Preface

Every effort has been made to ensure that the information in this document is complete, accurate, and up-to-date. Oki assumes no responsibility for the results of errors beyond its control. Oki also cannot guarantee that changes in software and equipment made by other manufacturers and referred to in this guide will not affect the applicability of the information in it. Mention of software products manufactured by other companies does not necessarily constitute endorsement by Oki.

First edition January 1999.

SAFETY

This printer has been carefully designed to give years of safe, reliable performance. As with all electrical equipment, however, there are a few basic precautions that should be taken to avoid personal injury or damaging the printer:

- Read this user's guide carefully and save it for future reference.
- Read and follow all warning and instruction labels on the printer itself.
- Disconnect the printer before cleaning. Use only a damp cloth. Do not use liquid or aerosol cleaners to clean the printer.

- Place the printer on a firm, solid surface. If the printer is placed on something unsteady, it may fall and become damaged or injure someone. If the printer is placed on a soft surface, such as a rug, sofa, or bed, the vents may become blocked causing the printer to overheat.
- Do not put the printer on or near a heat source, such as a radiator or heat register. Keep it out of direct sunlight. Allow enough room around the printer for adequate ventilation and easy access.
- Do not use the printer near water, or spill liquid of any kind into it.
- Make sure that the power source matches the rating listed on the back of the printer. If you are not sure, check with your dealer or with your local power company.
- This printer has an earthed, 3-pin plug as a safety feature and will only connect to an earthed outlet. If this plug cannot be connected to a power outlet, then it is possible that the power outlet is of the older, non-earthed type. Contact an electrician to have the power outlet replaced. Do not use an adapter to defeat the earthing.
- To avoid damaging the power cable, do not put anything on it or place it where it will be walked on. If the cable becomes damaged or frayed, replace it immediately.
- If an extension cable or power strip is being used with the printer, make sure that the total of the amperage rating required by all the equipment is less than the rating of the extension cable or power strip. The total ratings of all equipment plugged into the outlet should not exceed 13 amperes.
- The power outlet into which the printer is connected must remain accessible at all times.
- Opening any cover may expose hot surfaces. These are clearly labelled. Do NOT touch them.
- Do not poke anything into the ventilation slots on the printer; you could get a shock or cause a fire.
- Aside from the routine maintenance described in this user's guide, do not try to service the printer yourself. Opening a cover may expose you to shocks or other hazards.
- Do not make any adjustments other than those outlined in this user's guide as damaged may be caused to the printer.

If anything happens that indicates that the printer is not working properly or has been damaged, disconnect the printer from the power source and contact your dealer. These are some of the things to look for:

- The power cable or plug is frayed or damaged.
- Liquid has been spilled into the printer, or it has been exposed to water.
- The printer has been dropped, or the cabinet is damaged.
- The printer does not function normally when following the operating instructions.

This product complies with the requirements of the Council Directives 89/336/EEC and 73/23/EEC on the approximation of the laws of the member states relating to electromagnetic compatibility and low voltage.

ENERGY STAR

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

TABLE OF CONTENTS

IBM Mode

Epson FX Mode

Appendix A - Control Code Tables

Appendix B - Character Tables

Index

Set Up

INSTALLATION

Components

The packaging should include the following components:

- Printer
- Power supply cable
- Ribbon cartridge
- Paper support
- Printer drivers on diskettes
- User's Guide

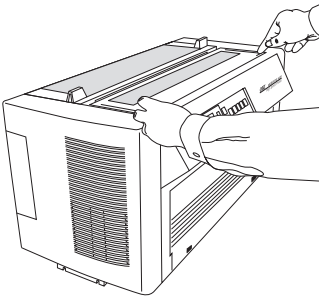
WARNING
THE PRINTER IS LARGE AND HEAVY (42 kg). IT REQUIRES TWO PEOPLE TO LIFT AND MANOUVER THE PRINTER SAFELY.

CAUTION:
The printer must be installed on a printer stand, cabinet or table that is capable of safely accepting the printer's weight and safely support the printer during operation.

Unpacking

1. Remove the printer from the carton and place it on a flat and stable surface that cand safely accept the printer's weight (42 kg).
2. When positioning the printer, make sure there is adequate room around the printer to allow for easy operation and maintenance of the printer.
3. Remove all the packaging material from around and inside the printer.

4. Open the top front cover by pressing down at each end and then lift up the cover.



5. Remove the screw securing the retainer plate to the print head and then remove this retainer plate.
6. Remove the two shipping retainers (red rubber) from each end of the platen.
7. Close the top front cover and press down at each end to lock the top cover in place.

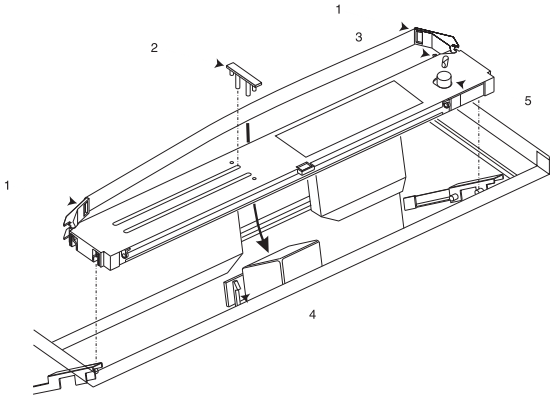
> ***Note:***
> *Save the retainer plate, shipping retainers and packaging in case you ever need to ship the printer.*

Installing Ribbon Cartridge

1. Make sure the printer is off line and the print head has moved to the gap in the platen.

> ***Note:***
> *If there is no paper installed in the printer, turn the printer off and manually move the print head to the gap in the platen before installing the ribbon cartridge.*

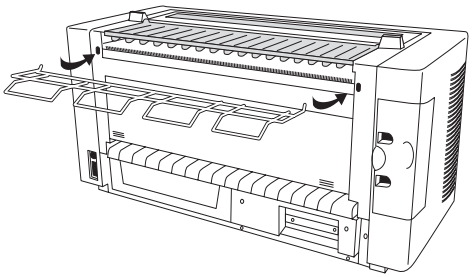
2. Switch the printer off and disconnect the power supply.
3. Open the top front cover by pressing down at each end and then lift up the cover.
4. Unpack the ribbon cartridge and open the two guide arms (1) on the cartridge.
5. Remove the ribbon retainer (2) and push in the roller arm claw (3).



6. Place the ribbon cartridge onto the mounting brackets and press down until the ribbon cartridge snaps into place.
7. Guide the ribbon over the print head making sure the ribbon is positioned in the slots on the ribbon guides (4).
8. Turn the coloured knob (5) on the ribbon cartridge in the direction of the arrows to take up any slack in the ribbon.
9. Close the top front cover and press down at each end to lock the top cover in place.

Paper Support

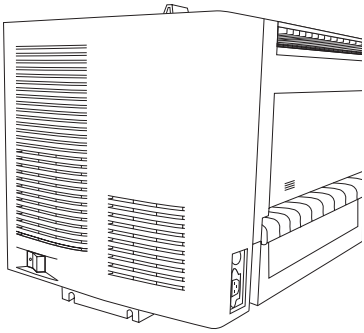
Insert the two hooked arms at an angle into the slotted holes on the rear of the printer, then move the paper support into a horizontal position to lock into place.



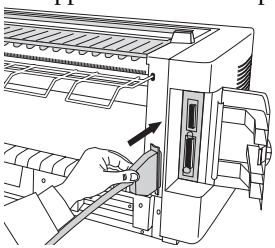
Computer & Power Connection

Note:
A printer cable is not normally supplied with the printer. It is recommended to use a shielded printer cable when connecting your printer to a computer.

1. Make sure the printer and your computer are turned off.
2. Connect the power cable into the power socket on the printer.



3. Connect the power cable into a power outlet that is earthed, easily accessible and close to the printer.
4. Open the hinged cover on the side of the printer and connect the printer cable to the applicable interface port.



Note:
The printer has two interface ports fitted as standard - parallel or serial.

5. Connect the other end of the printer cable to the applicable printer port on your computer.
6. Switch on the power supply, then switch on the printer.

PRINTER DRIVER

Before you can use your printer, a printer driver must be installed onto your computer as follows.

Windows 95/98

1. Ensure that all documents are saved and all Windows applications are closed.
2. Insert the diskette into the appropriate drive on your computer.
3. Open the Printers folder. Double click on the Add Printer item in the Printers folder to open the Add Printer Wizard.
4. Follow the instructions given by the Add Printer Wizard until the lists of manufacturers and printers appears, then click the Have Disk... button.
5. The Install From Disk dialog box appears. Make sure that the drive and location of the driver files are correct, then click on the OK button.
6. Select Oki ML4410 then click on the Next > button.
7. Follow the instructions given by the Add Printer Wizard to complete the installation of the printer.
8. For more information, see the Microsoft User's Guide for Windows 95/98, or use the online help facility.

Windows 3.1x

1. Ensure that all documents are saved and all Windows applications are closed.
2. Insert the diskette into the appropriate drive on your computer.
3. Open the Printer dialog box and click on the Add>> button.
4. Ensure Install Unlisted or Updated Printer is highlighted in the list of printers, then click OK and the Install Driver dialog box appears.
5. Make sure that the drive and location for the driver files are correct, then click the OK button. The Add Unlisted or Updated Printer dialog box appears.

6. Select Oki ML4410 and click the OK button to copy and install the printer driver files. The printer appears in the Installed Printers list in the Printers dialog box.
7. Select Oki ML4410 as the default printer by highlighting the entry in the Installed Printers list and then clicking the Set As Default Printer button.
8. Configure the driver for the proper printer port, then click on the Setup... button to configure the options for the printer.
9. Click on the Close button to close the Printers dialog box.
10. For more information, see the Microsoft User's Guide for your version of Windows, or use the online help facility in Windows.

Windows NT 4.0

1. Ensure that all documents are saved and all Windows applications are closed.
2. Insert the diskette into the appropriate drive on your computer.
3. Click Start, point to Settings and then click on Printers.
4. Click the Add Printer icon and then select My Computer. Click on Next.
5. Select the required printer port and click on Next.
6. Select the option for Have Disk and browse to the correct drive and directory.
7. Select Oki ML4410 and follow the remaining instructions to complete the installation of the printer.

PAPER

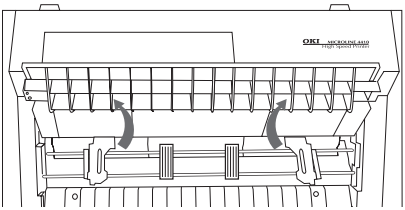
Your printer has two paper feeds; front and rear. Both of these paper feed paths have integral push tractor mechanisms with auto bail arms for use with continuous forms. Paper can be loaded onto both paper feeds at the same time. The paper path is software selectable through the printer driver or manually on the printer.

Note 1:
When using a paper width of less than 127 mm for the front feed and 102 mm for the rear feed, remove one of the paper supports from between the tractors. This is a push fit onto the supporting rods.

Note 2:
Refer to Controls & Indicators in Operation for location of the buttons mentioned below.

Front Paper Feed Loading

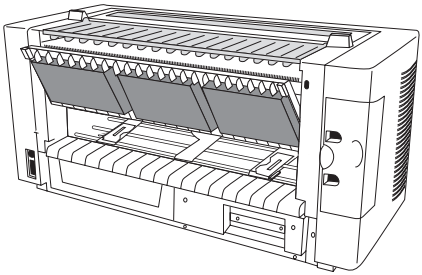
1. Open the front cover, then open the tractor covers and lift up the tractor lock levers.



2. Move the right tractor to approximately fit the width of paper being used.
3. Place the first three holes in the paper over the tractor pins at each side and close the tractor covers.
4. Move the left tractor to align the edge of the paper with the appropriate reference mark, then lock the tractor in place by pressing down the lock lever.
5. Move the right tractor to centre the paper holes on the pins and lock the tractor in place by pressing down the lock lever.
6. Select the paper feed path on the printer.
7. Press FF/LOAD button and the paper feeds into the printer from the selected paper path.

Rear Paper Feed Loading

1. Open the rear cover, then open the tractor covers and lift up the tractor lock levers.
2. Move the left tractor to approximately fit the width of paper being used.



3. Place the first three holes in the paper over the tractor pins at each side and close the tractor covers.
4. Move the right tractor to align the edge of the paper with the appropriate reference mark, then lock the tractor in place by pressing down the lock lever.
5. Move the left tractor to centre the paper holes on the pins and lock the tractor in place by pressing down the lock lever.
6. Select the paper feed path on the printer.
7. Press FF/LOAD button and the paper feeds into the printer from the selected paper path.

Changing Paper Path

Changing the paper path can be carried out from the computer using software commands in the printer driver or manually as follows:

1. Tear off any printed pages, then press ONLINE button to turn the printer off line.
2. Press the PATH button to change the paper path from front to rear or rear to front. The paper path in use automatically moves paper to the park position and then the other paper path automatically loads paper into position ready for printing.
3. Press the ONLINE button.

> ***Note:***
> *A paper path that has been manually selected on the printer will be overridden by software commands if the selected paper path in the software is different to the one selected on the printer.*

Top of Form

The top of form (TOF) is automatically set when paper is loaded. However and if required, the TOF can be manually adjusted as follows:

1. Press the ONLINE button to turn the printer off line.
2. To move the TOF up, press and hold the SHIFT button, then press the MICROFEED UP button until the paper is in the required position.
3. To move the TOF down, press and hold the SHIFT button, then press the MICROFEED DOWN button until the paper is in the required position
4. Press the ONLINE button.

PRINTER EMULATION

Your printer can use one of three emulations - Epson FX; IBM Proprinter III; Oki Microline. The default setting for emulation is IBM Proprinter, but this can be changed as follows:

1. Press the MENU button on the control panel and the LCD display changes to MENU GROUP Printer Control.

   Note:
   For further explanation of the menu system on this printer, refer to Menu Mode in Operation.

2. Press the ITEM button, then press the OPTION button until the required printer emulation is displayed.
3. Press the STORE button to select the printer emulation.

   Note:
   When printing through Windows, the printer emulation automatically changes to Epson FX. After the printing is completed, printer emulation remains set to Epson FX.

SELF TESTS

To check if your printer is working correctly, the following self tests can be run:

1. Make sure there is paper loaded into the printer.

2. Switch off the printer.
3. For the self test demo pattern, press and hold the LF button while turning the printer on. The demo pattern then starts printing.
4. To stop the test before it is complete, press the ON LINE button.
5. For the rolling ASCII test, press and hold the PATH button while turning the printer on. The rolling ASCII test then starts printing.
6. To stop the test, press the ON LINE button.
7. For the hex data dump test, press and hold the FF/LOAD button while turning the printer on. The hex data dump test allows you to diagnose problems in your program or application by printing the hexadecimal and ASCII equivalent number of the data sent to your printer.
8. To stop the test, press the ON LINE button or turn the power off.

SPECIFICATION

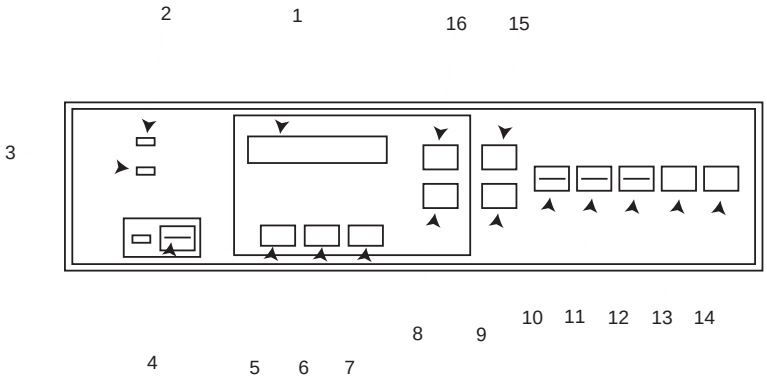
Print method	Impact dot matrix
Print head	2 rows x 9 pins in a single head configuration
Print speed	200 CPS NLQ; 800 CPS Utility; 1066 CPS HSD; 280 LPM sustained printing (136 col continuous text)
Characters per line (CPL)	10 CPI - 136 CPL; 12 CPI - 163 CPL; 15 CPI - 204 CPL; 17.1 CPI - 233 CPL; 20 CPI - 272 CPL
Emulations	Epson FX; IBM Proprinter III; Oki Microline Standard
Interface	Centronics parallel; RS232C 25 pin serial; Oki HSP network card interface (optional)
Graphics resolution	Epson/IBM - 240 (H) x 216 (V) dpi max; Oki ML - 288 (H) x 144 (V) dpi max
Resident fonts	NLQ - Courier, Gothic; Utility - Gothic; HSD - Gothic
Bar codes	Code 39; UPC A; UPC E; EAN 8; EAN 13; Interleaved 2 of 5; Code 128; Postnet
Scalable fonts	Type face - Gothic, Courier; Point range 22 to 216 points in 1 pt increments
Receive buffer size	128 K max
Reliability	Mean time between failures (MTBF) - 12 000 hours at 25% duty cycle 35% page density Mean time to repair (MTTR) - 15 minutes Printer duty cycle -35 000 pages per month at 25% duty cycle 35% page density

Paper size:	Continuous paper width 76.2 mm to 419.1 mm Labels max 381 mm x 83 mm front feed only Card max 127 mm x 203 mm front feed only Continuous envelope width 76.2 mm to 254 mm front feed only
Paper thickness:	Continuous form; rear feed 0.36 mm max; front feed 0.79 mm max Labels max 0.28 mm front feed only Card max 0.20 mm front feed only Continuous envelope max 0.36 mm front feed only
Paper specification:	Continuous form single 45 to 90 g/m^2 Continuous form carbonless 35 to 40 g/m^2 ; max 10 sheets front feed and 6 sheets rear feed including original Continuous form interleaf 34 to 52 g/m^2 ; max 7 sheets front feed and 4 sheets rear feed including original Continuous envelope max 90 g/m^2 front feed only Card max 90 g/m^2 front feed only
Dimensions:	Width 768 mm; depth 385 mm; height 358 mm
Weight:	42 kg
Environmental requirements:	
Temperature:	5 to 35 deg C operating; 0 to 43 deg C non-operating; -10 to 43 deg C storage; -40 to 70 deg C transportation
Humidity:	20 to 80 %RH operating; 10 to 90 %RH non-operating; 5 to 95 %RH storage; 5 to 95 %RH transportation
Electrical requirements:	90 to 270 V ac; 50/60 Hz +/- 2%

Operation

CONTROL PANEL

The control panel is used to program or configure the printer manually. Some of the printer functions are overridden by software commands when using the printer drivers installed in your computer.



Controls & Indicators

1 LCD Panel: Refer to this liquid crystal display (LCD) panel for information when operating the printer and programming the printer in menu mode.

2 POWER Indicator: Comes on when the printer is switched on.

3 ALARM Indicator: Comes on when there is a recoverable alarm condition; e.g. paper out, paper jam, cover open. Flashes when there is a non-recoverable alarm condition.

4 ON-LINE (RESET) Button: Switches the printer between on-line and off-line when pressed. The ON-LINE indicator comes on when the printer is on-line. When pressed in conjunction with the SHIFT button, resets the printer.

5 GROUP Button: Selects the different menu groups when the printer is in menu mode.

6 ITEM Button: Selects the different items within each menu group when the printer is in menu mode.

7 OPTION Button: Selects the different options that are available for each item when the printer is in menu mode.

8 STORE Button: Selects the option displayed on the LCD panel when programming the printer in menu mode.

9 SHIFT Button: Selects the alternative function when pressed in conjunction with the ON-LINE, PATH, FF/LOAD and LF buttons.

10 PATH (TOF) Button: Changes the paper feed path. When pressed in conjunction with the SHIFT button, sets the paper position for the top of form.

11 FF/LOAD (Microfeed Up) Button: Loads the paper when there is no paper loaded. Advances the paper to the top of the next page when there is paper loaded. When pressed in conjunction with the SHIFT button, moves the paper upward by 1/144 of an inch for fine adjustment of the paper position.

12 LF (Microfeed Down) Button: Advances the paper by one line when there is paper loaded. When pressed in conjunction with the SHIFT button, moves the paper downward by 1/144 of an inch for fine adjustment of the paper position.

13 TEAR Button: Advances the paper to the tear off position when pressed.

14 PARK Button: Moves the loaded paper to the park position when pressed.

15 CONFIG Button: Two different configurations can be programmed into the printer. When pressed, this button switches the printer between CFG1 and CFG2.

16 MENU Button: Switches the printer into menu mode when pressed. Menu mode is cancelled by pressing the MENU button again or pressing the ON-LINE button.

MENU MODE

Menu Mode for the printer is used to set the various options and features that are available on the printer.

> ***Note:***
> *Some options and features set on the printer through Menu Mode can be overrriden by software commands from a printer driver if the selected option or feature in the software is different to the one selected on the printer.*

Using Menu Mode

1. Press the MENU button or GROUP button to turn the printer off-line, then keep pressing the GROUP button until the required menu group is displayed.
2. Keep pressing the ITEM button until the required menu item is displayed.
3. Keep pressing the OPTION button until the required option is displayed.
4. Press the STORE button to select the required option. The selected option is indicated with an asterisk (*).
5. Press the ITEM button or GROUP button to continue to set options and features of the printer or press the ON-LINE button to turn the printer back on-line.

Summary of Menu Items

> ***Note:***
> *Items in italics are the default settings.*

Group	Item	Setting
Printer Control	Emulation Mode	*IBM-PPR*; EPS-FX; OKI-ML
Font	Print Mode	*Utility*; NLQ Courier; NLQ Gothic; HSD
	Pitch	*10 CPI*; 12 CPI; 15 CPI; 17.1 CPI; 20 CPI
	Proportional Spacing	*No*; Yes
	Style	*Normal*; Italics
	Size	*Single*; Double
Symbol Sets	Character Set	Epson/IBM - *Set II*; Set I Oki ML - Standard; Line graphics; Block graphics

Group	Item	Setting
	Language Set	*ASCII*; French; German; British; Danish I; Swedish; Italian; Spanish I; Japanese; Norwegian; Danish II; Spanish II; Latin American; French Canadian; Dutch; TRS 80; Swedish II; Swedish III; Swedish IV; Turkish; Swiss I; Swiss II; Publisher
	Zero Character	*Unslashed*; Slashed
	Code Page	*USA*; Canada French; Multilingual; Portugal; Norway; Turkey; Greek 437; Greek 869; Greek 928; Grk 437 Cyprus; Polska Mazovia; Serbo Croatic I; Serbo Croatic II; ECMA-94; Hungarian CWI; Windows Greek; Windows CEE; Windows Cyrillic; CEE L II-852; Cyrillic I-855; Cyrillic II-866; Kamenicky (MJK); ISO Latin 2; Hebrew NC (862); Hebrew OC; Turkey 857; Win Tky Latin 5; Windows Hebrew; Ukrainian; Bulgarian; Latin 6 8859/10; Windows Baltic; Baltic 774; KBL-Lithuanian; Cyrillic Latvia; Roman-8; Icelandic-861;
	Slashed O	*No*; Yes
Rear Feed	Line Spacing	*6 LPI*; 8 LPI
	Form Tear-off	*Off*; 500 ms; 1 sec; 2 sec
	Skip Over Perf.	*No*; Yes
	Page Width	*13.6"*; 8"
	Page Length	*12"*; 14"; 17"; 3"; 3.5"; 4"; 5"; 5.5"; 6"; 7"; 8"; 8.5"; 11"; 11 2/3"
Front Feed	Line Spacing	*6 LPI*; 8 LPI
	Form Tear-off	*Off*; 500 ms; 1 sec; 2 sec
	Skip Over Perf.	*No*; Yes
	Page Width	*13.6"*; 8"
	Page Length	*12"*; 14"; 17"; 3"; 3.5"; 4"; 5"; 5.5"; 6"; 7"; 8"; 8.5"; 11"; 11 2/3"
Set-Up	Graphics	*Bi-directional*; Uni-directional
	# Graphics (Oki mode only)	*7*; 8
	Rcv. Buffer	*16K*; 28K; 56K; 1 Line
	Ppr Out Override	*No*; Yes
	Registration 1 Registration 2 Registration 3 Registration 4 Registration 5 Registration 6 Registration 7	*0.05 mm Left*; 0.10 mm Left; 0.15 mm Left; 0.20 mm Left; 0.25 mm Left; 0.25 mm Right; 0.20 mm Right; 0.15 mm Right; 0.10 mm Right; 0.05 mm Right; 0
	Data Word Size (Oki mode only)	*8*; 7
	OP. Panel Func.	*Full Operation*; Limit Operation

Group	Item	Setting
	Reset Inhibit	*No*; Yes
	Print Suppress	*Yes*; No
	Auto LF	*No*; Yes
	Auto CR (IBM mode only)	*No*; Yes
	Print DEL Code (Oki mode only)	*No*; Yes
	SI Pitch (10) (IBM mode only)	*17.1 CPI*; 15 CPI
	SI Pitch (12) (IBM mode only)	*12 CPI*; 20 CPI
	Time Out Print	*Valid*; Invalid
	Auto Select	*No*; Yes
	ESC SI Pitch (IBM mode only)	*17.1 CPI*; 20 CPI
	Intr Chr Sub st (Epson mode only)	*Combined*; Code Page Only
	Host Interface	*Auto Interface*; Parallel; Serial; Oki HSP (only when MUPIS card is fitted)
	I/F Time Out	*15 sec*; 30 sec; 45 sec; 1 min; 2 min; 3 min; 4 min; 5 min
	Default Path	*Current Path*; Rear Path; Front Path
	Auto Path	*Invalid*; Valid
	Impact Mode	*Normal*; Quiet; Hi-Copy
	LF Speed	*Fast*; Slow
	Width Control	*Invalid*; Mode 1; Mode 2
Parallel I/F	I-Prime	*Buffer Print*; Buffer Clear; Invalid
	Pin 18	*+5v*; Open
	Auto Feed XT (Epson mode only)	*Invalid*; Valid
	Bi-Direction	*Disable*; Enable
Serial I/F	Parity	*None*; Odd; Even
	# Serial Bits	*8 Bits*; 7 Bits
	Protocol	*Read/Busy*; X-ON/X-OFF
	Diagnostic Test	*No*; Yes
	Busy Line	*SSD-*; SSD+; DTR; RTS
	Baud Rate	*9600 BPS*; 4800 BPS; 2400 BPS; 1200 BPS; 600 BPS; 300 BPS; 19200 BPS; 38400 BPS
	DSR Signal	*Valid*; Invalid
	DTR Signal	*Rdy on Pwr Up*; Ready on Select
	Busy Time	*200 ms*; 1 sec
OKI HSP		Only when MUPIS card is fitted and depends on which MUPIS card is fitted.

Explanation of Menu Items

General

 # Graphics Bits: Oki mode only - choose the graphics your system uses, either 7 or 8 bit data.

Auto CR: IBM mode only - if you want the printer to automatically add a carriage return when a line feed is received at the end of a line, change the setting to yes.

Auto LF: Automatically adds a line feed to each carriage return command the printer receives. If your printout is consistently double spaced, select no. If your printout consistently overprints, select yes.

Auto Path: When set to valid, automatically feeds paper from the unused paper path when paper end is detected and continuous printing is required.

Auto Select: If you always use the same top of form position, change the setting to yes.

Character Set: Select which character set the printer uses as default when printing.

Code Page: Choose the code page for the character set you wish to use.

Data Word Size: Oki mode only - if your computer system uses seven bits to make up each unit of data, change this setting to 7.

Default Path: Sets which paper path is used during printer initialisation. Current path sets the paper path to the paper path in use when the printer was switched off. Rear path always sets to the printer to use the rear path on initialisation. Front path always sets to the printer to use the front path on initialisation.

Emulation Mode: Choose the emulation mode you want to use for your printer. IBM Proprinter, Epson FX or Oki Microline.

ESC SI Pitch: IBM mode only - sets details of the ESC SI command. 17.1 CPI sets ESC SI to condensed mode and 20 CPI sets ESC SI to to 20 CPI setting.

Form Tear-Off: Choose 500 ms, 1 sec, or 2 sec to turn this feature on and to set the time interval for the printer to wait before advancing the paper to the tear-off position.

Graphics: Default setting is bidirectional for faster printing of graphics. Unidirection (left to right only) gives a better graphics print registration at

a slower speed. Graphics printing can also be optimised by adjusting the registration of the print head.

Host Interface: Selects which interface the printer uses to receive printing commands. Auto setting - the printer automatically switches interface depending on the received data. Parallel setting - where only a parallel interface is used. Serial setting - where only a serial interface is used.

I/F Time Out: Sets the length of time before the interface switches to idle status when no printing commands have been received.

Impact Mode: Selects the impact mode used when printing. The settings are normal mode, quiet mode for low noise printing and hi-copy mode when printing using multiple copies.

Intr Chr Sub St: Epson mode only - enables or disables the code page settings and switches to allow for foreign language conversion and combination.

Language Set: Changing the language set replaces certain standard symbols with special characters used in foreign languages.

LF Speed: Selects the line feed speed - fast or slow.

Line Spacing: Select 8 LPI to print more lines on a page.

OP Func.: Changes the operator panel to limited operation. This prevents any special printer settings from being changed via the control panel when several people are using the printer.

Page Length: Set this to match the length of the paper you are using enabling the printer to keep track of the initial printing position of each page (TOF).

Page Width: Change to 8" to print on letter size paper.

Pitch: Choose the character width in characters per inch (CPI).

Ppr Out Override: Senses when less than 25 mm of paper remains and stops printing. Change to yes to override the sensor. Please note that changing this setting to yes can cause loss of data and damage the print head.

Print DEL Code: Oki mode only - change the setting to Yes if you want to print the DEL code (decimal 27) as a solid box.

Print Mode: Choose the quality and font for printing.

Print Suppress: If your system uses the DC1 and DC3 codes for something other than the print suppress mode, change the setting to no.

Prop. Spacing: Change the setting to yes if you want to use proportional spacing of characters when printing.

Rcv. Buffer: Sets the amount of printer memory for holding received data. Selecting a larger size allows large jobs to be sent to the printer and reduces the time the computer is busy sending data to the printer. If the computer has problems with device time-outs, select a smaller buffer size.

Registration 1 to 7: Change the settings as required to obtain the best registration for bidirectional printing. Normally 0 is the best setting, but choosing another value may compensate for registration problems with some graphis software packages.

Reset Inhibit: Select yes if your software package or computer sends an initialisation command at the start of each print job. This initialisation command normally resets any features that have been set on the printer.

SI Pitch (10): IBM mode only - sets the pitch to be engaged when the printer control panel is set for 10 CPI and the SI command is received.

SI Pitch (12): IBM mode only - sets the pitch to be engaged when the printer control panel is set for 12 CPI and the SI command is received.

Size: Change to double for double width and height printing.

Skip Over Perf.: Change to yes if you want the printer to go to the next page when it comes within 25 mm of the bottom of the page. Set to no if your software has its own page formatting controls.

Slashed Letter O: If set to yes, a slashed capital Ø and lower case ø appear at locations 9Bh and 9Dh respectively in USA code page. If set to no, the characters ¢ and ¥ appear at these locations.

Style: Change to italics if you want the printed characters to be slanted.

Time Out Print: If your software spends a long time processing between portions of data it feeds to the printer, change the setting invalid to keep your printer from inadvertently dumping any received data in the buffer while it is waiting to receive more data.

Zero Character: Select slashed when it is necessary to distinguish between a zero (0) and a capital or upper cae O.

Parallel Interface

The following options are used when the parallel interface is selected.

Auto Feed XT: Epson mode only - if your system uses pin 14 of the parallel interface to control automatic line feed, change the setting to valid.

Bi-Direction: Change to disable if you want the printer to print in one direction only.

I-Prime: Determines what the printer does when it receives the I-Prime signal from the host. Buffer print prints out the buffer contents before resetting, buffer clear dumps the buffer contents immediately and invalid causes the printer to ignore the I-Prime signal.

Pin 18: Sets the signal on pin 18 to +5 volts or to open as required by an external device when connected to the interface.

Serial Interface

The following options are used when the serial interface is selected.

#Serial Bits: Selects data format.

Baud Rate: Selects the parity of the interface.

Busy Line: Selects the line used for the busy signal.

Busy Time: Sets the busy signal timing.

Diagnostic Test: Activates the interface diagnostic test for the printer.

DSR Signal: Sets the data set ready (DSR) signal.

DTR Signal: Selects data terminal ready (DTR) signal status.

Parity: Selects paity if the interface - none, odd or even.

Protocol: Selects interface protocol.

MAINTENANCE

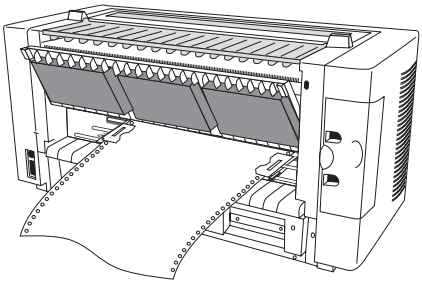
Replacing Ribbon Cartridge

1. Turn the printer off line by pressing the ONLINE button and make sure the print head moves to the gap in the platen.
2. Turn the printer OFF.
3. Remove and discard the used ribbon cartridge.
4. Install the new ribbon cartridge. Refer to Installing Ribbon Cartridge in Set Up.

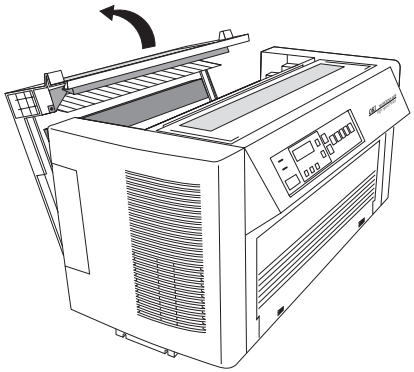
Clearing Paper Jams

Rear Feed

1. Turn the printer OFF.
2. Open the rear access cover and remove the paper from the rear tractors.



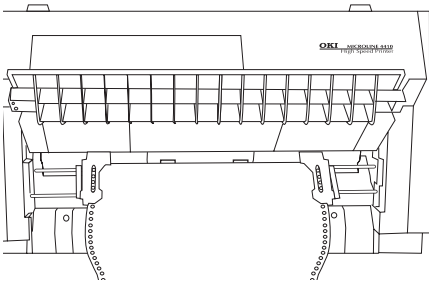
3. Open the rear of the printer and make sure any pieces of paper are removed from inside of the printer.



4. Close the rear of the printer.
5. Load continuous paper onto the rear paper feed. Refer to Rear Paper Feed Loading in Set Up.

Front Feed

1. Turn the printer OFF.
2. Open the front access cover and remove the paper from the front tractors.



3. Open the rear of the printer, as shown above, and make sure any pieces of paper are removed from inside of the printer.
4. Close the rear of the printer.
5. Load continuous paper onto the front paper feed. Refer to Front Paper Feed Loading in Set Up.

Cleaning

The printer should be cleaned every six months or after approximately 300 hours of operation.

Caution
Never use solvents or strong detergents on the printer housing as these could cause damage to the printer housing.

---

1. Turn the printer off and remove the paper from the front and rear paper feeds.
2. Open all access covers and, using a clean dry cloth, dust around inside the printer removing any loose pieces of paper.
3. Reload continuous paper onto the front and rear paper feeds.
4. Close all access covers and turn the printer on.

TROUBLESHOOTING

Problem	Solution
Nothing happens when the printer is turned on.	Check power cable connection and power outlet for your printer. If you are using an extension lead or power strip, make sure it is turned on and connected to the power supply. Also check that the fuse has not blown nor the circuit breaker tripped.
The printer does not print when data is sent.	Is the ONLINE indicator on. If not, press the ONLINE button. Check that the printer interface cable is securely connected to the printer and the computer.
Strange symbols, incorrect fonts, etc. are printed.	Check the printer driver selected matches the printer and the selected printer emulation. Check that any embedded printer commands have been entered correctly.
ALARM indicator is on.	Refer to Recoverable Alarms below.
ALARM indicator is flashing red.	Switch off and then back on. If this does not clear the alarm, contact the manufacturer.

ALARMS/ERROR MESSAGES

Recoverable Alarms

If the Alarm indicator comes on and the first line in the LCD panel displays OFFLINE, the printer has a recoverable alarm or error. The second line of the LCD panel displays what alarm or error has occurred with the printer, which are as follows:

Alarm	Solution
Cover Open The top access cover is open.	Close the top access cover and the printer goes to the off line state. Press the ONLINE button to turn the printer back on line and ready for printing. If the printer was printing when the Cover Open alarm came on, the Data Remain alarm comes on when the top access cover is closed.
Data Remain Indicates that there is data remaining in the printer buffer after a Cover Open alarm.	Press the ONLINE button to cancel the alarm and turn the printer back on line. The printer continues to print.
Paper End Indicates that there is no paper loaded on the selected path.	Load more continuous form paper. After loading paper (refer to Paper in Chapter 1) the alarm is cancelled.
Load Jam This alarm comes on if the TOF sensor has not detected the paper after Auto Load has been carried out.	Remove any paper causing the jam and make sure the paper is loaded correctly. Press the ONLINE button to cancel and clear the alarm.

Alarm	Solution
Eject Jam The tractor sensor cannot detect the bottom edge of the paper after Paper Eject has been carried out.	Make sure the paper has ejected correctly. Press the ONLINE button to cancel and clear the alarm.
Park Jam The tractor sensor cannot detect the bottom edge of the paper after Paper Park has been carried out.	Make sure the paper has parked correctly. Press the ONLINE button to cancel and clear the alarm.
Feed Jam Indicates that the paper has been fed incorrectly during paper loading or printing.	Remove any paper causing the jam and make sure the paper is loaded correctly. Press the ONLINE button to cancel and clear the alarm.
Ribbon Jam Indicates that the ribbon is not feeding correctly during printing.	Make sure the ribbon is installed correctly (refer to Installing ribbon Cartridge in Chapter 1). Press the ONLINE button to cancel and clear the alarm.
Path Change Jam Indicates that paper parking has not operated correctly when carrying out a paper path change.	Make sure the paper has not jammed. Press the ONLINE button to cancel and clear the alarm. Paper parking is then completed by the printer.
Paper Jam Indicates that the paper has been fed incorrectly during paper loading or printing causing the paper to jam.	Remove any paper causing the jam and make sure the paper is loaded correctly. Press the ONLINE button to cancel and clear the alarm.
Head Thermal Indicates that the temperature of the print head is high.	The printer pauses between the printing of lines until the temperature level drops and the alarm automatically clears. If the temperature of the print head is very high, the printer may stop printing until the temperature level has dropped and the alarm automatically clears.
SP Thermal Indicates that the temperature of the space motor is high.	The printer pauses between the printing of lines until the temperature level drops and the alarm automatically clears.

Non-Recoverable Alarms

If the Alarm indicator flashes red and the first line in the LCD panel displays ERROR, the printer has a non-recoverable alarm or error. The second line of the LCD displays what alarm or error has occurred with the printer, which are as follows:

D-RAM	S-RAM
PROGRAM-ROM	CG-ROM
EEPROM	WDT
INVALID IPT	SPACING
HOMING	FUSE
HEAD THERMISTOR	AUTO GAP

PATH CHANGE	CENTERING
POWER FAN	HEAD 1 FAN
HEAD 2 FAN	SPACE FAN
MAIN LSI	BAIL
RIBBON	OPTICAL SENSOR
LCD TIME OUT	OPT CARD ROM
OPT CARD RAM	OPT CARD CONNECT
OKI HSP CONNECT	

If a non-recoverable alarm or error occurs, switch the printer off and then back on. If this does not clear the alarm or error, contact the dealer or manufacturer for technical support.

IBM Mode

The following two sections explain all the available features that can be changed, starting in this section with the features for IBM mode (Proprinter compatibility) and followed by the features available for Epson FX mode in the following section.

Some of these commands are applicable to both IBM mode and Epson FX mode and the following table lists the common commands:

Features	Command
Double width	SO/DC4/ESC W
Emphasised	ESC E/F
Enhanced	ESC G/H
Super/subscripts	ESC S/T
Underlining	ESC -
Form length	ESC C
FF	FF
6/8 LPI	ESC 2/0
Line spacing	ESC A/J/3
Skip over perforation	ESC O/N
HTABS	HT/ESC D
VTABS	ESC B/VT
CR	CR
LF	LF
Paper out on/off	ESC 8/9
Clear buffer	CAN
Uni/bidirectional printing	ESC U
Unidirectional (1 line)	ESC <
Backspace	BS
Print suppress off	DC1
Cut Sheet Feeder	ESC EM I/R/1/2
Graphics	ESC K/L/Y/Z
15CPI	ESC g

Against each feature, one of the following letters indicates in which mode the command works:

P Commands work in the Proprinter mode.
F Commands work in the Epson FX mode.

A complete summary of all the control codes that are available in each mode can be found in Appendix A.

CHARACTERS PER INCH

The numbers of characters per inch (CPI) defines how many letters, numbers or symbols can be printed in one inch. The printer has 5 normal character sizes:

10 CPI	12 CPI	15 CPI
17.1 CPI	20 CPI	

and 5 expanded or double-width counterparts:

5 CPI	(double 10 CPI)
6 CPI	(double 12 CPI)
7.5 CPI	(double 15 CPI)
8.5 CPI	(double 17.1 CPI)
10 CPI	(double 20 CPI)

The double-width command expands the characters so that fewer characters fit in an inch. If text is to be separated into topics, this feature is ideal for printing headings for each topic.

Although the default setting is 10 CPI, the character pitch can be changed by entering the following printer control codes for normal characters:

Character Pitch	Decimal	Hex.	ASCII	Comp.
10 CPI	18	12	DC2	P
12 CPI	27 58	1B 3A	ESC :	P
17.1 or 20 CPI	15	0F	SI	P
15 CPI	27 103	1B 67	ESC g	P F

and for double width characters:

Double Width	Decimal	Hex.	ASCII	Comp.
Begin double width printing for one line	14	0E	SO	P F
Cancel double width printing for one line	20	14	DC4	P F
Begin double width printing (not cancelled by end of line)	27 87 49	1B 57 31	ESC W 1	P F
Cancel double width printing	27 87 48	1B 57 30	ESC W 0	P F

Note:
Double width printing in 10 CPI and 12 CPI can be combined with NLQ, emphasised, and enhanced printing. The ESC W 1 command takes priority over the SO command.

Double Height and/or Double Width	Decimal	Hex.	ASCII	Comp.
Begin double height and/or double width printing	27 91 64 n1 n2 m1...m4	1B 5B 40 n1 n2 m1...m4	ESC [@ n1 n2 m1...m4	P

This command is only for the Proprinter mode and sets either double height, double width or both, together with the control of line spacing. The following table will help you choose the correct command for your requirements.

n1 and n2 are the number of bytes in the sequence. Normally this will be four so n1 = 4 and n2 = 0.

m1 to m4 are the modes available. m1 and m2 are ignored and are therefore constantly set at 0. m3 defines character height and line feed value. m4 defines character width.

Selecting m3

m3	Function
0	No Change
1	LF Unchanged standard height characters
2	LF Unchanged double height characters
16	Single LF/ character height unchanged
17	Single LF/ standard height characters
18	Single LF/ double height characters
32	Double LF/ character height unchanged
33	Double LF/ standard height characters
34	Double LF/ double height characters

m4 specifies either standard or double width characters as below:

m4 = 0 No change
m4 = 1 Standard
m4 = 2 Double Width Chr.

Only m3 and m4 have to be selected according to the desired function. The complete ESC sequence is:

```
CHR$(27);"[@";CHR$(4);CHR$(0);CHR$(0);CHR$(0);
CHR$(m3);CHR$(m4)
```

For some applications, it is necessary to know how many characters fit in one line. This depends on both the characters per inch and the paper width.

The following table shows the maximum number of characters per line for each character pitch.

Character Size	Max No
10 CPI CHR$(18)	136
12 CPI CHR$(27);CHR$(58)	163
15 CPI CHR$(27);CHR$(103)	204
17.1 CPI	233
20 CPI CHR$(15)	272
5 CPI CHR$(18);CHR$(14)	68
6 CPI CHR$(27);CHR$(58);CHR$(14)	81
7.5 CPI CHR$(27);CHR$(103);CHR$(14)	102
8.5 CPI CHR$(18);CHR$(15);CHR$(14)	116
10 CPI CHR$(27);CHR$(58);CHR$(15);CHR$(14)	136

IBM BASIC will not normally allow printing of more than 80 characters on a line. Enter a WIDTH statement to supersede this limitation.

PRINT MODES

Near Letter Quality, Utility, High Speed Draft & Italics

The default setting of the printer when switched is utility mode. In this mode the printer prints bidirectionally: that is, printing one line from left to right, the next line from right to left, etc. This printing method increases the printer's speed so it prints 800 characters per second. This mode is used for high-volume printing and printing program listings or rough drafts.

If a little print quality can be sacrificed for speed, select high speed draft (HSD) mode. In this print mode, the printer prints at 1066 cps in 10 CPI. However, draft mode is unavailable for printing using double width, emphasised, enhanced, italics or proportional spacing.

Where good quality printing is required, use near letter quality mode (NLQ). In this mode the printer prints at a slower rate of 200 characters per second because it prints each line twice. On the second pass, the printer fills in between the dot pattern printed on the first pass to form a sharp, crisp letter.

To highlight paragraphs or keywords, the printer can also be set to print in *italics*.

The following table is a summary of the commands that need to be entered.

Print Mode	Decimal	Hex	ASCII	Comp
High Speed Draft Mode (HSD)	27 35 48	1B 23 30	ESC # 0	P
Begin Italics Printing	27 37 71	1B 25 47	ESC % G	P
Stop Italics Printing	27 37 72	1B 25 48	ESC % H	P
Near Letter Quality Mode (NLQ)	27 71	1B 47	ESC G	F P
Select NLQ Gothic	27 73 50	1B 49 32	ESC I 2	P
Select NLQ Courier	27 73 51	1B 49 30	ESC I 0	P
Exit NLQ	27 72	1B 48	ESC H	F P
Note: Clearance between NLQ characters is variable.				

Proportional Spacing

Proportional spacing gives a document a typeset look by adjusting the spacing between characters according to the width of a character, e.g. an “i” would need less space than a “w” would. The proportional spacing command can be given anywhere on a line.

Proportional Spacing	Decimal	Hex.	ASCII	Comp.
Proportional spacing on	27 80 49	1B 50 31	ESC P 1	P
Proportional spacing off	27 80 48	1B 50 30	ESC P 0	P

Spacing Between Characters

Some software packages allow individual character widths and the spacing between individual characters to be specified. Together, by varying the spacing between characters in proportion to their width, these features produce a more polished, typeset look. If this option is available, it can be modified by entering the control codes explained below. Follow the software package's instructions on modifying it.

When the printer is turned on, its standard character spacing is 3/120 inch (0.64 mm) at 10 CPI and 3/144 inch (0.53 mm) at 12 CPI. The control code described below allows an increase in spacing to a maximum of 14/120 inch (2.96 mm) and 14/144 inch (2.47 mm).

Spacing Between Characters	Decimal	Hex.	ASCII	Comp.
Change spacing between characters	27 86 n	1B 56 n	ESC V n	P
Return to standard spacing	27 86 0	1B 56 00	ESC V NUL	P

Note:
This command is ignored when the printer is in bit-image blocks, or line graphics mode.

The final number "n" in this code is any number between 1 and 11. This allows up to 11 dot spaces to be inserted between each character. Normally, a printer puts three dot spaces between each character. If character spacing is to be used with proportional spacing, proportional spacing has to be specified.

This command increases spacing between characters in multiples of:

1/120 inch (0.21 mm, 10 CPI)
1/144 inch (0.18 mm, 12 CPI),
1/180 inch (0.14 mm, 15 CPI)
1/206 inch (0.12 mm, 17.1 CPI)
1/240 inch (0.11 mm, 20 CPI).

The maximum variable number is 11, so the maximum possible space between characters is:

14/120 inch (2.96 mm) at 10 CPI
14/144 inch (2.47 mm) at 12 CPI

After setting the spacing, it stays in effect until the printer is turned off, the setting is changed, or standard spacing is selected.

CHARACTER SETS

In IBM emulation mode, the printer allows selection between two IBM character sets and numerous international character sets.

IBM Character Sets

IBM Character Set 1 repeats many of the non-printable commands (such as ESC and NUL) at the higher end of the ASCII scale, at decimal locations 128 through 155. The ESC command, for example, can be given as either decimal value CHR$(27) or CHR$(155). In IBM Character Set 2, the high ASCII values are reserved for characters used in foreign languages. Both these character sets have line graphics characters and mathematical symbols at decimal locations 160 through 255 on the ASCII chart. IBM Character Set 2 also includes special characters in decimal locations 3 through 6: a heart, diamond, club and spade. The section on non-ASCII characters explains how to print these special characters. Appendix B shows the two IBM character sets.

Character Sets	Decimal	Hex.	ASCII	Comp.
Select character set 1	27 55	1B 37	ESC 7	P
Select character set 2	27 54	1B 36	ESC 6	P

Code Page

This allows the user to select a Code Page, which is then available as IBM Character Sets 1, 2 and the All Character Set (in IBM emulation). The characters are accessed in the same way, using the commands ESC 7 to select Character Set 1, ESC 6 to select Character Set 2 and ESC ^ or ESC \ n1 n2 to select the All Character Set. The Code Pages can be found in Appendix B.

IBM Code Page Selection

This command selects the IBM code page, IBM PPR only, defined by the ID number.

IBM Code Page	Decimal	Hex.	ASCII	Comp.
IBM Code Page	27 91 84 n n2 0 0 m1 m2 0	1B 5B 54 n1 n2 00 00 m1 m2 00	ESC [T n1 n2 NUL NUL m1 m2 NUL	P

Note:
When Code Pages are selected, slashed zero can be selected by the menu.

These commands allow selection of character sets that replace some less frequently used characters with symbols used in a variety of European languages.

n1 and n2 are the number of bytes in the sequence. Normally this will be five, so n1=5 and n2=0.

To select code pages in IBM emulation, take the IBM ID number and divide it by 256. Assign this number to m1 and the remainder to m2. To specify code page 850 use the following BASIC statement:

```
LPRINT CHR$ (27): "[T"; CHR$ (5); CHR$(0); CHR$ (0);
CHR$ (0); CHR$ (3); CHR$ (82); CHR$ (0);
```

IBM Code Page ID Number Assignment

ID	Hex No	Code Page
437	1B5H	USA
774	306H	Baltic 774
850	352H	Multilingual
852	354H	East Europe Latin 2-852
855	357H	Cyrillic 1-855
857	359H	Turkey 857
860	35CH	Portugal
861	35DH	Icelandic 861
863	35FH	French-Canadian
865	361H	Norway
866	362H	Cyrillic 2-866
869	365H	Greek-869
895	37FH	Kamenicky (MJK)
1008	3F0H	Greek-437
1009	3F1H	Greek-928
1010	3F2H	Greek-851
1011	3F3H	Greek 437 Cyprus
1012	3F4H	Turkey
1013	3F5H	Cyrillic
1014	3F6H	Polska Mazovia
1015	3F7H	ISO Latin 2
1016	3F8H	Serbo Croatic 1
1017	3F9H	Serbo Croatic 2
1018	3FAH	ECMA 94
1019	3FBH	Windows East Europe CEE
1020	3FCH	Windows Greek
1021	3FDH	Latin 5 (Windows Turkey)
1022	3FEH	Windows Cyrillic
1023	3FFH	(reserved for Windows ANSI)
1024	400H	Hungarian CWI
1027	403H	Ukrainian
1028	404H	Roman 8
1029	405H	ISO Latin 6 (8859/10)
1030	406H	Hebrew NC
1031	407H	Hebrew OC
1032	408H	Windows Hebrew
1033	409H	KBL Lithuanian
1034	40AH	Windows Baltic
1035	40BH	Cyrillic Latvian
1072	430H	Bulgarian

Character Set	Character Set Codes		
	Decimal	Hex	ASCII
ASCII (Ø)	64	40	@
ASCII (0)	65	41	A
BRITISH	66	42	B
GERMAN	67	43	C
FRENCH	68	44	D
SWEDISH I	69	45	E
DANISH	70	46	F
NORWEGIAN	71	47	G
DUTCH	72	48	H
ITALIAN	73	49	I
FRENCH-CANADIAN	74	4A	J
SPANISH	75	4B	K
SWEDISH II	76	4C	L
SWEDISH III	77	4D	M
SWEDISH IV	78	4E	N
TURKISH	79	4F	O
SWISS I	80	50	P
SWISS II	81	51	Q
PUBLISHER	90	5A	Z

International Character Sets

With programming commands or menu selection, special characters used in a specific language can be accessed. These languages include English (with British or American symbols), German, French, Swedish, Danish, Norwegian, Dutch, Italian, French-Canadian, Spanish and Publisher. When selecting a language, some of the standard keyboard characters are replaced by new symbols. For example, when using the British character set and pressing the # key, a Pound Sterling symbol £ appears. Although the # symbol still appears on the screen, the printer prints the Pound Sterling symbol £ in its place.

International Character Sets	Decimal	Hex.	ASCII	Comp.
Select international character set	27 33 n	1B 21 n	ESC ! n	P
where n is the code for the character shown in the table				

The characters that change from language to language are shown in the following table.

ESC! n	Language	Decimal Value																	
		35	36	38	48	64	79	91	92	93	94	95	96	105	123	124	125	126
@	ASCII (Ø)	#	$	&	Ø	@	O	[	\	]	^	_	`	i	{	|	}	~
A	ASCII (0)	#	$	&	0	@	O	[	\	]	^	_	`	i	{	|	}	~
B	British	£	$	&	0	@	O	[	\	]	^	_	`	i	{	|	}	~
C	German	#	$	&	0	§	O	A	O	U	^	_	`	i	a	o	u	ß
D	French	£	$	&	0	à	O	•	ç	§	^	_	`	i	é	ù	è	¨
E	Swedish I	#	¤	&	0	É	O	Ä	Ö	Å	Ü	_	é	i	ä	ö	å	ü
F	Danish	#	$	&	0	@	O	Æ	Ø	Å	Ü	_	`	i	æ	ø	å	ü
G	Norwegian	#	$	&	0	@	O	Æ	Ø	Å	^	_	•	i	æ	ø	å	~
H	Dutch	£	$	&	0	@	O	[	IJ	]	^	_	`	i	{	ij	}	~
I	Italian	£	$	&	0	§	O	°	ç	é	^	_	ù	i	à	ò	è	ì
J	French Canadian	ü	$	ë	0	à	Ø	á	ç	ê	î	ï	ô	i	é	ù	è	û
K	Spanish	!	$	&	0	¡	O	Ñ	ñ	¿	ü	_	á	i	é	í	ó	ú
L	Swedish II	#	$	&	0	É	O	Ä	Ö	Å	Ü	_	é	i	ä	ö	å	ü
M	Swedish III	§	$	&	0	É	O	Ä	Ö	Å	Ü	_	é	i	ä	ö	å	ü
N	Swedish IV	§	¤	&	0	É	O	Ä	Ö	Å	^	_	é	i	ä	ö	å	ü
O	Turkish	ş	$	ğ	0	Ş	O	i	ö	ü	Ğ	_	ç	i	Í	ö	ü	Ç
P	Swiss I	£	$	&	0	ç	O	à	é	è	^	_	`	i	ä	ö	ü	"
Q	Swiss II	£	$	&	0	§	O	à	ç	è	^	_	`	i	ä	ö	ü	é
Z	Legal/ Publisher	#	$	&	0	§	O	°	´	¨	¶	±	`	i	©		†	™

Enhanced & Emphasised Printing

These print styles text to be highlighted with bold characters. In both emphasised and enhanced printing, the printer prints over the same text twice. The second pass is offset by a half-dot horizontally in emphasised printing and by a half-dot vertically in enhanced printing. Enhanced mode is not available in NLQ mode, but emphasised may be used.

Enhanced/Emphasised Printing	Decimal	Hex.	ASCII	Comp
Start emphasised printing (horizontal offset)	27 69	1B 45	ESC E	P F
Stop emphasised printing	27 70	1B 46	ESC F	P F
Start enhanced printing (vertical offset)	27 71	1B 47	ESC G	P F
Stop enhanced printing	27 72	1B 48	ESC H	P F

Superscripts & Subscripts

With this feature characters are printed slightly above the print line for superscripts and slightly below the line for subscripts. Superscripts and subscripts are half the width and height of standard characters at 10 CPI

and 12 CPI, and half the height of standard characters at 15 CPI, 17.1 CPI or 20 CPI.

Superscripts & Subscripts	Decimal	Hex.	ASCII	Comp.
Start superscripts	27 83 48	1B 53 30	ESC S 0	P F
Start subscripts	27 83 49	1B 53 31	ESC S 1	P F
Stop super/subscripts	27 84	1B 54	ESC T	P F

Underlining

With this feature an unbroken line is printed under characters and the spaces between characters.

Underlining	Decimal	Hex.	ASCII	Comp.
Start continuous underlining	27 45 49	1B 2D 31	ESC - 1	P F
Stop underlining	27 45 48	1B 2D 30	ESC - 0	P F

Note:
The underline feature prints a line which overlaps the end of the tails on descending characters (that is p, g, etc.). This feature will not operate in the High Speed Draft (HSD) mode.

Over Scoring

The over score command causes a line to be drawn above the designated characters. Spaces specified by the horizontal tab command will not be over scored.

Over Scoring	Decimal	Hex.	ASCII	Comp.
Start over scoring	27 95 49	1B 5F 31	ESC _ 1	P
Stop over scoring	27 95 48	1B 5F 30	ESC _ 0	P

FORMATTING FEATURES

Page Length Top of Form & Form Feed

After setting page length, the printer knows what size paper is being used. When the printer is switched on, the current location of the print head is recorded as the top of form, which is the position of the first line of printing on the page below the top margin. Inserting a Form Feed command after printing several lines moves the paper to the first printing line of the next page.

Formatting Features	Decimal	Hex.	ASCII	Comp.
Set page length by number of lines per page	27 67 n	1B 43 n	ESC C n	P F
Set page length by number of inches per page	27 67 0 n	1B 43 00 n	ESC C NUL n	PF
Set Top Of Form (TOF) at current print head position	27 52	1B 34	ESC 4	P
Advance paper to next TOF	12	0C	FF	P F

Line Spacing

Unless changed, the printer is normally set to print 6 lines per inch (LPI); the distance from the bottom of one letter to the bottom of the one below is 4.23 mm (1/6 inch). If more lines are required on a page, use the 8 LPI command (3-mm (1/8 inch) spacing), or the 2.45 mm (7/72-inch) spacing. The 8 LPI command is mostly used in 7-Bit Graphics.

Line Spacing	Decimal	Hex.	ASCII	Comp.
Set lines at 8 LPI	27 48	1B 30	ESC 0	P F
Set lines at 10.2 LPI	27 49	1B 31	ESC 1	P F

Fine Line Spacing

For graphics or special effects, use the fine lines per inch commands, which change the spacing in multiples of 1/72 inch or 1/216 inch. This does not affect the height of characters; it changes only the spacing between the lines. For example, if a fine lines per inch of 72/72 inch is selected, there is 1 inch between the bottom of one line and the bottom of the next. To set lines per inch in multiples of 1/72 inch, first use:

Fine Line Spacing	Decimal	Hex.	ASCII	Comp.
Set LPI in multiples of 1/72 in	27 65 n	1B 41 n	ESC A n	P F

The last code "n" is the multiple you require and is a number with a decimal value greater than 1 and less than 85.

For the Epson Mode that is all you need to do. For the IBM modes you must also activate the lines per inch set using:

Fine Line Spacing	Decimal	Hex.	ASCII	Comp.
Activate fine line spacing	27 50	1B 32	ESC 2	P

This command activates the fine lines per inch set by the CHR$(27);"A"; CHR$(1-85) command. These two commands are used to return to 6 LPI by having CHR$(1-85) equal 12 (12/72 inch equals 1/6 inch line spacing.)

Note:
When no Fine Line Spacing is specified prior to an activate command, the default spacing in the current menu is activated.

To set lines per inch in multiples of 1/216 inch up to 255/216 inch, use this command:

Set Lines Per Inch (LPI)	Decimal	Hex.	ASCII	Comp.
Set LPI in multiples of 1/216 in	27 51 1-255	1B 33 01-FF	ESC 3 n	P F

To execute a single line feed of 0.12 mm (1/216 inch) up to 29.98 mm (255/216 inch) use this command:

Variable Line Feed	Decimal	Hex.	ASCII	Comp.
Execute variable line feed	27 74 1-255	1B 4A 01-FF	ESC J n	P F

Note:
For both these commands in Epson Mode n = 0-255.

The last code equals a number between 1 and 255. This line spacing activates automatically when the printer receives this command.

For mechanical reasons, the printer advances paper in multiples of 1/144 inch, not in multiples of 1/216 inch, which is the standard for IBM printers. To increase IBM compatibility, the printer multiplies the variable value (01 to 255) by 2/3 to approximate 1/216 inch. Because of rounding off, lines per inch slightly vary sometimes from the specified statement. For more precise spacing, set lines per inch in multiples of 1/72 inch wherever possible.

Automatic Skip Over Perforation

This feature specifies where the printer will skip from the bottom of one page to the top of form of the next page. The printer automatically skips over the perforation between pages of computer paper and starts printing again at the next top of form. This feature can be used in a software program, eliminating the need for inserting the programming command for form feed (FF) after every page. After the automatic skipping distance is set, long documents of several pages long can be printed without the pages running together.

Before setting automatic skip over, it is a good idea to set the form length and top of form. Although automatic skip over perforation of one inch can be selected in the printer's menu, the following command can vary the distance skipped:

Auto Skip Over Perforation	Decimal	Hex.	ASCII	Comp.
Vary distance skipped-over perforation	27 78 1-255	1B 4E 01-FF	ESC N n	P F
Stop skip-over perforation	27 79	1B 4F	ESC O	P F

Note:
In this command, the 1 to 127 for Epson Modes or the 1 to 255 for IBM mode represent the number of lines skipped from the bottom of one page to the top of form of the next page.

Indenting

With this feature one line of print can be indented for the beginning of paragraphs, positioning headings, etc. The amount of indentation is calculated in dot columns. A dot column is the distance from the centre of one dot to the centre of the next dot within a character pattern. This distance varies according to the size of the character. The following table shows the measurements for each size:

	Character Width				
Dot Column Width	10 CPI	12 CPI	15 CPI	17.1 CPI	20 CPI
Inches	1/120	1/144	1/180	1/206	1/240
MM	0.21	0.18	0.14	0.12	0.11

Indentation to the exact dot position distance from the print head's home position can be set by entering the following control code sequence:

Indenting	Decimal	Hex.	ASCII	Comp.
Indenting	27 37 66 n1 n2 n3 n4	1B 25 42 n1 n2 n3 n4	ESC % B n1 n2 n3 n4	P

The column number (n1, n2, n3, n4) must be a four-digit number and cannot be less than the left margin or exceed the right margin. If programming in BASIC using hexadecimal, remember to represent each of the four digits with a two-digit hexadecimal number. Be sure to include the semicolon (;) at the end of this code sequence, otherwise the command will not work.

The actual amount of indentation varies with the character size, but the indentation relative to the next line remains the same.

Setting Page Margins

Set the left and right margins with:

Set Page Margins	Decimal	Hex.	ASCII	Comp.
Set page margins	27 88 n1 n2	1B 58 n1 n2	ESC X n1 n2	P

n1: left margin
n2: right margin

nl and n2 are converted to a multiple of 1/120 inch according to the character pitch (10/12/15/17.1/20CPI) at the time. Thereafter, the distance from the home position does not change even when the character pitch is changed.

The valid ranges for n1 and n2 are as follows:

n	CPI				
	10	12	15	17.1	20
n1	1-n1	1-n1	1-n1	1-n1	1-n1
n2	5-n2	6-n2	7-n2	9-n2	10-n2
n2-n1	4-n2-n1	5-n2-n1	6-n2-n1	8-n2-n1	9-n2-n1

The right margin must be at least 4 characters (at 10 CPI) to the right of the left margin. However, if n2 is greater than the default value, it is replaced with the default value and then the range is checked.

The default values for the right margin (n2) are as follows:

CPI				
10	12	15	17.1	20
136	163	204	233	272

If n1, n2, and n2-n1 are outside the range, the entire command is ignored and the left and right margins remain unchanged. The n1 and n2 values indicate left and right margins of the printable area.

Example

When n1 = 10 and n2 = 100, the print area is from column 10 to 100 with 91 printable columns.

The default value for the left margin is fixed at 1.

When the command is entered at the beginning of a line, it takes effect from that line. When it is entered in the middle of a line, it takes effect from the next line.

Automatic carriage return in word units as in IBM colour printer is not performed.

> ***Note:***
> *Word unit automatic carriage return means that when the right margin is exceeded, the last word is printed on the next line instead of being split at the end of a line. This is used with word processors.*

Horizontal Tabs

When the printer is switched on, tabs are set automatically for every eighth character, but these tab stops can be set to different requirements. Tab stops within a line can be set at the beginning of a program and a HT code inserted whenever it is required to skip to the next tab stop.

Up to 28 tab stops can be set in IBM mode or up to 32 in Epson mode but these tab stops must entered in a left-to-right sequence or in ascending numeric order.

In the Epson mode, the horizontal tabs should be relative to the actual left margin. In the IBM modes they are set from the absolute left margin (character column 0).

Character Column Tabs

Character Column Tabs	Decimal	Hex.	ASCII	Comp.
Set character column tabs	27 68 1st tab... 0	1B 44 1st tab... 00	ESC D 1st tab....NUL	P F

> ***Note:***
> *Character column number must be a one-byte binary. If programming in hexadecimal, remember that each digit must be represented by a two-digit hexadecimal number.*

The location of the rightmost possible tab stop depends on the printer model and character size being used (there are more characters on a line at 17.1 CPI than at 10 CPI). This chart shows the possible combinations.

Max Character Columns Per Line				
10 CPI	12 CPI	15 CPI	17.1 CPI	20 CPI
136	163	204	233	272

If trying to skip to a tab stop set beyond the width of the page, or skip to a tab where none was set, the printer advances the paper one line and begins printing at the first column of the next line..

Tab Stops	Decimal	Hex.	ASCII	Comp.
Skip to next tab stop	9	09	HT	P F
Clear tab stops	27 68 0	1B 44 00	ESC D NUL	P F

Vertical Tabs

The command VT advances the paper to the next vertical tab stop position. If automatic carriage return is on, a CR is done after each VT.

In Epson or IBM mode, if the next tab stop is greater than the form length (or the form length minus skip perforation) or no vertical tab stops are set, a VT command is treated as a line feed.

Up to 16 vertical tabs can be set in the Epson mode or up to 64 positions on a page in IBM mode. The vertical tab positions are set in lines and the line at the top of the form is line number 1.

Vertical Tabs	Decimal	Hex.	ASCII	Comp.
Set vertical tabs	27 66 1 ...64 0	1B 42 01 ...40 00	ESC B SOH @NUL	P F
Cancel vertical tabs	27 66 0	1B 42 00	ESC B NUL	P F
Skip to next vertical tab	11	0B	VT	F
Clear vertical tabs and set horizontal tabs	27 82	1B 52	ESC R	P

Note:
Horizontal tabs are set at every 8th position, starting at column 9.

MISCELLANEOUS FEATURES

Carriage Return & Line Feed

When the printer receives a Carriage Return (CR) command, it will print a line of data and return the print head to the left side of the page. When it receives a Line Feed (LF) command, the printer will advance the paper one line. Normally software automatically adds a carriage return and line feed at the end of a line, but it may be necessary to include these commands in a program.

Note:
Normally, the IBM PC adds a line feed command to each CR command. In IBM SET1, a CHR$(141) Carriage Return command can be sent causing a return without an automatic LF. If the printer prints several lines without advancing the paper, the printer's menu option AUTO LF should be set to YES.

Carriage Return & Line Feed	Decimal	Hex.	ASCII	Comp.
Carriage return	13	0D	CR	P F
Insert line feed	10	0A	LF	P F

Reverse Line Feed

Reverse Line Feed	Decimal	Hex.	ASCII	Comp.
Reverse line feed	27 93	1B 5D	ESC]	P

This executes an immediate reverse line feed, which is acted on only once upon receipt. Therefore, if a reverse of several lines is required, the command must be sent once for each reverse line feed required. It is not possible to reverse over the Top of Form.

Paper-out Override

To disable the paper-out switch to keep the printer printing to the very bottom of the page, enter:

Paper-out Override	Decimal	Hex.	ASCII	Comp.
Paper-out override	27 56	1B 38	ESC 8	P F
Reactivate paper-out sensor	27 57	1B 39	ESC 9	P F

Clear Buffer

This code eliminates a line of data if it has not yet been printed.

Clear Buffer	Decimal	Hex.	ASCII	Comp.
Clear buffer	24	18	CAN	P F

Print Head Direction

When printing reports with columns requiring precise alignment, unidirectional printing improves graphics print quality with more accurate column alignment. After specifying this feature, the printer prints only in one direction, left to right

.

Print Head Direction	Decimal	Hex.	ASCII	Comp.
Start unidirectional printing	27 85 49	1B 55 31	ESC U 1	P F
Return to bidirectional printing	27 85 48	1B 55 30	ESC U 0	P F

The Home Head command sends the print head to the left margin (also called the home position) to print the line that follows the command. This unidirectional printing occurs for one line only, then normal printing resumes. To send the print head home, use the following codes:

Home Head	Decimal	Hex.	ASCII	Comp.
Home head	27 60	1B 3C	ESC <	F

Backspacing

A backspace command is not acted on by the printer until a character or print command is given after it. If a backspace is repeatedly required to make several different combined symbols, add the BS command after each character followed by the overprinted character. If superscript printing is indicated, a BS command causes the printer to perform a reverse linefeed to the backspace position and then prints the next character as a superscript. Alignment is not guaranteed.

To print one character and then move the print head to the left and back over it to print another character, use the backspace command. This command helps create symbols not included on your keyboard, such as the plus/minus (±) sign, a cent sign and a less than or equal to sign.

Note:
A backspace will not be performed beyond the left margin.

Backspacing	Decimal	Hex.	ASCII	Comp.
Execute back space	8	08	BS	P F

Automatic Line Feed

When the automatic line feed is on, the printer does a line feed each time it receives a carriage return (CR).

Automatic Line Feed	Decimal	Hex.	ASCII	Comp.
Automatic line feed on	27 53 49	1B 35 31	ESC 5 1	P
Automatic line feed off	27 53 48	1B 35 30	ESC 5 0	P

Print Suppress Mode

This feature temporarily disconnects the printer from the computer by sending a control code. An ESC Q SYN code tells the printer to ignore all data except the DC1 code. A DC1 code releases the printer from the print suppress mode.

The PRINT SUPPRESS option in the printer's menu must be set to YES in order for the print suppress commands to be active. If this option is set to NO, these commands will be ignored by the printer.

Print Suppress Mode	Decimal	Hex.	ASCII	Comp.
Print suppress mode on	27 81 22	1B 51 16	ESC Q SYN	P
Print suppress mode off	17	11	DC1	P

Print Continuously

For programmers who would like to see what control codes were entered in a document, the following commands specify the printing of one or all normally non-printable characters below decimal 31 and between decimal 128 - 159 in IBM Set 1.

To print just one control character, use the ESC ^ Command followed by the control character you want to print.

Printing from All Char. Set	Decimal	Hex.	ASCII	Comp.
Print one character from All Character Set	27 94 n	1B 5E n	ESC ^ n	P
n = character to be printed				
Print continuously from All Character Set	27 92 n1 n2	1B 5C n1 n2	ESC \ n1 n2	P
followed by character to be printed				

To print more than one control character, the number of characters for printing has to be indicated. Less than 256 characters, then n1 is the number of characters and n2 is 0. For more than 255 characters, follow the ESC \ command with the total of the following formula:

n2 = int (Total number of characters/256)
n1 = Total number of characters - (n2 * 256)

When the ESC \ command is sent, the control codes do not operate but are printed as special characters which appear in the chart in Appendix B. For example, the ESC command prints as a left arrow. If the printer receives a code value for an unassigned character, a space is printed.

The All Character Set is to be found in Appendix B.

Bell (BEL)

This command will sound the printer`s bell every time the code is received.

Bell	Decimal	Hex.	ASCII	Comp.
BEL	7	07	BEL	P F

Emulation Mode

This command will change the emulation of the printer to the specified mode.

Emulation Mode	Decimal	Hex.	ASCII	Comp.
Emulation mode	27 123 n	1B 7B n	ESC { n	P F

n = 00h IBM PPR Emulation
01h Not used
02h IBM PPR Emulation
20h Reserved for OKI Microline Standard
21h Reserved for OKI Microline Standard
22h Reserved for OKI Pacemark
40h Epson FX Emulation
41h Epson FX Emulation

The default value is subject to the menu setting. When the emulation is changed, print mode/status will return to the settled menu mode or terminated.

Deselect Mode

The printer will not receive further data, in IBM mode only, by setting a busy signal and turning the ON-LINE indicator off, until the ON-LINE button is pressed or the I-PRIME signal is received.

Deselect Mode	Decimal	Hex.	ASCII	Comp.
Deselect mode	27 106 00	1B 6A 00	ESC j NUL	P

Initial Status

This command returns the printer, both in IBM and EPSON mode, to its initial settings, i.e. after power is switched on.

Initial Status	Decimal	Hex.	ASCII	Comp.
Initial Status	27 125 00	1B 7D 00	ESC } NUL	P F

Reset Inhibit

This command returns the printer to its initial settings, if the menu item Reset Inhibit is set to NO.

Reset Inhibit	Decimal	Hex.	ASCII	Comp.
Reset inhibit	27 91 75	1B 5B 4B	ESC [K	P

n1 n2 m1 n1 n2 m1 n1 n2 m1
m2 m3 m4 m2 m3 m4 m2 m3 m4
(n1 + n2 x 256) stands for the following parameters byte length.
m1 specifies the initialisation mode.
m2 specifies ID number of the printer, 03h or 16h (to be specified).
m3 and m4 specify the menu setting, after initialisation.

Epson FX Mode

This section gives the commands that are required to control printing features if Epson FX mode is selected. Some of these commands are common to IBM mode and these common commands are listed below for reference:

Features	Command
Double width	SO/DC4/ESC W
Emphasised	ESC E/F
Enhanced	ESC G/H
Super/subscripts	ESC S/T
Underlining	ESC -
Form length	ESC C
FF	FF
6/8 LPI	ESC 2/0
Line spacing	ESC A/J/3
Skip over perforation	ESC O/N
HTABS	HT/ESC D
VTABS	ESC B/VT
CR	CR
LF	LF
Paper out on/off	ESC 8/9
Clear buffer	CAN
Uni/bidirectional printing	ESC U
Unidirectional (1 line)	ESC <
Backspace	BS
Print suppress off	DC1
Cut Sheet Feeder	ESC EM I/R/1/2
Graphics	ESC K/L/Y/Z
15CPI	ESC g

CHARACTER PITCH

Character Pitch

With the following commands, the size of printed characters can be altered:

Character Pitch	Decimal	Hex	ASCII	Comp
Begin 10 CPI	27 80	1B 50	ESC P	F
Begin 12 CPI	27 77	1B 4D	ESC M	F
Begin Condensed mode	27 15 or 15	1B 0F or 0F	ESC SI or SI	F
Stop Condensed mode	18	12	DC2	F

The size of the condensed print depends on which pitch is selected at the time the command to set the condensed mode is sent.

Selection	Current pitch	Resulting pitch
After DC2	17.1 CPI	10 CPI
(condensed mode off)	20 CPI	12 CPI
After ESC SI	10 CPI	17.1 CPI
(condensed mode on)	12 CPI	20 CPI

Note 1:
None of these commands cancel the double width mode.

Note 2:
For certain applications it is necessary to know the number of characters that fit in one line.

Expand characters (double width print) for one line only with the following command.

Double width	Decimal	Hex.	ASCII	Comp.
Double width printing for one line only	27 14	1B 0E	ESC SO	F

Expand your characters to double height with the following command.

Double height	Decimal	Hex.	ASCII	Comp.
Start double height	21 119 49	1B 77 31	ESC w 1	F
End double height	27 119 48	1B 77 30	ESC w 0	F

Printing Modes

For fast printing at 800 characters per second (CPS) use utility mode, which is useful for high-volume printing, program listings or drafts.

Printing mode	Decimal	Hex	ASCII	Comp
Utility mode	27 120 0	1B 78 00	ESC x NUL	F
High Speed Draft (HSD) mode	27 40 48	1B 28 30	ESC (0	F
Near Letter Quality (NLQ) mode	27 120 1	1B 78 01	ESC x SOH	F
NLQ Courier	27 107 48	1B 6B 30	ESC k 0	F
NLQ Gothic	27 107 49	1B 6B 31	ESC k 1	F

If a little quality can be sacrificed for speed, select high speed draft (HSD) mode. In this print mode, printing is at 1066 CPS in 10 CPI. However draft mode is unavailable with double width, emphasised, enhanced, italics and proportional spacing.

When print quality counts, near letter quality (NLQ) mode offers high quality printing at 200 CPS.

Auto-justification	Decimal	Hex.	ASCII	Comp.
Begin auto-justification in NLQ mode	27 97 n	1B 61 n	ESC a n	F

The command for the auto justification in NLQ mode lets the printer be programmed to layout text in accordance with the following table.

n=	Justification
0	Left
1	Centre
2	Right
3	Full

Left (the default value) means that text will be aligned to the left margin. To centre a line of text between the left and right margins (for example, for headings, titles or captions) use the CHR$(27);"a";CHR$(1) command. Right justification is the opposite of the Left command. This means that the right margin will end evenly but the text at the left margin will be uneven. Finally, full justification adds the necessary spaces to a line of text so that both the right and left margins are even. This is carried out when the line buffer becomes full.

Italics

To highlight a phrase can be done by printing it in italics:

Italics	Decimal	Hex	ASCII	Comp
Begin Italics printing	27 52	1B 34	ESC 4	F
Stop Italics printing	27 53	1B 35	ESC 5	F

Setting MSB (7/8 bit Commands)

The other method of printing italics is to set the MSB (Most Significant Bit) to 1.

Setting MSB	Decimal	Hex.	ASCII	Comp.
Set MSB to 1	27 62	1B 3E	ESC >	F
Reset MSB	27 35	1B 23	ESC #	F
Set MSB to 0	27 61	1B 3D	ESC =	F

This limits the range of the CHR$ codes to the area from 128 to 255 decimal. If this command is used, all characters will be printed in italics (even if ESC 5 is sent) until the MSB is reset which means that bit 8 will be set as it is sent from a computer.

Also bit 8 (MSB) can be set to 0. This means that characters from the lower half of the character set (0 to 127) can be printed.

Proportional Spacing

To give text a more professional, typeset look, use proportional spacing. On switching off the proportional mode, the printer returns to its previous settings.

Proportional spacing	Decimal	Hex.	ASCII	Comp.
Begin proportional spacing	27 112 49	1B 70 31	ESC p 1	F
Stop proportional spacing	27 112 48	1B 70 30	ESC p 0	F

***Note**:*
This mode does not work with compressed or elite printing. If proportional is set together with 17.1 CPI, proportional text is printed, but in 10 CPI.

Space Between Characters

The dot space between the characters of the text can be set. The variable "n" is the number of dots to be added to the right of each character.

Space Between Characters	Decimal	Hex.	ASCII	Comp.
Space between characters	27 32 n	1B 20 n	ESC SP n	F

CPI	Value of n (in inches)
10	1/120
12	1/144
15	1/180
17.1	1/206
20	1/240

***Note**:*
This command is only valid for NLQ and Utility modes.

Set NLQ Mode

NLQ Mode	Decimal	Hex.	ASCII	Comp.
Set NLQ mode	27 75 n1	1B 4B n1	ESC K n1	F

n1 = 00h, 30h, 80h or B0h _ Courier typeface will be selected.
n1 = 01h, 31h, 81h or B1h _ Gothic typeface will be selected.

The other n1 values remain unaffected.

CHARACTER SETS

The Epson emulation offers a set of national character sets and code pages. The following tables give the value of n to select the different character sets. When a code page is selected and national character set command is sent, the code page will be reset to USA.

National characters	Decimal	Hex.	ASCII	Comp.
Select national character set and code pages	27 82 n	1B 52 n	ESC R n	F

Slashed zero can be selected by the menu even although code page is selected. ESC R 7 sets Spanish 1 when Standard Italic Character set is selected. ESC R 7 sets Cyrillic code page when Graphic character set is selected. When the code page selection command is sent the national character set will be reset to default.

National Character Sets

Hex	Dec	Language
00	0	American
01	1	French
02	2	German
03	3	British
04	4	Danish I
05	5	Swedish I
06	6	Italian
07	7	Spanish I
08	8	Japanese
09	9	Norwegian
0A	10	Danish II
0B	11	Spanish II
0C	12	Latin American
0D	13	French Canadian
0E	14	Dutch
0F	15	Swedish II
10	16	Swedish III
11	17	Swedish IV
12	18	Turkish
13	19	Swiss I
14	20	Swiss II
40	64	Publisher

Code Page Assignment

Hex	Dec	Code Page
15	21	Cyrillic 2-866
16	22	Polska Mazovia
17	23	ISO Latin 2
18	24	Serbo Croatic I
19	25	Serbo Croatic II
1A	26	Multilingual 850
1B	27	Norway 865
1C	28	Portugal 860
1D	29	Turkey
26	38	Greek 437
27	39	Greek 928
29	41	Greek 437 Cyprus
2A	42	ECMA 94
2B	43	Canada French

Hex	Dec	Code Page
2C	44	Cyrillic I - 855
2D	45	Cyrillic II - 866
2E	46	East Europe Latin 2-852
2F	47	Greek 869
31	49	Windows East Europe (CEE)
32	50	Windows Greek
33	51	Latin 5 (Windows Turkey)
34	52	Windows Cyrillic
36	54	Hungarian CWI
37	55	Kamenicky (MJK)
39	57	Turkey 857
3A	58	Roman 8
3C	60	Hebrew NC
3D	61	Hebrew OC
3E	62	Windows Hebrew
3F	63	KBL Lithuanian
42	66	Ukrainian
43	67	ISO Latin 6 (8859/10)
44	68	Windows Baltic
45	69	Cyrillic Latvian
48	72	Bulgarian
49	73	Icelandic 861
4A	74	Baltic 774

***Note**:*
For Code Pages Character Sets refer to Appendix B.

ESC! n	Language	Decimal Value															
		35	36	38	64	79	91	92	93	94	95	96	105	123	124	125	126
00 H	American	#	$	&	@	O	[	\	]	^	_	`	i	{	|	}	~
01 H	French	£	$	&	à	O	•	ç	§	^	_	`	i	é	ù	è	¨
02 H	German	#	$	&	§	O	Ä	Ö	Ü	^	_	`	i	ä	ö	ü	ß
03 H	British	£	$	&	@	O	[	\	]	^	_	`	i	{	|	}	~
04 H	Danish	#	$	&	@	O	Æ	Ø	Å	^	_	`	i	æ	ø	å	~
05 H	Swedish I	#	¤	&	É	O	Ä	Ö	Å	Ü	_	é	i	ä	ö	å	ü
06 H	Italian	#	$	&	@	O	°	\	é	^	_	ù	i	à	ò	è	ì
07 H	Spanish	P_t	$	&	@	O	¡	Ñ	¿	^	_	‘	i	¨	ñ	}	~
08 H	Japanese	#	$	&	@	O	[	¥	}	^	_	‘	i	{	|	}	~
09 H	Norwegian	#	¤	&	É	O	Æ	Ø	Å	Ü	_	é	i	æ	ø	å	ü
0A H	Danish II	#	$	&	É	O	Æ	Ø	Å	Ü	_	é	i	æ	ø	å	ü
0B H	Spanish II	#	$	&	á	O	¡	Ñ	¿	é	_	‘	i	í	ñ	ó	ú
0C H	Latin American	#	$	&	á	O	¡	Ñ	¿	é	_	ü	i	í	ñ	ó	ú
0D H	French Canadian	ü	$	ë	à	Ø	á	ç	ê	î	ï	ô	i	é	ù	è	û
0E H	Dutch	£	$	&	@	O	[	IJ	]	^	_	`	i	{	ij	}	~
0F H	Swedish II	#	$	&	É	O	Ä	Ö	Å	Ü	_	é	i	ä	ö	å	ü

ESC! n	Language	Decimal Value															
		35	36	38	64	79	91	92	93	94	95	96	105	123	124	125	126
10 H	Swedish III	§	$	&	É	O	Ä	Ö	Å	Ü	_	é	i	ä	ö	å	ü
11 H	Swedish IV	§	¤	&	É	O	Ä	Ö	Å	^	_	é	i	ä	ö	å	ü
12 H	Turkish	ş	$	ğ	Ş	O	i	ö	ü	Ğ	_	ç	i	Í	ö	ü	Ç
13 H	Swiss I	£	$	&	ç	O	à	é	è	^	_	`	i	ä	ö	ü	"
14 H	Swiss II	£	$	&	§	O	à	ç	è	^	_	`	i	ä	ö	ü	é
64 H	Publisher	#	$	&	§	O	°	´	¨	¶	±	`	i	©	•	†	≈

Epson Character Sets

These commands allow selection of the type of characters that are printed in the upper half of the Epson character tables. All of the available character sets can be found in Appendix B.

Select Character Set	Decimal	Hex.	ASCII	Comp.
Normal	27 116 0	1B 74 00	ESC t NUL	F
Line Graphics	27 116 1	1B 74 01	ESC t SOH	F

The normal character set duplicates the characters in positions 32 to 127 in italic style in the upper half of the set. The international characters are also available in italic printing when this set is selected.

The line graphics character set has various graphic and mathematical symbols present in positions 160 to 255, the upper half of the character set.

Code Area Expansion

This allows access and printing of characters stored in the ASCII areas 0 to 31 and 128 to 159 that are normally reserved for control codes. (See the Unassigned Codes table in Appendix B). Resetting the code expansion command returns the ASCII areas 0-31 and 128-159 to control codes.

Code area expansion	Decimal	Hex.	ASCII	Comp.
Code area expansion (0_31 and 128_159)	27 73 49	1B 49 31	ESC I 1	F
Return areas to control codes	27 73 48	1B 49 30	ESC I 0	F

The control areas from 128 to 159 and 255 (decimal) can be opened to give access to the international characters that are stored there (see the following Code Expansion Area table).

Code expansion area	Decimal	Hex.	ASCII	Comp.
Code expansion area (128-159 and 255)	27 54	1B 36	ESC 6	F
Return areas to control codes	27 55	1B 37	ESC 7	F

Note:
The access to 128-255 is also influenced by the setting of the MSB.

Composite Command

If programming the printer with a combination of print modes for a particular paragraph or line, typing in each command separately is not necessary because it can be done by using one command.

Composite command	Decimal	Hex.	ASCII	Comp.
Composite command	27 33 n	1B 21 n	ESC ! n	F

This is made possible through the specification of the variable "n" as in the following table:

Print mode	Decimal	Hex
Underline	128	80
Italics	64	40
Double width	32	20
Double strike	16	10
Emphasised	8	08
Condensed	4	04
Proportional	2	02
Elite	1	01
Pica	0	00

Some of these options are not available together. For example, it is obviously not possible to choose Elite and Pica together in one command. Maybe a short example will make this, rather complicated command, a little clearer:

A document requires printing where all the text will be in underlined, double width, emphasised and enhanced (double strike). This would normally entail programming four different commands before printing. With a composite command, it is only necessary to take the values for each mode from the table above: Underlined = 128, Double Width = 32, Double Strike = 16 and Emphasised = 8. Now add these values together and incorporate the result in the command like this:

n = 128 + 32 + 16 + 8 = 184

The command should now be CHR$(27);"!";CHR$(184) and from the receipt of this one command, the printer will print underlined, double width, emphasised and double strike text until it is changed again.

There is also no need to reset each mode separately. When a new combination is selected, the printer takes care of all the resetting.

Half Speed Printing

The half speed command can be used to set the printer to half the normal speed when printing in the Utility mode. This has no effect on the graphics and only reduces the printer noise.

Half speed printing	Decimal	Hex.	ASCII	Comp.
Switch to half speed printing	27 115 49	1B 73 31	ESC s 1	F
Switch to normal speed printing	27 115 48	1B 73 30	ESC s 0	F

Note:
Half speed printing is not available in HSD or NLQ modes.

FORMATTING FEATURES

Variable Line Feed

The reverse line feed command enables setting of a fine reverse LF of n/216 inches. This command is carried out only once. So if it is necessary to skip back a few times, this command will have to be sent once for each back-skip required.

Line feed	Decimal	Hex.	ASCII	Comp.
Reverse line feed n = 0 to 255	27 106 n	1B 6A n	ESC j n	F

It is not possible to reverse back over the Top Of Form.

Absolute & Relative Dot Positioning

The absolute dot position code sets the next printing position by counting in 1/60 inch dot units from the left margin.

Dot positioning	Decimal	Hex.	ASCII	Comp.
Absolute dot positioning	27 36 n1 n2	1B 24 n1 n2	ESC $ n1 n2	F
Relative dot positioning	27 92 n1 n2	1B 5C n1 n2	ESC \ n1 n2	F

n1 is decimal number between 0 and 255; n2 is a decimal number between 0 and 3.

Using these two variables, the specific dot position can be specified where printing should start. Variables can be calculated with this formula:

n2 = Int. (dot position/256) n1 = Dot pos. - (n2 x 256)

For example, if printing is required to start 300 dots in from the left margin, the calculation would look like this:

n2 = Int.(300/256) = 1
n1 = 300 - (1 x 256)
n1 = 300 - 256 = 44

so the command would read:

CHR$(27);"$";CHR$(44);CHR$(1);

To set the relative position the procedure is very similar except that the position is calculated in 1/120 inch dot spacing. The main difference is that, as the name suggests, the next printing position is calculated using the last printing position immediately before receipt of the command as the reference.

To move the print position to the right, calculate n1 and n2 from the number of dots that are required and enter these values into the command:

CHR$(27);CHR$(92);CHR$(n1);CHR$(n2).

Moving the relative print position to the left is a little more complicated. Firstly, determine the number of dots required. Subtract this value from 65536 (2^{16}). Finally, calculate n1 and n2 using the formula given above and enter the values into the command format.

***Note**:*
n1 and n2 are both decimal numbers between 0 and 255.

Both commands will be ignored if they set the dot position outside the margin limits.

Setting Margins

The left margin is set n1 characters from the head home position. The right margin is set n2 characters from the head home position.

Setting margins	Decimal	Hex.	ASCII	Comp.
Set left margin	27 108 n1	1B 6C n1	ESC l n1	F
Set right margin	27 81 n2	1B 51 n2	ESC Q n2	F

The value of the variables n1 and n2 must be within the ranges specified in the following table. Values outside these ranges will be ignored.

CPI	10	12	15	17	20
n1	0 ≤ n1 ≤ 134	0 ≤ n1 ≤ 160	0 ≤ n1 ≤ 192	0 ≤ n1 ≤ 229	0 ≤ n1 ≤ 251
n2	2 ≤ n2 ≤ 136	3 ≤ n2 ≤ 163	3 ≤ n2 ≤ 195	4 ≤ n2 ≤ 233	4 ≤ n2 ≤ 255
	n2 ≥ n1 + 2	n2 ≥ n1 + 3	n2 ≥ n1 + 3 n	2 ≥ n1 + 4 n	2 ≥ n1 + 4

How to Use this Table

When setting the right margin at 10 CPI, the right margin (n2) must be set at least two characters to the right of the left margin (n1). Therefore, n2 must be greater than or equal to n1 + 2; (n2 ≥ n1+2).

Setting the left margin does not affect the right margin. It does clear all the Horizontal Tabs and resets them every 8 characters starting with the new margin as position 0.

The left margin depends on the pitch at the time of setting. If the character pitch is changed the left margin will not move to accommodate this change.

Even if the printer is set to proportional mode, the column width will still be set in normal character size.

> ***Note:***
> *Any graphics data after the right margin will be lost. With text this is not the case. Should text exceed the right margin, the first character that goes beyond the limit set will become the first character on the next line.*

The Set Vertical Format Unit command has the same function as the Vertical Tab set (ESC B) but for 8 different channels (n= 0 . . .7). In this way it is possible to define up to eight groups each with up to 16 vertical tabs which can be called up with the select Vertical Format Unit command.

Vertical format unit	Decimal	Hex.	ASCII	Comp.
Set vertical format unit	27 98 n m1...m16 0	1B 62 n m1...m16 00	ESC b n m1 ...m16 NUL	F
Select vertical format unit	27 47 n	1B 2F n	ESC / n	F

This selects one of the 8 Vertical Format Units that were set up with the command 27/98/n/m1...m16/0. Where n is the number of the channel (n=0 to 7), and m is a specific line number and can be from 1 to 255.

Note:
At power up, the VFU channel n is set to 0.

MISCELLANEOUS FEATURES

Delete Last Character

The CHR$(127) code deletes the last character data that was input in the print buffer.

Delete last character	Decimal	Hex.	ASCII	Comp.
Delete last character	127	7F	DEL	F

If the code to be deleted was a space, CHR$(32), one space will be deleted on receipt of this command. If the last data was a horizontal tab skip, then only one space will be deleted—not the whole skip. If the data which is to be deleted is in the form of Bit Image Graphics data then this command is ignored.

Master Reset

The printer can be reset to its default menu settings, print buffer cleared, and Top Of Form set to the current print head position. If RESET INHIBIT is YES in the menu, this command will be ignored.

Master reset	Decimal	Hex.	ASCII	Comp.
Master reset	27 64	1B 40	ESC @	F

Print Suppress

After the printer has received the DC3 code, it will ignore all further data sent from the host until the code DC1 is received. The data will not be stored or printed.

Print suppress	Decimal	Hex.	ASCII	Comp.
Print suppress on	19	13	DC3	F
Print suppress off	17	11	DC1	F

During the time that the printer is in this mode the ONLINE indicator will flash. The printer can only be reselected with DC1—the ONLINE button will not reselect the printer.

Note:
The PRINT SUPPRESS option in the menu must be set to YES in order for these commands to be active. If this option is set to NO, the commands will be

ignored by the printer. (The SELECT-IN signal in the interface PIN 36, must be set to high, otherwise the DC1/DC3 command will be ignored).

Bell

This command will sound the printer`s bell every time this code is received.

Bell	Decimal	Hex.	ASCII	Comp.
BEL	7	07	BEL	P F

Appendix A - Control Code Tables

IBM MODE

P = Proprinter Mode F = Epson FX Mode

Function	ASCII	Decimal	Hex	Comp
Automatic line feed				
Auto LF OFF	ESC 5 0	27 53 48	1B 35 30	P
Auto LF ON (LF after each CR)	ESC 5 1	27 53 49	1B 35 31	P
Backspace	BS	8	08	P F
Carriage return	CR	13	0D	P F
Character Set				
IBM Character Set 1	ESC 7	27 55	1B 37	P
IBM Character Set 2	ESC 6	27 54	1B 36	P
International Character Set	ESC !	n 27 33 n	1B 21 n	P
Select code page	ESC [T ENQ NUL NUL NUL n1 n2 NUL	27 91 84 5 0 0 0 n1 n2 0	1B 5B 54 05 00 00 00 n1 n2 00	P
Print from All Character Set (one character only)	ESC ^ n	27 94 n	1B 5E n	P
Print from All Character Set (continuously)	ESC \n1 n2	27 92 n1 n2	1B 5C n1 n2	P
Character Pitch				
10 CPI (pica)	DC2	18	12	P
12 CPI (elite)	ESC :	27 58	1B 3A	P
17 or 20 CPI (condensed)	SI	15	0F	P
15 CPI (fine print)	ESC g	27 103	1B 67	P F
Clear Buffer	CAN	24	18	P F
Double height characters	ESC [@ n1 n2 m1..m4	27 91 64 n1 n2 m1..m4	1B 5B 40 n1 n2 m1..m4	P
Double width				
Double width (one line only)	SO	14	0E	P F
Double width OFF (before end of line)	DC4	20	14	P F
Double width OFF	ESC W 0	27 87 48	1B 57 30	P F
Double width ON	ESC W 1	27 87 49	1B 57 31	P F
Downline loadable character generator				
Copy standard set to DLL CG	ESC $	27 36	1B 24	P

Function	ASCII	Decimal	Hex	Comp
Designate DLL NLQ mode (Quasi-NLQ)	ESC I 6	27 73 54	1B 49 36	P
Designate DLL Utility mode	ESC I 4	27 73 52	1B 49 34	P
Exit DLL	ESC I 0 or ESC I 2	27 73 48 or 27 73 50	1B 49 30 or 1B 49 32	P
Load Proprinter DLL CG	ESC = n1 n2 DC4...	27 61 n1 n2 20 ...	18 3D n1 n2 14 ...	P
Enhanced/Emphasised				
Designates enhanced mode	ESC I 2	27 73 50	1B 49 32	P
Emphasised OFF	ESC F	27 70	1B 46	P F
Emphasised ON	ESC E	27 69	1B 45	P F
Enhanced OFF (double strike)	ESC H	27 72	1B 48	P F
Enhanced ON (double strike)	ESC G	27 71	1B 47	P F
Formatting				
Form feed	FF	12	0C	P F
Form length by inches (n=1 to 22 (XL:255))	ESC C NUL n	27 67 0 n	1B 43 00 n	P F
Form length by lines (n =1 to 127; (XL:255))	ESC C n	27 67 n	1B 43 n	P F
TOF set	ESC 4	27 52	1B 34	P
Graphics density				
Density double (120 x 72 DPI)	ESC Y n1 n2	27 89 n1 n2	18 59 n1 n2	P
Density double half speed (120 x 72 DPI) (Quasi-NLQ)	ESC L n1 n2	27 76 n1 n2	1B 4C n1 n2	P
Density quadruple (240 x 72 DPI)	ESC Z n1 n2	27 90 n1 n2	1B 5A n1 n2	P
Density single (60 x 72 DPI)	ESC K n1 n2	27 75 n1 n2	1B 4B n1 n2	P
Horizontal tabs				
Horizontal tabulator skip	HT	9	09	P F
HTABS clear	ESC D NUL	27 68 0	1B 44 00	P F
HTABS set by characters (k = 28 max.)	ESC D n1 - nk NUL	27 68 n1 - nk 0	1B 44 n1 - nk 00	P F
Indenting (print position by dot)	ESC % B n1 - n4	27 37 66 n1 - n4	1B 25 42 n1 - n4	P
Italics				
Italics (Slant) OFF	ESC % H	27 37 72	1B 25 48	P
Italics (Slant) ON	ESC % G	27 37 71	1B 25 47	P
Line Feed				
Line Feed	LF	10	0A	P F
Var. Line Feed n/216inch (n=1 to 255)	ESC J n	27 74 n	1B 4A n	P F
Line Spacing				
6 LPI (without prev. ESC A n)	ESC 2	27 50	1B 32	P F
8 LPI	ESC 0	27 48	1B 30	P F

Function	ASCII	Decimal	Hex	Comp
Enable variable line spacing (activates ESC A n)	ESC 2	27 50	1B 32	P
Line spacing 7/72 inch (for 7-bit graphics	ESC 1	27 49	1B 31	P F
Variable line spacing n/216 inch (n=0 to 255)	ESC 3 n	27 51 n	1B 33 n	P F
Variable line spacing n/72 inch (ESC 2 must follow !) (n=1 to 85)	ESC A n	27 65 n	1B 41 n	P F
Margins				
Margin set left and right (by character columns)	ESC X n1 n2	27 88 n1 n2	1B 58 n1 n2	P
Near Letter Quality				
NLQ On	ESC G	27 71	1B 47	P
Designates NLQ Courier mode	ESC I 3	27 73 51	1B 49 33	P
Designates NLQ Gothic mode	ESC I 2	27 73 50	1B 49 32	P
NLQ Off	ESC H	27 72	1B 48	P
Overscore				
Overscore OFF	ESC _ 0	27 95 48	1B 5F 30	P
Overscore ON	ESC _ 1	27 95 49	1B 5F 31	P
Paper out sensor				
Paper-out sensor OFF	ESC 8	27 56	1B 38	P F
Paper-out sensor ON	ESC 9	27 57	1B 39	P F
Print head direction				
Unidirectional print OFF	ESC U 0	27 85 48	1B 55 30	P F
Unidirectional print ON	ESC U 1	27 85 49	1B 55 31	P F
Print Suppress				
Print suppress OFF	DC1	17	11	P
Print suppress ON (no print until DC1)	ESC Q SYN	27 81 22	1B 51 16	P
Proportional Spacing				
Proportional spacing OFF	ESC P 0	27 80 48	1B 50 30	P
Proportional spacing ON	ESC P 1	27 80 49	1B 50 31	P
Skip-over perforation				
Skip-over perforation (n=1 to 127 (XL:255))	ESC N n	27 78 n	1B 4E n	P
Skip-over perforation OFF	ESC O	27 79	1B 4F	P
Spacing between characters				
Space between characters (n=1 to 11)	ESC V n	27 86 n	1B 56 n	P F
Return to standard spacing	ESC V 0	27 86 00	1B 56 00	P F
Superscript/subscript				
Subscript ON (SOH or any odd number)	ESC S 1	27 83 49	1B 53 31	P

Function	ASCII	Decimal	Hex	Comp
Superscript ON (NUL or any even number)	ESC S 0	27 83 48	1B 53 30	P
Super/Subscript OFF	ESC T	27 84	1B 54	P
Underlining				
Underlining OFF (underscore)	ESC - 0	27 45 48	1B 2D 30	P
Underlining ON (underscore)	ESC - 1	27 45 49	1B 2D 31	P
Utility/draft mode				
Designates HSD mode	ESC # 0	27 35 48	1B 23 30	P
Designates Utility mode	ESC I 1	27 73 49	1B 49 31	P
Designates Utility mode	ESC I 0	27 73 48	1B 49 30	P
Vertical tabs				
Cancel VTABS, set HTABS.	ESC R	27 82	1B 52	P
Vertical tabulator cancel	ESC B NUL	27 66 0	1B 42 00	P F
Vertical tabulator set	ESC B n1...n64 NUL	27 66 n1...n64 0	1B 42 n1...n64 00	P F
Vertical tabulator skip (same as LF if no tab)	VT	11	0B	F
Miscellaneous Commands				
BEL (sound printer's bell)	BEL	7	07	P F
Emulation Mode	ESC {n	27 123	27 7B n	P F
Deselect Mode	ESC j NUL	27 106 0	1B 6A 00	P
Initial Status	ESC } NUL	27 125 0	1B 7D 00	P F
IBM Code Page Selection	ESC [T n1 n2 NUL NUL m1 m2 NUL	27 91 84 n1 n2 0 0 m1 m2 0	1B 5B 54 n1 n2 00 00 m1 m2 00	P
Bar Code Selection	ESC DLE A n1 m1 m2 m3 m4 m5 m6 m7 m8	27 16 65 n1 m1 m2 m3 m4 m5 m6 m7 m8	1B 10 41 n1 m1 m2 m3 m4 m5 m6 m7 m8	P F
Bar Code Printing	ESC DLE B n1 [data]	27 16 66 n1 [data]	1B 10 42 n1 [data]	P F
Post Net Barcode printing	ESC DLE C n1 [data]	27 16 67 n1[data]	1B 10 43 n1 [data]	P F
Reset Inhibit	ESC [K n1 n2 m1 m2 m3 m4	27 91 75 n1 n2 m1 m2 m3 m4	1B 5B 4B n1 n2 m1 m2 m3 m4	P

EPSON FX MODE

(FX-85/FX-105 compatible)

Function	ASCII	Decimal	Hex
Backspace	BS	8	08
Carriage return	CR	13	0D
Character Set			
Code expansion OFF (128 - 159 + 255 CTRL code)	ESC 7	27 55	1B 37
Code expansion ON (128 - 158 + 255 printable)	ESC 6	27 54	1B 36
National character set	ESC R n	27 82 n	1B 52 n
Normal character set	ESC t NUL	27 116 0	1B 74 00
Line graphics character set	ESC t SOH	27 116 1	1B 74 01
Unassigned code print OFF (CTRL code 0 - 31 128 - 159)	ESC I 0	27 73 48	1B 49 30
Unassigned code print ON (CHR$ and control codes)	ESC I 1	27 73 49	1B 49 31
Character Pitch			
10 CPI (pica)	ESC P	27 80	1B 50
12 CPI (elite)	ESC M	27 77	1B 4D
15 CPI	ESC g	27 103	1B 67
17 CPI, 20 CPI if 12 (condensed)	SI	15	0F
17 CPI, 20 CPI if 12 (condensed)	ESC SI	27 15	1B 0F
Reset condensed mode (20 -> 12 + 17 -> 10 CPI)	DC2	18	12
Clear buffer			
Clear buffer	CAN	24	18
Clear buffer/master reset (sets defaults)	ESC @	27 64	1B 40
Code Page Selection	ESC R n	27 82 n	1B 52 n
Composite selection (of print modes)	ESC ! n	27 33 n	1B 21 n
Delete			
Delete last character (in buffer)	DEL	127	7F
Dot position			
Dot position absolute (in 1/60 inch units)	ESC $ n1 n2	27 36 n1 n2	1B 24 n1 n2
Dot position relative (in 1/120 inch units)	ESC \ n1 n2	27 92 n1 n2	1B 5C n1 n2
Double height			
Double height OFF	ESC w 0	27 119 48	1B 77 30
Double height ON	ESC w 1	27 119 49	1B 77 31
Double width			
Double width (for one line only)	ESC SO	27 14	1B 0E

Function	ASCII	Decimal	Hex
Double width OFF (before end of line)	DC4	20	14
Double width OFF	ESC W 0	27 87 48	1B 57 30
Double Width ON	ESC W 1	27 87 49	1B 57 31
Downline loadable character generator			
Copy standard set to DLL CG	ESC : NUL NUL NUL	27 58 0 0 0	1B 3A 00 00 00
Designates DLL CHR. SET	ESC % SOH	27 37 1	1B 25 01
Exit DLL (to DP-mode)	ESC % NUL	27 37 0	1B 25 00
Load DLL character	ESC & NUL n m a p1	27 38 0 n m a p1	1B 26 00 n m a p1
Enhanced/Emphasised			
Emphasised OFF	ESC F	27 70	1B 46
Emphasised ON	ESC E	27 69	1B 45
Emphasised OFF (double strike)	ESC H	27 72	1B 48
Enhanced ON (double strike)	ESC G	27 71	1B 47
Formatting			
Form Feed	FF	12	0C
Form length by inches (n = 1 to 22)	ESC C NUL n	27 67 0 n	1B 43 00 n
Form length by lines (n = 1 to 127)	ESC C n	27 67 n	1B 43 n
Graphic modes			
Select 8-bit graphics m = 0 to 7	ESC * m n1 n2 v1 - vk	27 42 m n1 n2 v1 - vk	1B 2A m n1 n2 v1 - vk
Select 9-bit graphics	ESC ^ m n1 n2 v...	27 94 m n1 n2 v..	1B 5E m n1 n2 v...
Graphics density			
Density double (120 x 72 DPI)	ESC Y n1 n2	27 89 n1 n2	1B 59 n1 n2
Density double half speed (120 x 72 DPI)	ESC L n1 n2	27 76 n1 n2	1B 4C n1 n2
Density quadruple (240 x 72 DPI)	ESC Z n1 n2	27 90 n1 n2	1B 5A n1 n2
Density single (60 x 72 DPI)	ESC K n1 n2	27 75 n1 n2	1B 4B n1 n2
Reassign ALT. graph codes (ESC * to ESC K, L, Y, Z)	ESC ? m p	27 63 m p	1B 3F m p
Horizontal tabs			
Horizontal tabulator skip	HT	9	09
HTABS clear	ESC D NUL	27 68 0	1B 44 00
HTABS set by characters (k = max. 32)	ESC D n1 - nk NUL	27 68 n1 - nk 00	1B 44 n1 - nk 00
Italics			
Italics OFF	ESC 5	27 53	1B 35
Italics ON	ESC 4	27 52	1B 34
Line feed			
Line feed	LF	10	0A

Function	ASCII	Decimal	Hex
Variable line feed n/216 inch (n = 0 to 255)	ESC J n	27 74 n	1B 4A n
Variable rev. line feed n/216 inch (n = 0 to 255)	ESC j n	27 106 n	1B 6A n
Line Spacing			
6 LPI	ESC 2	27 50	1B 32
8 LPI	ESC 0	27 48	1B 30
Line spacing 7/72 inch (for 7-bit graphics)	ESC 1	27 49	1B 31
Variable line spacing n/216 inch (n = 1 to 255)	ESC 3 n	27 51 n	1B 33 n
Variable line spacing n/72 inch (n = 1 to 85)	ESC A n	27 65 n	1B 41 n
Margins			
Margin left set	ESC l n	27 108 n	1B 6C n
Margin right set	ESC Q n	27 81 n	1B 51 n
Miscellaneous			
Half speed printing OFF	ESC s 0	27 115 48	1B 73 30
Half speed printing ON	ESC s 1	27 115 49	1B 73 31
MSB setting			
Cancel MSB setting	ESC #	27 35	1B 23
MSB set 0	ESC =	27 61	1B 3D
MSB set 1	ESC >	27 62	1B 3E
Near Letter Quality			
NLQ auto justification (left, mid, right, full)	ESC a n	27 97 n	1B 61 n
Select font NLQ	ESC x SOH	27 120 1	1B 78 01
Paper out sensor			
Paper out sensor OFF	ESC 8	27 56	1B 38
Paper out sensor ON	ESC 9	27 57	1B 39
Print head direction			
Unidirectional print (home head) (for one line only)	ESC <	27 60	1B 3C
Unidirectional print OFF	ESC U 0	27 85 48	1B 55 30
Unidirectional print ON	ESC U 1	27 85 49	1B 55 31
Print Suppress			
Print suppress OFF	DC1	17	11
Print suppress ON (no print until DC1)	DC3	19	13
Proportional Spacing			
Proportional spacing OFF	ESC p 0	27 112 48	1B 70 30
Proportional spacing ON	ESC p 1	27 112 49	1B 70 31
Skip-over perforation			

Function	ASCII	Decimal	Hex
Skip-over perforation (n = 1 to 127)	ESC N n	27 78 n	1B 4E n
Skip-over perforation OFF	ESC O	27 79	1B 4F
Spacing between characters	ESC SP n	27 32 n	1B 20 n
Set NLQ Mode (n = 0 to 127)	ESC K n1	1B 4B n1	1B 4B n1
Superscript/subscript			
Sub/superscript OFF	ESC T	27 84	1B 54
Subscript ON	ESC S 1	27 83 49	1B 53 31
Sub/superscript OFF	ESC T	27 84	1B 54
Superscript ON	ESC S 0	27 83 48	1B 53 30
Underlining			
Underline OFF (underscore)	ESC - 0	27 45 48	1B 2D 30
Underline ON (underscore)	ESC - 1	27 45 49	1B 2D 31
Utility/draft mode			
Designates HSD mode (SSD at 12 CPI)	ESC (0	27 40 48	1B 28 30
Select font utility	ESC x NUL	27 120 0	1B 78 00
Vertical format unit			
VFU channel select (n = 0 to 7)	ESC / n	27 47 n	1B 2F n
VFU load (k = 1 to 16)	ESC b n m1...mk NUL	27 98 n m1... mk 0	1B 62 n m1...mk 00
Vertical tabs			
Vertical tabulator cancel	ESC B NUL	27 66 0	1B 42 00
Vertical tabulator set	ESC B n1...n16 NUL	27 66 n1...n16 0	1B 42 n1...n16 00
Vertical tabulator skip	VT	11	0B
Barcode Print Application			
Barcode Selection	ESC DLE A n1 m1 m2 m3 m4 m5 m6 m7 m8	27 16 65 n1 m1 m2 m3 m4 m5 m6 m7 m8	1B 10 41 n1 m1 m2 m3 m4 m5 m6 m7 m8
Barcode Printing	ESC DLE B n1 [data]	27 16 66 n1 [data]	1B 10 42 n1 [data]
Post Net Barcode	ESC DLE C n1 [data]	27 16 67 n1 [data]	1B 10 43 n1 [data]

Appendix B - Character Tables

CODE PAGE CHARACTER SETS

USA

ID 437

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

Canadian French

ID 863

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	Ç	É	¦	▒	└	╨	α	≡
1			!	1	A	Q	a	q	ü	È	´	▨	┴	╤	ß	±
2			"	2	B	R	b	r	é	Ê	ó	▓	┬	╥	Γ	≥
3			#	3	C	S	c	s	â	ô	ú	│	├	╙	π	≤
4			$	4	D	T	d	t	Â	Ë	¨	┤	─	╘	Σ	⌠
5			%	5	E	U	e	u	à	Ï	¸	╡	┼	╒	σ	⌡
6			&	6	F	V	f	v	¶	û	³	╢	╞	╓	µ	÷
7			'	7	G	W	g	w	ç	ù	¯	╖	╟	╫	τ	≈
8			(	8	H	X	h	x	ê	¤	Î	╕	╚	╪	Φ	°
9			)	9	I	Y	i	y	ë	Ô	⌐	╣	╔	┘	θ	•
A			*	:	J	Z	j	z	è	Ü	¬	║	╩	┌	Ω	·
B			+	;	K	[	k	{	ï	¢	½	╗	╦	█	δ	√
C			,	<	L	\	l	|	î	£	¼	╝	╠	▄	∞	n
D			-	=	M	]	m	}	_	Ù	¾	╜	═	▌	φ	2
E			.	>	N	^	n	~	Å	Ú	«	╛	╬	▐	∈	▪
F			/	?	O	_	o		§	ƒ	»	┐	╧	▀	∩	

Mulitlingual

ID 850

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	Ç	É	á	▒	└	ð	Ó	–
1			!	1	A	Q	a	q	ü	æ	í	▓	┴	Ð	ß	±
2			"	2	B	R	b	r	é	Æ	ó	▓	┬	Ê	Ô	=
3			#	3	C	S	c	s	â	ô	ú	┃	├	Ë	Ò	¾
4			$	4	D	T	d	t	ä	ö	ñ	┤	─	È	õ	¶
5			%	5	E	U	e	u	à	ò	Ñ	Á	┼	ı	Õ	§
6			&	6	F	V	f	v	å	û	ª	Â	ã	Í	µ	÷
7			'	7	G	W	g	w	ç	ù	º	À	Ã	Î	Þ	¸
8			(	8	H	X	h	x	ê	ÿ	¿	©	╚	Ï	þ	°
9			)	9	I	Y	i	y	ë	Ö	®	╣	╔	┘	Ú	¨
A			*	:	J	Z	j	z	è	Ü	¬	╠	╩	┌	Û	·
B			+	;	K	[	k	{	ï	ø	½	╗	╦	■	Ù	¹
C			,	<	L	\	l	|	î	£	¼	╝	╠	■	ý	³
D			-	=	M	]	m	}	ì	Ø	¡	¢	=	¦	Ý	²
E			.	>	N	^	n	~	Ä	×	«	¥	╬	Ì	¯	▪
F			/	?	O	_	o		Å	*ƒ*	»	┐	¤	■	´	

Portugal

ID 860

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

Norway

ID 865

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

Turkey

ID 1012

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

Greek 437

ID 1008

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	A	P	ι	▒	└	╨	ω	≡
1			!	1	A	Q	a	q	B	Σ	κ	▓	┴	╤	ά	±
2			"	2	B	R	b	r	Γ	T	λ	▓	┬	╥	έ	≥
3			#	3	C	S	c	s	Δ	Y	μ	┃	├	╙	ή	≤
4			$	4	D	T	d	t	E	Φ	ν	┤	─	╘	ϊ	⌠
5			%	5	E	U	e	u	Z	X	ξ	┫	┼	╒	ί	⌡
6			&	6	F	V	f	v	H	Ψ	ο	┣	╞	╓	ό	÷
7			'	7	G	W	g	w	Θ	Ω	π	┳	╟	╫	ύ	≈
8			(	8	H	X	h	x	I	α	ρ	┻	╚	╪	ϋ	°
9			)	9	I	Y	i	y	K	β	σ	╋	╔	┘	ώ	•
A			*	:	J	Z	j	z	Λ	γ	ς	╇	╩	┌	Ω	¨
B			+	;	K	[	k	{	M	δ	τ	╗	╦	█	δ	√
C			,	<	L	\	l	|	N	ε	υ	╝	╠	■	∞	ⁿ
D			-	=	M	]	m	}	Ξ	ζ	φ	╜	═	▌	φ	²
E			.	>	N	^	n	~	O	η	χ	╛	╬	▐	∈	▪
F			/	?	O	_	o		Π	ϑ	ψ	┐	╧	▀	∩	

Greek 869

ID 869

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p		΄Ι	ϊ	▒	└	Τ	ζ	-
1			!	1	A	Q	a	q		Ϊ		▨	┴	ϒ	η	±
2			"	2	B	R	b	r		Ό	ό	▓	┬	Φ	ΰ	υ
3			#	3	C	S	c	s			ύ	┃	├	Χ	ι	φ
4			$	4	D	T	d	t			Α	┤	─	Ψ	κ	χ
5			%	5	E	U	e	u		΄ϒ	Β		┼	Ω	λ	§
6			&	6	F	V	f	v	Ά	΅ϒ	Γ	∩	Π	α	μ	ψ
7			'	7	G	W	g	w		©	Δ	Μ	Ρ	β	ν	΅
8			(	8	H	X	h	x	–	Ώ	Ε	Ν	╚	γ	ξ	°
9			)	9	I	Y	i	y	¬	²	Ζ	╣	╔	┘	ο	¨
A			*	:	J	Z	j	z	¦	³	Η	║	╩	┌	π	ω
B			+	;	K	[	k	{	’	ά	½	╗	╦	■	ρ	ϋ
C			,	<	L	\	l	|	‘	£	θ	╝	╠	■	σ	ΰ
D			-	=	M	]	m	}	Έ	έ	Ι	Ξ	=	δ	ς	ώ
E			.	>	N	^	n	~	—	ή	«	Ο	╬	ϵ	τ	▪
F			/	?	O	_	o		Ή	ί	»	┐	Σ	■	′	

Greek 928

ID 1009

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	Ç	É		°		Π	ΰ	π
1			!	1	A	Q	a	q	ü	æ	'	±	Α	Ρ	α	ρ
2			"	2	B	R	b	r	é	Æ	'	²	Β		β	ς
3			#	3	C	S	c	s	â	ô	£	³	Γ	Σ	γ	σ
4			$	4	D	T	d	t	ä	ö		΄	Δ	Τ	δ	τ
5			%	5	E	U	e	u	à	ò		΅	Ε	Υ	ε	υ
6			&	6	F	V	f	v	å	û	|	Ά	Ζ	Φ	ζ	φ
7			'	7	G	W	g	w	ç	ù	§	·	Η	Χ	η	χ
8			(	8	H	X	h	x	ê	ÿ	¨	Έ	Θ	Ψ	θ	ψ
9			)	9	I	Y	i	y	ë	Ö	©	Ή	Ι	Ω	ι	ω
A			*	:	J	Z	j	z	è	Ü		Ί	Κ	Ϊ	κ	ϊ
B			+	;	K	[	k	{	ï	¢	«	»	Λ	Ϋ	λ	ϋ
C			,	<	L	\	l	|	î	£	¬	Ό	Μ	ά	μ	ό
D			-	=	M	]	m	}	ì	¥		½	Ν	έ	ν	ύ
E			.	>	N	^	n	~	Ä	₧		Ύ	Ξ	ή	ξ	ώ
F			/	?	O	_	o		Å	ƒ	-	Ώ	Ο	ί	ο	

Greek 437 Cyprus

ID 1011

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	Α	Ρ	ι	▒	└	╨	ω	≡
1			!	1	A	Q	a	q	Β	Σ	κ	▒	┴	╤	ά	±
2			"	2	B	R	b	r	Γ	Τ	λ	▓	┬	╥	έ	≥
3			#	3	C	S	c	s	Δ	Γ	μ	│	├	╙	ή	≤
4			$	4	D	T	d	t	Ε	Φ	ν	┤	─	╘	ϊ	⌠
5			%	5	E	U	e	u	Ζ	Χ	ξ	╡	┼	╒	ί	⌡
6			&	6	F	V	f	v	Η	Ψ	ο	╢	╞	╓	ό	÷
7			'	7	G	W	g	w	Θ	Ω	π	╖	╟	╫	ύ	≈
8			(	8	H	X	h	x	Ι	α	ρ	╕	╚	╪	ϋ	°
9			)	9	I	Y	i	y	Κ	β	σ	╣	╔	┘	ώ	∙
A			*	:	J	Z	j	z	Λ	ϒ	ς	║	╩	┌	Ω	·
B			+	;	K	[	k	{	Μ	δ	τ	╗	╦	█	£	√
C			,	<	L	\	l	|	Ν	ϵ	υ	╝	╠	▄	∞	n
D			-	=	M	]	m	}	Ξ	ζ	φ	╜	═	▌	ϕ	2
E			.	>	N	^	n	~	Ο	η	χ	╛	╬	▐	î	▪
F			/	?	O	_	o		Π	θ	ψ	┐	╧	▀	ΰ	

Polska Mazovia

ID 1014

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

Serbo Croatic 1

ID 1016

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

Serbo Croatic 2

ID 1017

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

ECMA 94

ID 1018

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	Ç	É		°	À	Ð	à	ð
1			!	1	A	Q	a	q	ü	æ	¡	±	Á	Ñ	á	ñ
2			"	2	B	R	b	r	é	Æ	¢	²	Â	Ò	â	ò
3			#	3	C	S	c	s	â	ô	£	³	Ã	Ó	ã	ó
4			$	4	D	T	d	t	ä	ö	¤	´	Ä	Ô	ä	ô
5			%	5	E	U	e	u	à	ò	¥	µ	Å	Õ	å	õ
6			&	6	F	V	f	v	å	û	¦	¶	Æ	Ö	æ	ö
7			'	7	G	W	g	w	ç	ù	§	•	Ç	×	ç	÷
8			(	8	H	X	h	x	ê	ÿ	¨	¸	È	Ø	è	ø
9			)	9	I	Y	i	y	ë	Ö	©	¹	É	Ù	é	ù
A			*	:	J	Z	j	z	è	Ü	ª	º	Ê	Ú	ê	ú
B			+	;	K	[	k	{	ï	¢	«	»	Ë	Û	ë	û
C			,	<	L	\	l	|	î	£	¬	¼	Ì	Ü	ì	ü
D			-	=	M	]	m	}	ì	¥	-	½	Í	Ý	í	ý
E			.	>	N	^	n	~	Ä	₧	®	¾	Î	Þ	î	þ
F			/	?	O	_	o		Å	ƒ	¯	¿	Ï	ß	ï	ÿ

Hungarian CWI

ID 1024

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

Windows Greek

ID 1020

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				°	ΐ	Π	ΰ	π
1			!	1	A	Q	a	q		'	΅	±	Α	Ρ	α	ρ
2			"	2	B	R	b	r	‚	’	Ά	²	Β		β	ς
3			#	3	C	S	c	s	*f*	“	£	³	Γ	Σ	γ	σ
4			$	4	D	T	d	t	„	”	¤	΄	Δ	Τ	δ	τ
5			%	5	E	U	e	u	…	•	¥	µ	Ε	Υ	ε	υ
6			&	6	F	V	f	v	†	-	¦	¶	Ζ	Φ	ζ	φ
7			'	7	G	W	g	w	‡	–	§	·	Η	Χ	η	χ
8			(	8	H	X	h	x			¨	Έ	Θ	Ψ	θ	ψ
9			)	9	I	Y	i	y	‰	™	©	Ή	Ι	Ω	ι	ω
A			*	:	J	Z	j	z			ª	Ί	Κ	Ϊ	κ	ϊ
B			+	;	K	[	k	{	<	>	«	»	Λ	Ϋ	λ	ϋ
C			,	<	L	\	l	|			¬	Ό	Μ	ά	µ	ό
D			-	=	M	]	m	}			–	½	Ν	έ	ν	ύ
E			.	>	N	^	n	~			®	Ύ	Ξ	ή	ξ	ώ
F			/	?	O	_	o				—	Ώ	Ο	ί	ο	

Windows East Europe (CEE)

ID 1019

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				°	Ŕ	Đ	ŕ	đ
1			!	1	A	Q	a	q		‘	˘	±	Á	Ń	á	ń
2			"	2	B	R	b	r	¸	’	ˇ	¸	Â	Ň	â	ň
3			#	3	C	S	c	s		“	Ł	ł	Ă	Ó	ă	ó
4			$	4	D	T	d	t	„	”	¤	´	Ä	Ô	ä	ô
5			%	5	E	U	e	u	…	•	Ą	µ	Ĺ	Ő	Í	ő
6			&	6	F	V	f	v	†	—	¦	¶	Ć	Ö	ć	ö
7			'	7	G	W	g	w	‡	–	§	·	Ç	×	ç	÷
8			(	8	H	X	h	x			¨	¸	Č	Ř	č	ř
9			)	9	I	Y	i	y	‰	™	©	ą	É	Ů	é	ů
A			*	:	J	Z	j	z	Š	š	Ş	ş	Ę	Ú	ę	ú
B			+	;	K	[	k	{	<	>	«	»	Ë	Ű	ë	ű
C			,	<	L	\	l	|	Ś	ś	¬	Ľ	Ě	Ü	ě	ü
D			-	=	M	]	m	}	Ť	ť	–		Í	Ý	í	ý
E			.	>	N	^	n	~	Ž	ž	®	ľ	Î	Ţ	î	ţ
F			/	?	O	_	o		Ź	ź	Ż	ż	Ď	ß	đ	˙

Windows Cyrillic

ID 1022

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	Ђ	ђ		°	А	Р	а	р
1			!	1	A	Q	a	q	Ѓ	‘	Ў	±	Б	С	б	с
2			"	2	B	R	b	r	,	’	ў	І	В	Т	в	т
3			#	3	C	S	c	s	ѓ	“	Ј	і	Г	г	У	у
4			$	4	D	T	d	t	„	”	¤	ґ	Д	д	Ф	ф
5			%	5	E	U	e	u	…	•	Ґ	µ	Е	Х	е	х
6			&	6	F	V	f	v	†	—	¦	¶	Ж	Ц	ж	ц
7			'	7	G	W	g	w	‡	–	§	·	З	Ч	з	ч
8			(	8	H	X	h	x			Ё	ё	И	Ш	и	ш
9			)	9	I	Y	i	y	‰	™	©	№	Й	Щ	й	щ
A			*	:	J	Z	j	z	Љ	љ	Є	є	К	Ъ	к	ъ
B			+	;	K	[	k	{	<	>	«	»	П	Ы	п	ы
C			,	<	L	\	l	|	Њ	њ	¬	j	М	Ь	м	ь
D			-	=	M	]	m	}	Ќ	ќ	-	S	Н	Э	н	э
E			.	>	N	^	n	~	Ћ	ћ	®	s	О	Ю	о	ю
F			/	?	O	_	O		Џ	џ	Ї	ї	П	Я	п	я

East Europe Latin 2-852

ID 852

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	Ç	É	á	▒	└	đ	Ó	-
1			!	1	A	Q	a	q	ü	Ĺ	í	▓	┴	Đ	ß	”
2			"	2	B	R	b	r	é	Í	ó	▓	┬	Ď	Ô	˛
3			#	3	C	S	c	s	â	ô	ú	┃	├	Ë	Ń	ˇ
4			$	4	D	T	d	t	ä	ö	Ą	┤	─	ď	ń	˘
5			%	5	E	U	e	u	ů	Ľ	ą	Á	┼	Ň	ň	§
6			&	6	F	V	f	v	ć	ľ	Ž	Â	Ă	Í	Š	÷
7			'	7	G	W	g	w	ç	Ś	ž	Ě	ă	Î	š	,
8			(	8	H	X	h	x	ł	ś	Ę	Ş	╚	ě	Ŕ	°
9			)	9	I	Y	i	y	ë	Ö	ę	╣	╔	┘	Ú	¨
A			*	:	J	Z	j	z	Ő	Ü	¬	╠	╩	┌	ŕ	·
B			+	;	K	[	k	{	ő	Ť	ź	╗	╦	▉	Ű	ű
C			,	<	L	\	l	|	î	ť	Č	╝	╞	■	ý	Ř
D			-	=	M	]	m	}	Ź	Ł	ş	Ż	═	Ţ	Ý	ř
E			.	>	N	^	n	~	Ä	×	«	ż	╬	Ů	ţ	▪
F			/	?	O	_	o		Ć	č	»	┐	¤	■	’	

Cyrillic 1-855

ID 855

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	ђ	љ	а	▒	└	п	Я	-
1			!	1	A	Q	a	q	Ђ	Љ	А	▒	┴	П	р	ы
2			"	2	B	R	b	r	ѓ	њ	б	▒	┬	м	Р	Ы
3			#	3	C	S	c	s	Ѓ	Њ	Б	┤	├	М	с	з
4			$	4	D	T	d	t	ё	ћ	ц	┤	─	н	С	З
5			%	5	E	U	e	u	Ё	Ћ	Ц	х	┼	Н	т	ш
6			&	6	F	V	f	v	є	ќ	д	Х	к	о	Т	Ш
7			'	7	G	W	g	w	Є	Ќ	Д	и	К	О	у	э
8			(	8	H	X	h	x	s	ў	е	И	╚	п	У	Э
9			)	9	I	Y	i	y	S	Ў	Е	╣	╔	┘	ж	щ
A			*	:	J	Z	j	z	i	ц	ф	║	╩	┌	Ж	Щ
B			+	;	K	[	k	{	I	Ц	Ф	╗	╦	■	в	ч
C			,	<	L	\	l	|	ї	ю	г	╝	╠	■	В	Ч
D			-	=	M	]	m	}	Ї	Ю	Г	й	=	П	ь	·
E			.	>	N	^	n	~	j	ъ	«	Й	╬	я	Ь	▪
F			/	?	O	_	o		J	Ъ	»	┐	¤	■	№	

Cyrillic 2-866

ID 866

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	А	Р	а	▒	└	╨	р	Ё
1			!	1	A	Q	a	q	Б	С	б	▒	┴	╤	с	ё
2			"	2	B	R	b	r	В	Т	в	▓	┬	╥	т	Є
3			#	3	C	S	c	s	Г	У	г	│	├	╙	у	є
4			$	4	D	T	d	t	Д	Ф	д	┤	─	╘	ф	Ї
5			%	5	E	U	e	u	Е	Х	е	╡	┼	╒	х	ї
6			&	6	F	V	f	v	Ж	Ц	ж	╢	╞	╓	ц	Ў
7			'	7	G	W	g	w	З	Ч	з	╖	╟	╫	ч	ў
8			(	8	H	X	h	x	И	Ш	и	╕	╚	╪	ш	°
9			)	9	I	Y	i	y	Й	Щ	й	╣	╔	┘	щ	•
A			*	:	J	Z	j	z	К	Ъ	к	║	╩	┌	ъ	·
B			+	;	K	[	k	{	Л	Ы	л	╗	╦	█	ы	√
C			,	<	L	\	l	|	М	Ь	м	╝	╠	▄	ь	№
D			-	=	M	]	m	}	Н	Э	н	╜	=	▌	э	¤
E			.	>	N	^	n	~	О	Ю	о	╛	╬	▐	ю	▪
F			/	?	O	_	o		П	Я	п	┐	╧	▀	я	

Kamenicky (MJK)

ID 895

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	Č	É	á	▒	└	╨	α	≡
1			!	1	A	Q	a	q	ü	ž	í	▒	┴	╤	ß	±
2			"	2	B	R	b	r	é	Ž	ó	▒	┬	╥	Γ	≥
3			#	3	C	S	c	s	ď	ô	ú	┃	├	╙	π	≤
4			$	4	D	T	d	t	ä	ö	ň	┤	─	╘	Σ	⌠
5			%	5	E	U	e	u	Ď	Ó	Ň	┫	┼	╒	σ	⌡
6			&	6	F	V	f	v	Ť	ů	Ů	╢	╞	╓	µ	÷
7			'	7	G	W	g	w	č	Ú	Ô	╖	╟	╫	τ	≈
8			(	8	H	X	h	x	ě	ý	š	╕	╚	╪	Φ	°
9			)	9	I	Y	i	y	Ě	Ö	ř	╣	╔	┘	θ	•
A			*	:	J	Z	j	z	Ĺ	Ü	ŕ	║	╩	┌	Ω	·
B			+	;	K	[	k	{	Í	Š	Ŕ	╗	╦	█	δ	√
C			,	<	L	\	l	|	ľ	Ľ	¼	╝	╠	▄	∞	n
D			-	=	M	]	m	}	í	Ý	§	╜	═	▌	ϕ	2
E			.	>	N	^	n	~	Ä	Ř	«	╛	╬	▐	∈	▪
F			/	?	O	_	o		Á	ť	»	┐	╧	▀	∩	

ISO Latin 2

ID 1015

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				°	Ŕ	Đ	ŕ	đ
1			!	1	A	Q	a	q			Ą	ą	Á	Ń	á	ń
2			"	2	B	R	b	r			˘	˛	Â	Ň	â	ň
3			#	3	C	S	c	s			Ł	ł	Ă	Ó	ă	ó
4			$	4	D	T	d	t			¤	´	Ä	Ô	ä	ô
5			%	5	E	U	e	u			Ľ	ľ	Ĺ	Ő	Í	ő
6			&	6	F	V	f	v			Ś	ś	Ć	Ö	ć	ö
7			'	7	G	W	g	w			§	ˇ	Ç	×	ç	÷
8			(	8	H	X	h	x			¨	¸	Č	Ř	č	ř
9			)	9	I	Y	i	y			Š	š	É	Ů	é	ů
A			*	:	J	Z	j	z			Ş	ş	Ę	Ú	ę	ú
B			+	;	K	[	k	{			Ť	ť	Ë	Ű	ë	ű
C			‘	<	L	\	l	|			Ź	ź	Ě	Ü	ě	ü
D			-	=	M	]	m	}			-	˝	Í	Ý	í	ý
E			.	>	N	^	n	~			Ž	ž	Î	Ţ	î	ţ
F			/	?	O	_	o				Ż	ż	Ď	ß	ď	˙

Hebrew NC

ID 1030

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	א	נ	á	▒	└	╨	α	≡
1			!	1	A	Q	a	q	ב	ס	í	▒	┴	╤	ß	±
2			"	2	B	R	b	r	ג	ע	ó	▓	┬	╥	Γ	≥
3			#	3	C	S	c	s	ד	ף	ú	│	├	╙	π	≤
4			$	4	D	T	d	t	ה	פ	ñ	┤	─	╘	Σ	⌠
5			%	5	E	U	e	u	ו	ץ	Ñ	╡	┼	╒	σ	⌡
6			&	6	F	V	f	v	ז	צ	ª	╢	╞	╓	µ	÷
7			'	7	G	W	g	w	ח	ק	º	╖	╟	╫	τ	≈
8			(	8	H	X	h	x	ט	ר	¿	╕	╚	╪	Φ	°
9			)	9	I	Y	i	y	י	ש	⌐	╣	╔	┘	θ	•
A			*	:	J	Z	j	z	ך	ת	¬	║	╩	┌	Ω	·
B			+	;	K	[	k	{	כ	¢	½	╗	╦	█	δ	√
C			,	<	L	\	l	|	ל	£	¼	╝	╠	■	∞	n
D			-	=	M	]	m	}	ם	¥	¡	╜	═	▌	φ	2
E			.	>	N	^	n	~	מ	₧	«	╛	╬	▐	∈	▪
F			/	?	O	_	o		ן	ƒ	»	┐	╧	▀	∩	

Hebrew OC

ID 1031

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	א	נ	א	נ	á	▒	└	╨	α	≡
1			!	1	A	Q	ב	ס	ב	ס	í	▓	┴	╤	ß	±
2			"	2	B	R	ג	ע	ג	ע	ó	▓	┬	╥	Γ	≥
3			#	3	C	S	ד	ף	ד	ף	ú	┃	├	╙	π	≤
4			$	4	D	T	ה	פ	ה	פ	ñ	┤	─	╘	Σ	⌠
5			%	5	E	U	ו	ץ	ו	ץ	Ñ	╡	┼	╒	σ	⌡
6			&	6	F	V	ז	צ	ז	צ	ª	╢	╞	╓	µ	÷
7			'	7	G	W	ח	ק	ח	ק	º	╖	╟	╫	τ	≈
8			(	8	H	X	ט	ר	ט	ר	¿	╕	╚	╪	Φ	°
9			)	9	I	Y	י	ש	י	ש	⌐	╣	╔	┘	θ	•
A			*	:	J	Z	ך	ת	ך	ת	¬	║	╩	┌	Ω	·
B			+	;	K	[	כ	{	כ	¢	½	╗	╦	█	δ	√
C			,	<	L	\	ל	|	ל	£	¼	╝	╠	■	∞	n
D			-	=	M	]	ם	}	ם	¥	¡	╜	═	▌	ϕ	2
E			.	>	N	^	מ	~	מ	₧	«	╛	╬	▐	∈	▪
F			/	?	O	_	ן		ן	ƒ	»	┐	╧	▀	∩	

Turkey 857

ID 857

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	Ç	É	á	▒	└	º	Ó	–
1			!	1	A	Q	a	q	ü	æ	í	▓	┴	ª	ß	±
2			"	2	B	R	b	r	é	Æ	ó	▓	┬	Ê	Ô	
3			#	3	C	S	c	s	â	ô	ú	┃	├	Ë	Ò	¾
4			$	4	D	T	d	t	ä	ö	ñ	┤	─	È	õ	¶
5			%	5	E	U	e	u	à	ò	Ñ	Á	┼		Õ	§
6			&	6	F	V	f	v	å	û	Ğ	Â	ã	Í	µ	÷
7			'	7	G	W	g	w	ç	ù	ğ	À	Ã	Î		¸
8			(	8	H	X	h	x	ê	İ	¿	©	╚	Ï	×	°
9			)	9	I	Y	i	y	ë	Ö	®	╣	╔	┘	Ú	¨
A			*	:	J	Z	j	z	è	Ü	¬	╠	╩	┌	Û	·
B			+	;	K	[	k	{	ï	ø	½	╗	╦	▉	Ù	¹
C			,	<	L	\	l	▏	î	£	¼	╝	╠	■	ì	³
D			-	=	M	]	m	}	ı	Ø	¡	¢	=	¦	ÿ	²
E			.	>	N	^	n	~	Ä	Ş	«	¥	╬	Ì	¯	▪
F			/	?	O	_	o		Å	ş	»	┐	¤	■	´	

Latin 5 (Windows Turkey)

ID 1021

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				°	À	Ğ	à	ğ
1			!	1	A	Q	a	q		‘	¡	±	Á	Ñ	á	ñ
2			"	2	B	R	b	r		’	¢	²	Â	Ò	â	ò
3			#	3	C	S	c	s	*ƒ*	“	£	³	Ã	Ó	ã	ó
4			$	4	D	T	d	t	„	”	¤	´	Ä	Ô	ä	ô
5			%	5	E	U	e	u	…	•	¥	µ	Å	Õ	å	õ
6			&	6	F	V	f	v	†	—	¦	¶	Æ	Ö	æ	ö
7			'	7	G	W	g	w	‡	–	§	·	Ç	×	ç	÷
8			(	8	H	X	h	x	^	~	¨	¸	È	Ø	è	ø
9			)	9	I	Y	i	y	‰	™	©	¹	É	Ù	é	ù
A			*	:	J	Z	j	z	Š	š	ª	º	Ê	Ú	ê	ú
B			+	;	K	[	k	{	<	>	«	»	Ë	Û	ë	û
C			,	<	L	\	l	|	Œ	œ	¬	¼	Ì	Ü	ì	ü
D			-	=	M	]	m	}			–	½	Í	İ	í	ı
E			.	>	N	^	n	~			®	¾	Î	Ş	î	ş
F			/	?	O	_	o			Ÿ	¯	¿	Ï	ß	ï	ÿ

Windows Hebrew

ID 1032

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				°			א	נ
1			!	1	A	Q	a	q		‘	¡	±			ב	ס
2			"	2	B	R	b	r		’	¢	²			ג	ע
3			#	3	C	S	c	s	*ƒ*	“	£	³			ד	ף
4			$	4	D	T	d	t	„	”	¤	´			ה	פ
5			%	5	E	U	e	u	…	•	¥	µ			ו	ץ
6			&	6	F	V	f	v	†	—	¦	¶			ז	צ
7			'	7	G	W	g	w	‡	–	§	·			ח	ק
8			(	8	H	X	h	x			¨	¸			ט	ר
9			)	9	I	Y	i	y	‰	™	©	¹			י	ש
A			*	:	J	Z	j	z			×	÷			ך	ת
B			+	;	K	[	k	{	<	>	«	»			כ	
C			,	<	L	\	l	|			¬	¼			ל	
D			-	=	M	]	m	}				½			ם	
E			.	>	N	^	n	~			®	¾			מ	
F			/	?	O	_	o				¯			=	ן	

Ukrainian

ID 1027

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	А	Р	а	▒	└	╙	р	Ё
1			!	1	A	Q	a	q	Б	С	б	▒	┴	╤	с	ё
2			"	2	B	R	b	r	В	Т	в	▓	┬	╥	т	Ґ
3			#	3	C	S	c	s	Г	г	У	│	├	╙	у	ґ
4			$	4	D	T	d	t	Д	д	Ф	┤	─	╘	ф	Є
5			%	5	E	U	e	u	Е	Х	е	╡	┼	╒	х	є
6			&	6	F	V	f	v	Ж	Ц	ж	╢	╞	╓	ц	І
7			'	7	G	W	g	w	З	Ч	з	╖	╟	╫	ч	і
8			(	8	H	X	h	x	И	Ш	и	╕	╚	╪	ш	Ї
9			)	9	I	Y	i	y	Й	Щ	й	╣	╔	┘	щ	ї
A			*	:	J	Z	j	z	К	Ъ	к	║	╩	┌	ъ	
B			+	;	K	[	k	{	П	Ы	п	╗	╦	■	ы	
C			,	<	L	\	l	|	М	Ь	м	╝	╠	■	ь	№
D			-	=	M	]	m	}	Н	Э	н	╜	=	▮	э	
E			.	>	N	^	n	~	О	Ю	о	╛	╬	▮	ю	
F			/	?	O	_	o		П	Я	п	┐	╧	■	я	

Bulgarian

ID 1072

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	А	Р	а	р	└	▒	α	≡
1			!	1	A	Q	a	q	Б	С	б	с	┴	▒	ß	±
2			"	2	B	R	b	r	В	Т	в	т	┬	▒	Г	≥
3			#	3	C	S	c	s	Г	г	У	у	├	▒	π	≤
4			$	4	D	T	d	t	Д	д	Ф	ф	─	▒	Σ	⌠
5			%	5	E	U	e	u	Е	Х	е	х	┼	№	σ	⌡
6			&	6	F	V	f	v	Ж	Ц	ж	ц	╣	§	µ	÷
7			'	7	G	W	g	w	З	Ч	з	ч	║	╗	τ	≈
8			(	8	H	X	h	x	И	Ш	и	ш	╚	╝	Φ	°
9			)	9	I	Y	i	y	Й	Щ	й	щ	╔	┘	θ	•
A			*	:	J	Z	j	z	К	Ъ	к	ъ	╩	┌	Ω	·
B			+	;	K	[	k	{	П	Ы	п	ы	╦	█	δ	√
C			,	<	L	\	l	|	М	Ь	м	ь	╠	■	∞	n
D			-	=	M	]	m	}	Н	Э	н	э	═	▌	ϕ	2
E			.	>	N	^	n	~	О	Ю	о	ю	╬	▌	∈	▪
F			/	?	O	_	o		П	Я	п	я	┐	■	∩	

ISO Latin 6 (8859/10)

ID 1029

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				°	Ā	Đ	ā	ð
1			!	1	A	Q	a	q			Ą	ą	Á	Ņ	á	ņ
2			"	2	B	R	b	r			Ē	ē	Â	Õ	â	õ
3			#	3	C	S	c	s			Ģ	ģ	Ã	Ó	ã	ó
4			$	4	D	T	d	t			Ī	ī	Ä	Ô	ä	ô
5			%	5	E	U	e	u			Ĩ	ĩ	Å	Õ	å	õ
6			&	6	F	V	f	v			Ķ	ķ	Æ	Ö	æ	ö
7			'	7	G	W	g	w			§	̇	Į	Ũ	į	ũ
8			(	8	H	X	h	x			Ļ	ļ	Č	Ø	č	ø
9			)	9	I	Y	i	y			Đ	đ	É	Ų	é	ų
A			*	:	J	Z	j	z			Š	š	Ę	Ú	ę	ú
B			+	;	K	[	k	{			Ŧ	ŧ	Ë	Û	ë	û
C			,	<	L	\	l	|			Ž	ž	Ė	Ü	ė	ü
D			-	=	M	]	m	}				–	Í	Ý	í	ý
E			.	>	N	^	n	~			Ū	ū	Î	Þ	î	þ
F			/	?	O	_	o				Ŋ	ŋ	Ï	ß	ï	ĸ

Windows Baltic

ID 1034

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				°	Ą	Š	ą	š
1			!	1	A	Q	a	q		‘		±	Į	Ń	į	ń
2			"	2	B	R	b	r	‚	’	¢	²	Ą	Ņ	ą	ņ
3			#	3	C	S	c	s		”	£	³	Ć	Ó	ć	ó
4			$	4	D	T	d	t	„	“	¤		Ä	Ō	ä	ō
5			%	5	E	U	e	u	…	•		µ	Å	Õ	å	õ
6			&	6	F	V	f	v	†	—	¦	¶	Ę	Ö	ę	ö
7			'	7	G	W	g	w	‡	–	§	·	Ē	×	ē	÷
8			(	8	H	X	h	x			Ø	ø	Č	Ų	č	ų
9			)	9	I	Y	i	y	‰	™	©	¹	É	Ł	é	ł
A			*	:	J	Z	j	z			Ŗ	ŗ	Ź	Ś	ź	ś
B			+	;	K	[	k	{	<	>	«	»	Ė	Ū	ė	ū
C			,	<	L	\	l	|			¬	¼	Ģ	Ü	ģ	ü
D			-	=	M	]	m	}				½	Ķ	Ż	ķ	ż
E			.	>	N	^	n	~			®	¾	Ī	Ž	ī	ž
F			/	?	O	_	o				Æ	æ	Ļ	ß	ļ	

Baltic 774

ID 774

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	Ç	É	á	▒	└	ą	α	≡
1			!	1	A	Q	a	q	ü	æ	í	▓	┴	č	ß	±
2			"	2	B	R	b	r	é	Æ	ó	▓	┬	ę	Γ	≥
3			#	3	C	S	c	s	â	ô	ú	┃	├	ė	π	≤
4			$	4	D	T	d	t	ä	ö	ñ	┤	─	į	Σ	„
5			%	5	E	U	e	u	à	ò	Ñ	Ą	┼	š	σ	“
6			&	6	F	V	f	v	å	û	ª	Č	Ų	ų	µ	÷
7			'	7	G	W	g	w	ç	ù	ż	Ę	Ū	ū	τ	≈
8			(	8	H	X	h	x	ê	ÿ	¿	Ė	╚	ž	Φ	°
9			)	9	I	Y	i	y	ë	Ö	⌐	╣	╔	┘	θ	•
A			*	:	J	Z	j	z	è	Ü	¬	╠	╩	┌	Ω	·
B			+	;	K	[	k	{	ï	¢	½	╗	╦	▉	δ	√
C			,	<	L	\	l	|	î	£	¼	╝	╞	■	∞	ⁿ
D			-	=	M	]	m	}	ì	¥	¡	Į	═	▊	ϕ	²
E			.	>	N	^	n	~	Ä	₧	«	Š	╬	▊	∈	▪
F			/	?	O	_	o		Å	ƒ	»	┐	Ž	■	∩	

KBL Lithuanian

ID 1033

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	А	Р	а	▒	└	╨	р	Ę
1			!	1	A	Q	a	q	Б	С	б	▒	┴	╤	с	ę
2			"	2	B	R	b	r	В	Т	в	▓	┬	╥	т	Ė
3			#	3	C	S	c	s	Г	У	г	│	├	╙	у	ė
4			$	4	D	T	d	t	Д	Ф	д	┤	─	╘	ф	Į
5			%	5	E	U	e	u	Е	Х	е	┤	┼	╒	х	į
6			&	6	F	V	f	v	Ж	Ц	ж	╡	╞	╓	ц	Š
7			'	7	G	W	g	w	З	Ч	з	╖	╟	╫	ч	š
8			(	8	H	X	h	x	И	Ш	и	╕	╚	╪	ш	Ų
9			)	9	I	Y	i	y	Й	Щ	й	╣	╔	┘	щ	ų
A			*	:	J	Z	j	z	К	Ъ	к	║	╩	┌	ъ	Ū
B			+	;	K	[	k	{	Л	Ы	л	╗	╦	█	ы	ū
C			,	<	L	\	l	|	М	Ь	м	╝	╠	Ą	ь	Ž
D			-	=	M	]	m	}	Н	Э	н	╜	═	ą	э	ž
E			.	>	N	^	n	~	О	Ю	о	╛	╬	Č	ю	▪
F			/	?	O	_	o		П	Я	п	┐	╧	č	я	

Cyrillic Latvian

ID 1035

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	А	Р	а	▒	└	Š	р	Ē
1			!	1	A	Q	a	q	Б	С	б	▨	┴	┬	с	ē
2			"	2	B	R	b	r	В	Т	в	▓	┬	č	т	Ģ
3			#	3	C	S	c	s	Г	У	г	│	├	Č	у	ķ
4			$	4	D	T	d	t	Д	Ф	д	┤	─	┼	ф	Ķ
5			%	5	E	U	e	u	Е	Х	е	Ā	┼	╒	х	ļ
6			&	6	F	V	f	v	Ж	Ц	ж	╡	ā	ģ	ц	Ļ
7			'	7	G	W	g	w	З	Ч	з	ņ	╞	Ī	ч	ž
8			(	8	H	X	h	x	И	Ш	и	╕	╚	ī	ш	Ž
9			)	9	I	Y	i	y	Й	Щ	й	╣	╔	┘	щ	ō
A			*	:	J	Z	j	z	К	Ъ	к	╢	╩	┌	ъ	÷
B			+	;	K	[	k	{	Л	Ы	л	╖	╦	■	ы	±
C			,	<	L	\	l	|	М	Ь	м	╗	╠	■	ь	Ņ
D			-	=	M	]	m	}	Н	Э	н	Ō	═	ū	э	š
E			.	>	N	^	n	~	О	Ю	о	╝	╬	Ū	ю	▪
F			/	?	O	_	o		П	Я	п	┐	╧	■	я	

Roman 8

ID 1028

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	Ç	É		-	â	Å	Á	Þ
1			!	1	A	Q	a	q	ü	æ	À	Ý	ê	î	Ã	þ
2			"	2	B	R	b	r	é	Æ	Â	ý	ô	Ø	ã	·
3			#	3	C	S	c	s	â	ô	È	°	û	Æ	Đ	µ
4			$	4	D	T	d	t	ä	ö	Ê	Ç	á	å	ð	¶
5			%	5	E	U	e	u	à	ò	Ë	ç	é	í	Í	¾
6			&	6	F	V	f	v	å	û	Î	Ñ	ó	ø	Ì	–
7			'	7	G	W	g	w	ç	ù	Ï	ñ	ú	æ	Ó	¼
8			(	8	H	X	h	x	ê	ÿ	’	¡	à	Ä	Ò	½
9			)	9	I	Y	i	y	ë	Ö	‘	¿	è	ì	Õ	ª
A			*	:	J	Z	j	z	è	Ü	^	¤	ò	Ö	õ	º
B			+	;	K	[	k	{	ï	¢	¨	£	ù	Ü	Š	«
C			,	<	L	\	l	|	î	£	~	¥	ä	É	š	▪
D			-	=	M	]	m	}	ì	¥	Ù	§	ë	ï	Ú	»
E			.	>	N	^	n	~	Ä	₧	Û	*f*	ö	ß	Ÿ	±
F			/	?	O	_	o		Å	*f*	£	¢	ü	Ô	ÿ	

Icelandic 861

ID 861

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

Index

L

M

N

O

P

R

S

T

U

V

Z

OKI SYSTEMS COMPANIES

Oki Systems (UK) Limited
550 Dundee Road
Slough Trading Estate
Slough
Berks SL1 4LE

Tel: +44 (0) 1753 819 819
Fax: +44 (0) 1753 819 899

http://www.oki.co.uk

Oki Systems (Ireland) Limited
The Square Industrial Complex
Tallaght
Dublin 24

Tel: +353 (01) 459 8666
Fax: +353 (01) 459 8840

http://www.oki.ie

Hawthorn Business Centre
Adelaide Industrial Estate
Falcon Road
Belfast BT12 6HP

Tel: +44 (01232) 572 355
Fax: +44 (01232) 572 350

http://www.oki.ie