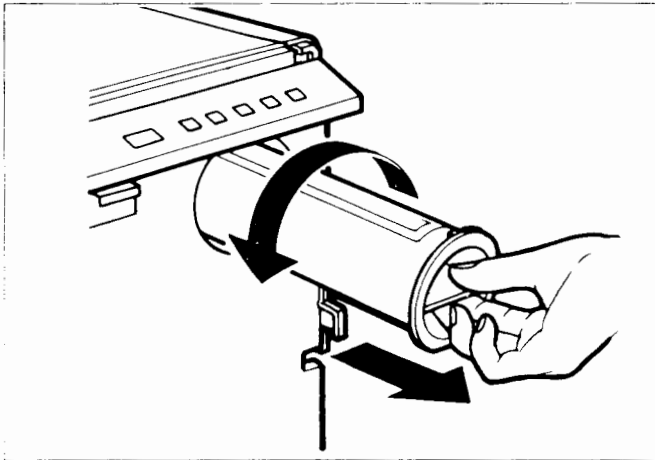


Figure 4.2 Removing the toner cartridge

3. Shake the new toner cartridge from side to side so the toner is laid evenly along the length of the cartridge.
4. Loosen the end of the sealing tape on the cartridge and insert the end of the cartridge into the opening in the printer.

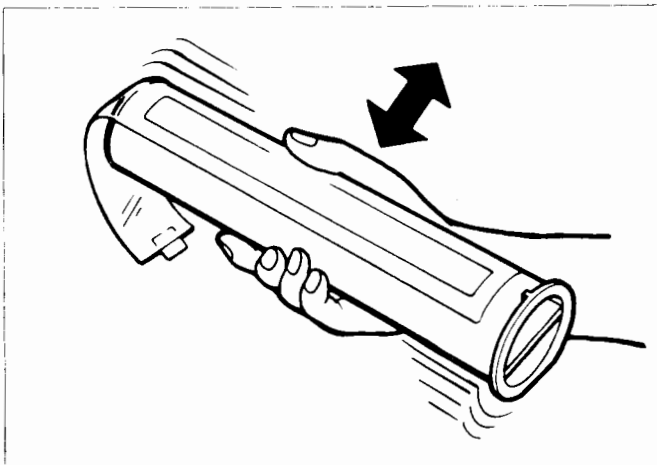


Figure 4.3 Shaking toner cartridge

5. Gently push the cartridge into the printer and keep pulling the seal away from the cartridge as it goes in. As the seal comes away from the cartridge altogether the cartridge should be almost all the way into the printer.
6. Push the cartridge all the way into the printer until it stops.
7. Turn the cartridge clockwise by 180 degrees, so that the handle is level again.

Insert the new toner cartridge while removing seal. Do not turn it until insertion is complete. When it is fully inserted, turn the cartridge 180° clockwise:

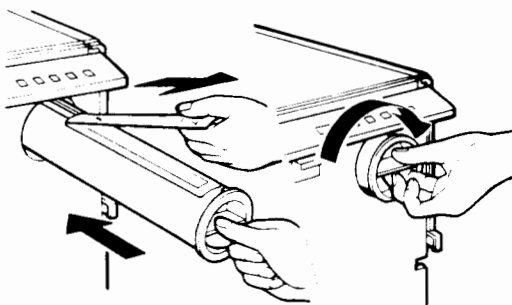


Figure 4.4 Inserting the toner cartridge

8. Tap the top of pipe leading to the used toner collector to free any trapped toner.
9. Remove the toner collector (The display will show the message *Collector Out.) and seal it with the cap provided with the new toner cartridge. Put the used toner collector in the bag provided with the new toner cartridge and dispose of the used toner carefully.
10. Fit the new toner collector to the printer (The display will show the message *Cover Open again.).

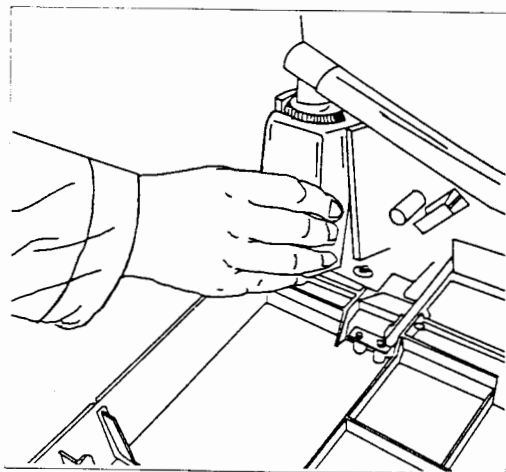


Figure 4.5 Replacing the toner collector

Note: If you do not change the used toner collector when you change the toner cartridge, the mechanism may become jammed with toner, causing damage to the printer.

11. Remove the old oil felt and dispose of it safely. Fit the new oil felt to the printer.

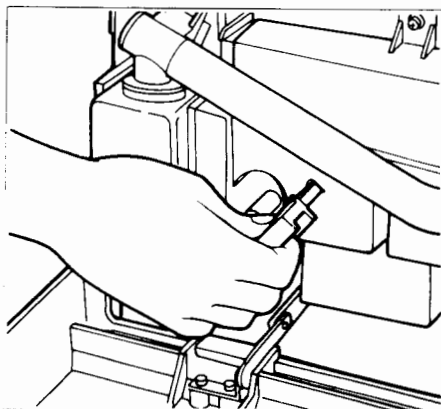


Figure 4.6 Replacing the oil felt

12. Close the front cover of the printer (The display will change to other message, and the initial operation of mechanism will start.).

SECTION 5

COMMAND SETS AND EMULATIONS

The printer offers a number of modes which allow it to emulate other commercially available printers, operate in LAYOUT Document Description Language (DDL) mode or in HEX mode, where a hexadecimal and ASCII printout is produced of the incoming data stream.

The modes offered are as follows:

LP	emulates the Fujitsu M304X Line Printer
LJET	emulates the Hewlett Packard LaserJet+
DIABLO	emulates the Diablo 630
QUME	emulates the Qume Sprint 11
FX80	emulates the Epson FX-80
PROPRIN	emulates the IBM Proprinter
LAYOUT	offers the use of the LAYOUT document description language (DDL)
HEX	produces a hexadecimal and ascii file dump of the incoming data stream

When any of the printer emulation modes is selected, the default settings of that printer are automatically initialized.

Each of the emulation modes has an additional number of command codes which are not available on the emulated printer.

The commands and their uses are fully described in the Programmer's Manual.



APPENDIX A

SETTING THE DATE AND TIME

When the printer is switched on, the LCD display shows the date and time. These may be set to the current date and time. Once set, they will remain in memory, even when the printer is switched off, and will be displayed whenever the printer is in the FREE state. The time will also be displayed when the printer is in the WAIT state.

To set the date and time, first select LAYOUT mode from the control panel as described in Section 3 of this manual; The Control Panel. You must then select *ENABLE* from the item action in the SETUP menu when each item (Date or Time) is set as described in Section 3 of this manual. This enables you to change the date and time as described below.

LAYOUT recognises two commands which alter the data and time respectively as stored in the printer's memory. The commands should be sent to the printer in the following format:

DATE

To set the date to, for example, 26 August 1987, issue to the printer the command:

`$Z.DATE 87:08:26` (year:month:day)

Note the space between DATE and 87.

TIME

To set the time to, for example, 10.30am, issue to the printer the command:

```
$Z.TIME 10:30:00      (hour:minute:second)
```

Note the space between TIME and 10.

To set the time with a little less precision, omit the last colon and the number of seconds, so the command reads:

```
$Z.TIME 10:30        (hour:minute)
```

To issue these commands to the printer, the easiest way is to prepare a document in a word-processor, containing the commands as given above. Use a left margin of 0 characters with no bold, italic or any other print styles other than plain text.

An alternative method is to use a high-level language such as BASIC. In Microsoft BASIC, the following program would set the date and time to those settings given above:

```
For DATE set.  
10 LPRINT "$. DATE 87:08:26"  
20 END
```

```
For TIME set.  
10 LPRINT "$. TIME 10:30:00"  
20 END
```

APPENDIX B

IC CARD FONTS

In addition to the resident fonts in the printer, fonts can be added by using IC cards.

These fit into any of the slots on the right of the printer and are quick and simple to use.

For more details of the fonts available on IC cards, contact your dealer.



APPENDIX C

PRINTER SPECIFICATIONS

Table C.1 Printer specifications

1. Technology	Laser diode and electrophotography	
2. Developing method	Two component magnet brush	
3. Fixing	Heat roller fixing	
4. Mechanical control	Video interface	
5. Print speed (max)	B4	14 sheets/min
	A4	17 sheets/min
	B5	24 sheets/min
	Letter	18 sheets/min
	Legal	14 sheets/min
6. Resolution	300 x 300 dpi	
7. Warming up time	110 seconds max.	
8. First print	20 sec (A4) max.	
9. Paper		
Cassette feed	Size	A4 210 x 297mm (8.3 x 11.7in)
		B4 257 x 364mm (10.1 x 14.3in)
		B5 182 x 257mm (7.2 x 10.1in)
		Letter 216 x 279 (8.5 x 11in)
		Legal 216 x 356mm (8.5 x 14in)
	Thickness	64-90-g/sm (17-24lb)
Manual feed	Size	B4 - A6, Postcard size
	Thickness	64-128g/sm (17-32lb)
		Postcard 157g/sm
10. Paper cassette	Single 250 sheets max. (64g/sm)	
11. Paper stacker	250 sheets max. (64g/sm)	
Paper feed direction		

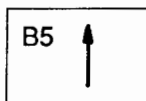
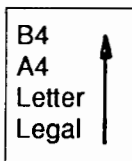
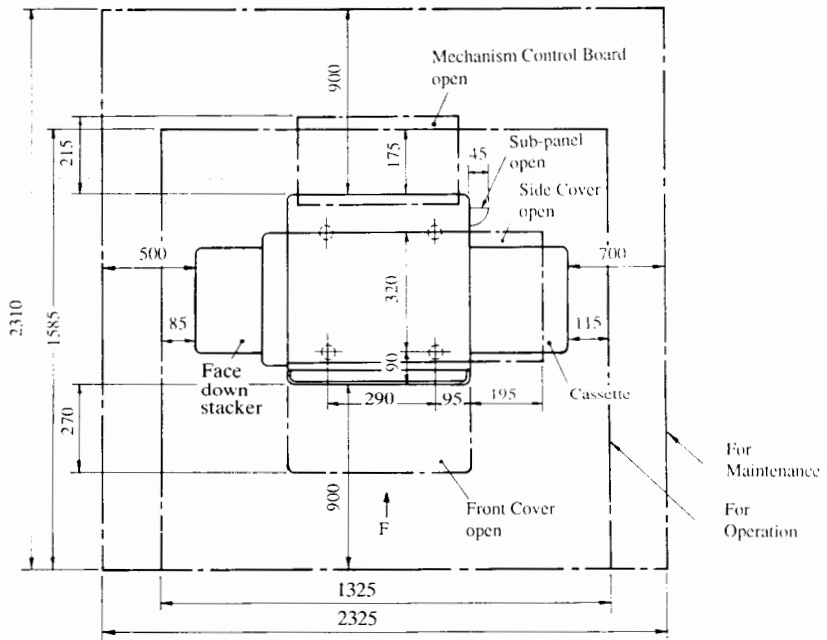


Table C.2 Physical specifications

1. Power requirements	Voltage	120/220/240V AC±10%	
	Frequency	50/60Hz	
	Phase	Single	
2. Dimensions	Width	485mm (19.1in)	Without paper cassette and stacker
	Depth	510mm (20.1in)	
	Height	310mm (12.2in)	
3. Weight		45kg (99lb)	
4. Ambient temperature	Operating	10 - 35 degs C (50 - 95F)	
	Non-operating	0 - 35 degs C (32 - 95F)	
5. Relative humidity		20%RH - 80%RH	
6. Maximum wet bulb temperature		29 degs C (84.2F)	
7. Accoustic noise		Less than 52dBA	
8. Power consumption	850 WATTS	Less than 1 KVA	
9. Service clearance		See figure C.1	

$$\text{BTU/hr} = 2899$$



All measurements in mm.

Figure C.1 Service clearance

EFFECTIVE PRINT AREA

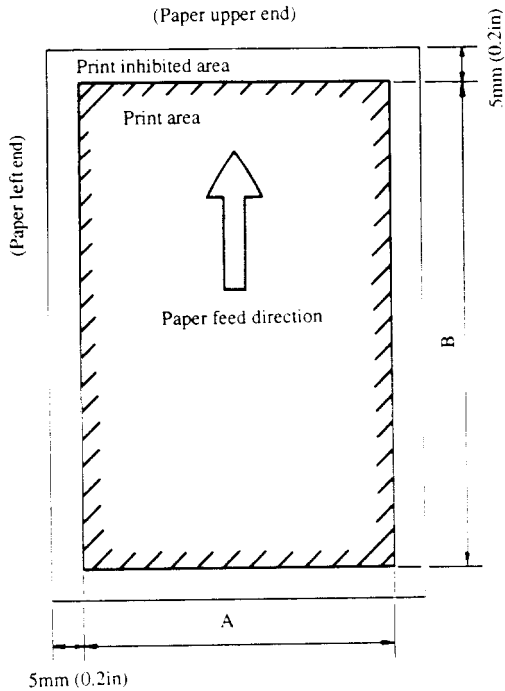


Figure C.2 Effective print area

Print area

	Dimension A	Dimension B
B4	247mm (9.7in)	352mm (13.9in)
A4	200mm (7.9in)	287mm (11.3in)
B5	247mm (9.7in)	172mm (6.8in)
Letter	206mm (8.1in)	270mm (10.6in)
Legal	206mm (8.1in)	346mm (13.6in)

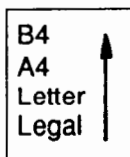
- * Print area in manual feed mode: The area limited by the line 5mm from the edge of the paper.

Note: When paper over 75g/sm is used, the print on the right and left 5mm from the top edge of the print area may not be sharp.

OPTIONS

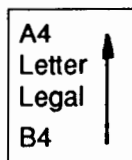
Large capacity hopper

Item		
1. Paper feed		Friction feed
2. Capacity		1000 sheets max. (64g/sm)
3. Paper	Size	B4/A4/letter/Legal
	Thickness	64g/sm - 90g/sm (17 - 24lb)
4. Paper feed direction		



Second cassette unit

Item		
1. Paper feed		Friction feed
2. Capacity		1000 sheets max. (64g/sm)
3. Paper	Size	B4/A4/letter/Legal
	Thickness	64g/sm - 90g/sm (17 - 24lb)
4. Paper feed direction		



Periodic Exchange Pattern

Description	Average life	Remarks
Photoconductor drum	65000 sheets or 6 months	At a rate of 25,000 print/month sheets
Developer unit	65,000 sheets	"
Charge corona	65,000 sheets	"
Transfer unit	65,000 sheets	"
Cleaner unit	65,000 sheets	"
Fuser unit	200,000 sheets	
Backup roller	200,000 sheets	
Ozone filter	130,000 sheets	

Consumables List

No.	Description	Part number	Remarks
001	Paper cassette	B020-7280-V151A	A4
002	Paper cassette	B020-7280-V152A	B4
003	Paper cassette	B020-7280-V153A	B5
004	Paper cassette	B020-7280-V154A	Letter
005	Paper cassette	B020-7280-V155A	Legal
006	Toner unit	B870-1670-T005A	Replace each cartridge after 6,000 sheets.

Note: One toner unit contains 2 toner cartridges, two toner collectors and two oil felts.

APPENDIX D

INTERFACE SPECIFICATIONS

PARALLEL INTERFACE

PARALLEL INTERFACE SIGNALS

Table D.1 shows the Centronics compatible interface signal names and definitions:

Table D.1 Centronics Compatible Parallel Interface Signal Definitions

Signal Name	Signal Pin #	Return Pin #	Direction	Signal Definition
/DSTB	1	19	In	Low level pulse from the host, used as a synchronizing clock for reading data. ACK has been returned before issuing the next DSTB. DSTB is ignored if BUSY is high.
DATA 1	2	20	In	The data lines input from the host. High level is binary 1 and low level is binary 0. DATA 8 is the most significant bit (MSB). For 7-bit codes, DATA 8 can be ignored.
DATA 2	3	21	In	
DATA 3	4	22	In	
DATA 4	5	23	In	
DATA 5	6	24	In	
DATA 6	7	25	In	
DATA 7	8	26	In	
DATA 8	9	27	In	
/ACK	10	28	Out	Low level pulse from the printer, used to indicate that the printer can receive data.
BUSY	11	29	Out	High level indicates printer is not ready to receive data. This signal is issued in one of the following cases: — Input buffer full — Error conditions — Off-Line state (including test and set up modes)
PE	12		Out	High level indicates out of paper.
SLCT	13		Out	High level indicates on-line states. This signal goes off in one of the following cases: — Error conditions — Press the On-Line switch in on-state — Off-Line state (including test and set up modes)
(Reserved)	14			
(Reserved)	15			
SG (Signal Ground)	16			Signal ground level (0 V)
FG (Frame Ground)	17			Frame ground line
(Reserved)	18			
/INPRIME	31	30	In	Low level initializes the printer. When this signal goes on, the printer clears the data in buffers.
/ERROR	32		Out	Low level indicates the printer is in error states
SG (Signal Ground)	33			Signal ground level (0 V)
(Reserved)	34			
-5V	35		Out	Connected to -5 volt through 3.3k ohm resistor.
/SLCT IN	36		In	Low level signal, used for placing the printer in On-Line.

Note: The return pins are connected to ground level (0 V).

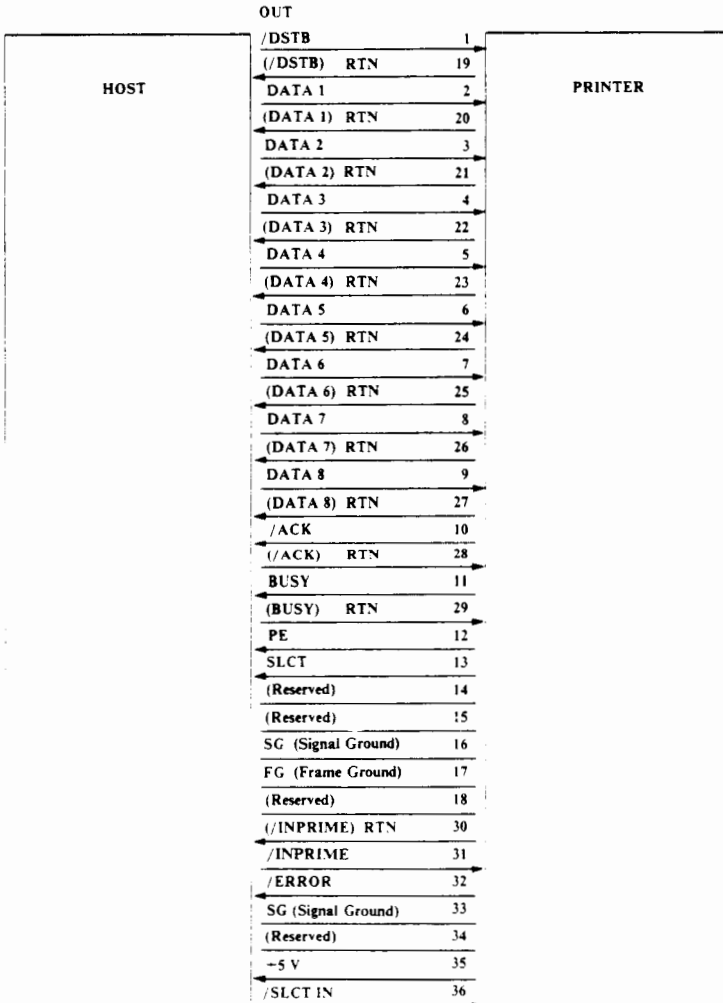


Figure D.1 Centronics Compatible Parallel Interface Signals

PARALLEL INTERFACE SIGNAL TIMING

The printer receives data from the host system in handshake mode, based on BUSY/ACK signals from the printer and /DSTB signals from the host system. The timing of the BUSY signal in relation to the /ACK signal varies in accordance with the control panel settings.

Figure D.2 shows these timings:

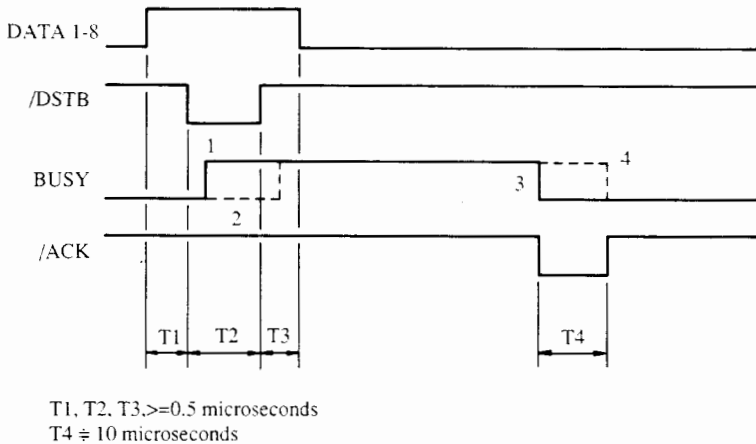


Figure D.2 BUSY/ACK Signal Timings

The BUSY signal timings (1 and 2) against the /DSTB signal and its fall timings (3 and 4) against the /ACK signal can be selected from the SETUP menu on the control panel.

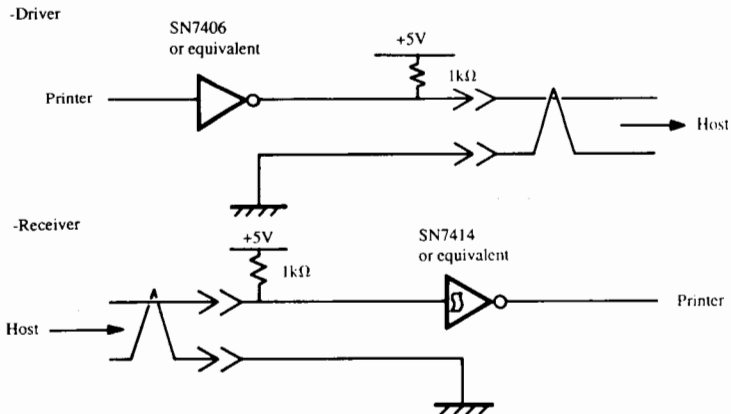
PARALLEL INTERFACE PHYSICAL SPECIFICATIONS

Signal levels must be within the following ranges:

Low	0.0 to +0.4v
High	+2.4 to +5.5v

Note: The signal levels given above are at the interface connector. Incorrect signal levels may be given at power-on and power-off.

The interface signal driver and receiver must be the same as those shown in figure D.3:



**Figure D.3 Centronics Compatible Interface Signal
Driver-Receiver**

The interface connector is an Amphenol-DDK (57FE-30360) or its equivalent.

SERIAL INTERFACE

SERIAL INTERFACE SIGNALS

Table D.2 shows the RS-232C serial interface signal names and definitions:

Table D.2 Serial Interface Signals

Signal Name	Signal Pin #	Direction	Signal Definition
FG (Frame Ground)	1		Protective Ground This circuit is connected internally to the printer's mainframe.
TD (Transmitted Data)	2	Out	The printer can transmit data to the host through this circuit only when the following signals are ON: — RTS, CTS, DSR, DTR
RD (Receive Data)	3	In	Signals on this circuit represent commands and/or print data sent to the printer for execution. This circuit is held in marking (low) while CD is off.
RTS (Request To Send)	4	Out	When this signal is on (low), the printer is requesting the host to send data or is transmitting data to the host. After this signal is turned on and the CTS goes on, the printer begins transmitting data.
CTS (Clear To Send)	5	In	This signal is turned on when the host confirms that the RTS is 0 and data from the printer can be received.
DSR (Data Set Ready)	6	In	When this signal is on, the host is ready to transmit data. When this signal is off, the printer ignores data on RD line.
SG (Signal Ground)	7	—	This line is a signal ground and provides a common reference potential for all interface lines.
CD (Received Line Signal Detector)	8	In	During transmitting data to the printer, the host keeps this line on (low). If this signal is off, the printer ignores data on RD line.
(Reserved)	9-19		
DTR (Data Terminal Ready)	20	Out	When this signal is on, the host can transmit data to the printer. After the power is turned on and the printer logic is cleared, DTR is set on and remains on while the printer is ready for data communication. When this signal is off, the host is disconnected from the communication channel after data transmission.
(Reserved)	21-25		

SERIAL INTERFACE PHYSICAL SPECIFICATIONS

The required signal levels are shown below:

Data Circuits	Control Circuits	Nominal Voltage	Binary State
Marking	OFF	-12	1
Spacing	ON	+12	0

The interface signal driver and receiver must be the same as shown in figure D.4:

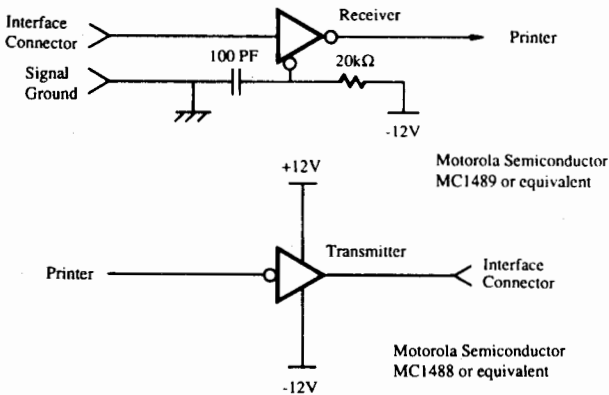


Figure D.4 RS-232C Interface Signal Transmitter and Receiver

The printer end of the interface cable must be a 25-pin D-subminiature Canon or Cinch DB-25P male connector with a metal hood, or its equivalent.

The interface cable should be no longer than 50 feet (15m).

SERIAL DATA FORMAT

Codes used on the Transmitted Data and Received Data lines have the following format:

- * Start bit 1 bit
- * Data bits 7 or 8 bits
- * Parity bit even, odd, zero, mark or none
- * Stop bit(s) 1 or 2 bits
- * Baud rate 300, 600, 1200, 2400, 4800, 9600, 19200

Transmitted Data and Received Data lines are low when they are idle.

PROTOCOLS

When data is transmitted, it must be controlled to prevent an overflow in the buffer, with a resulting loss of data.

To prevent data loss and maintain a high throughput, the interface supports the following data transmission protocols:

- * ETX/ACK
- * XON/XOFF (DC1, X'11'/DC3, X'13')
- * DTR

The protocol may be selected from the SETUP menu on the control panel.

ETX/ACK PROTOCOL

In this protocol, the ETX character is inserted at the end of each data transmission block by the host. The ACK character is transmitted by the printer when it detects the ETX character in the text.

This protocol operates as follows:

- a. Upon completion of its initialisation sequence, the printer transmits an ACK character to the host computer.
- b. On receipt of the ACK character from the printer, the host computer transmits enough data to fill half the print buffer, ending with the ETX character. When printing begins, the host transmits the second half buffer of data, followed by another ETX character.
- c. When the printer has emptied the first data message from the buffer and detected the ETX character, it transmits an ACK character to the host and begins printing the second message.
- d. When the host receives the ACK character, it transmits another half buffer of data, followed by the ETX character.
- e. This process is repeated until the host reaches the end of the current data. When this happens, the host stops sending data and the printer continues until the buffer is empty.

This figure shows ETX/ACK protocol timing.

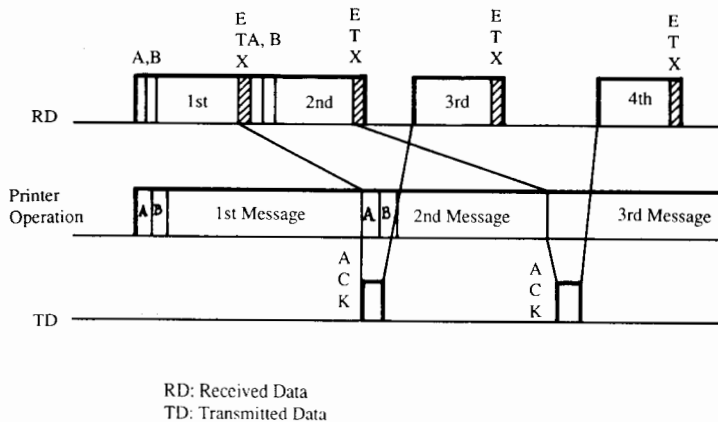


Figure D.5 ETX/ACK Timing Chart

XON/XOFF PROTOCOL

In this protocol, the printer sends the XON character to the host to start data transmission and the XOFF character to stop data transmission. This protocol operates as follows:

a. The printer sends the XOFF character in the following circumstances:

- * The interface buffer is nearly full (less than 256 characters available)
- * The printer is switched from on-line to off-line
- * Operator action is required (paper out, paper jam, toner empty, cover open etc)
- * An error condition such as an engine or printer malfunction is detected.

If the printer detects one of the latter two conditions, a negative acknowledgement character (NAK) is sent to the host computer. This indicates that operator action is required.

b. The printer sends the XON character in the following circumstances:

- * The interface buffer is nearly empty (less than 256 characters left)
- * The printer is switched from off-line to on-line.

This figure shows XON/XOFF timing:

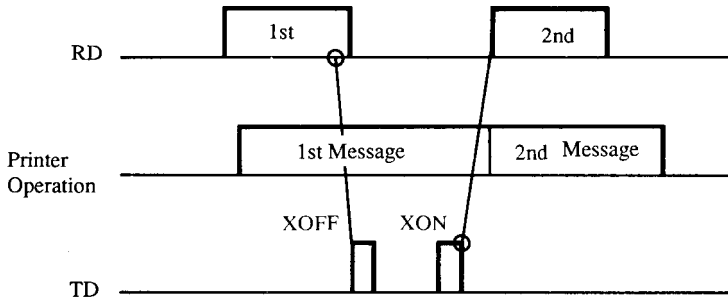


Figure D.6 XON/XOFF Protocol Timing Chart

DTR PROTOCOL

In this protocol, the host can transmit data to the printer only when the DTR signal line is active or ON (HIGH). This protocol operates as follows:

- a. The DTR signal is switched to OFF (LOW) in the following circumstances:
 - * The interface buffer is nearly full (less than 256 characters available)
 - * The printer is switched from on-line to off-line
 - * Operator action is required (paper out, paper jam, toner empty, cover open etc)
 - * An error condition such as an engine or printer malfunction is detected.
- b. The DTR signal is switched to ON (HIGH) in the following circumstances:

- * The interface buffer is nearly empty (less than 256 characters left)
- * The printer is switched from off-line to on-line.

This figure shows DTR protocol timing:

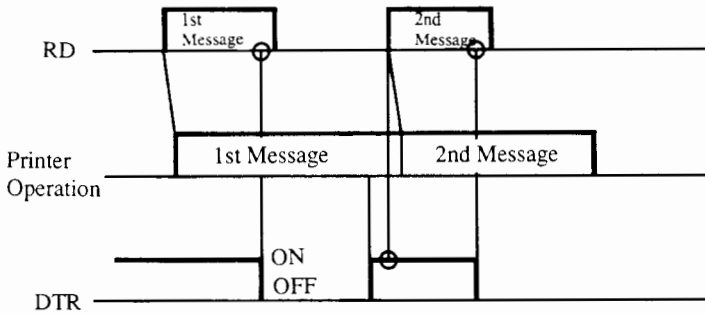


Figure D.7 DTR Protocol Timing Chart

APPENDIX E

CHARACTER SET TABLES

The printer can print out a full set of character tables and lists of fonts, macros and setup parameters. For full details of these operations, refer to Section 3 of this manual, under the heading SELECT: action: print.

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