



USER'S MANUAL

XB24-250 II

DOT MATRIX PRINTERS

Trademark acknowledgments

IP-128XL, IS-8XL, LC-4511, LC-4521, PT-15XM, SF-15DM II, SPC-8K, XB-2425, XB24-250, XB24-250 II :
Star Micronics Co. Ltd.

LQ-850, LQ-860, LQ-1050, LQ-1060: Seiko Epson Corporation

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

MS-DOS: Microsoft Corporation

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About this manual

This manual describes how to set up, use, and care for the Star XB24-250 II printer. The following is a list of what you can expect to find in each chapter.

- Chapter 1** Choosing a place for your printer, unpacking and setup, ribbon cassette installation, loading paper, connecting to your computer
- Chapter 2** How to use the control panel
- Chapter 3** How to use the printer's Electronic DIP Switch (EDS) Mode to set up the printer to match the needs of your system and software
- Chapter 4** How to set up for printing with MS-DOS
- Chapter 5** Selecting the best type of paper, adjusting for paper thickness, manual sheet feeding, clearing paper jams
- Chapter 6** Optional accessories that are available for your printer
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Chapter 1: Printer Setup

This chapter contains important information on setting up your printer. Be sure to read this chapter carefully before using the printer for the first time. In this chapter you will learn about:

- Choosing a place for the printer
- Unpacking and setting up the printer
- Installing the platen knob
- Installing the ribbon cassette
- Loading paper
- Connecting to your computer

Choosing a place for the printer

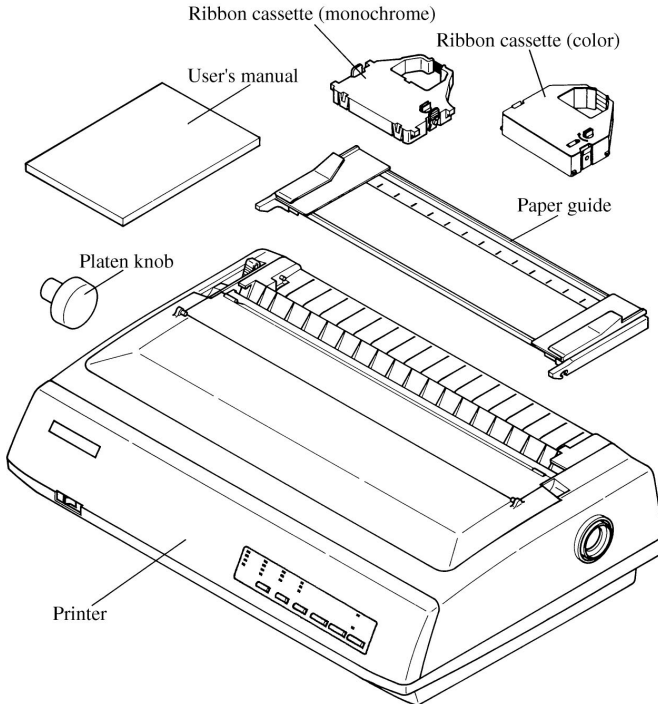
Before actually unpacking the printer, you should take a few minutes to think about where you plan to use it. Remember the following points when doing this.

- ✓ Choose a firm, level surface where the printer will not be exposed to vibration.
- ✓ The power outlet you plan to connect to for power should be nearby and unobstructed.
- ✓ Make sure that the printer is close enough to your computer for you to connect the two with your printer cable.
- ✓ Allow six inches (15 centimeters) of free space on either side of the printer. If you are going to use fanfold paper, make sure that there is adequate space for paper behind the printer.
- ✓ Make sure that the printer is not exposed to direct sunlight.
- ✓ Make sure that the printer is well away from heaters.
- ✓ Make sure that the surrounding area is clean, dry, and free of dust.
- ✓ Make sure that the printer is connected to a reliable power outlet. It should not be on the same electric circuit as copiers, refrigerators, or other appliances that cause power spikes.
- ✓ Use a power outlet that matches the power rating noted on the label affixed to the bottom of your printer.
- ✓ Make sure that the room where you are using the printer is not too humid.

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Unpacking the printer

Check to make sure that the carton contains each of the items shown in the following illustration.



If anything is missing, contact the store where you bought the printer and ask them to supply the missing part. Note that it is a good idea to keep the original box and all the packing materials just in case you need to pack the printer up again and send it somewhere at a later date.

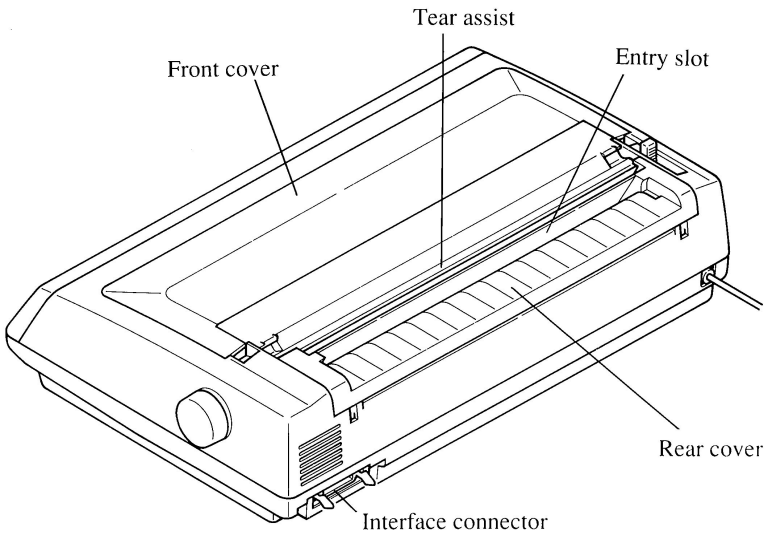
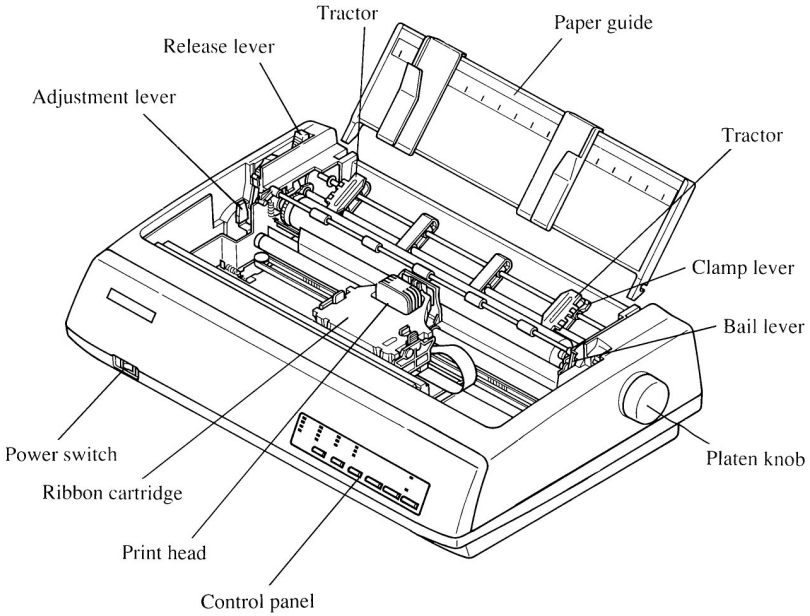
A serial-to-parallel interface converter (SPC-8K), a parallel interface unit (IP-128XL), a serial interface unit (IS-8XL), a pull tractor (PT-15XM), and an Automatic Sheet Feeder (SF-15DM II) are also available as options. Consult your dealer for details.

Important!

There are several versions of this printer designed for different voltages. It is not possible to change the voltage of a printer. If the voltage shown on the label on the bottom of your printer does not match the voltage for your area, contact your dealer immediately.

General guide

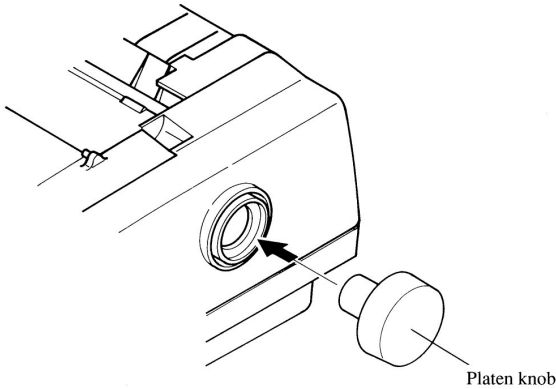
The following illustrations show the major components of the your printer.



Installing the platen knob

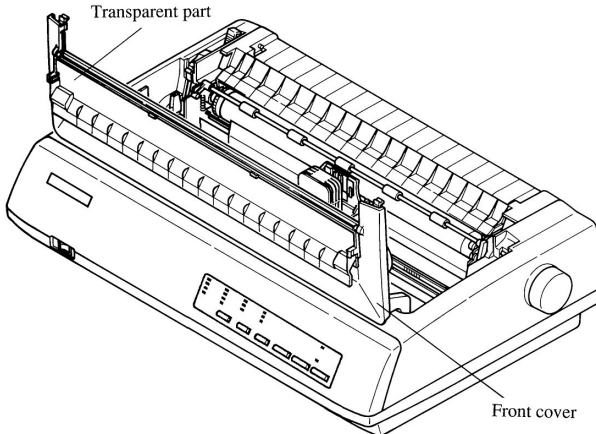
You can find the platen knob in the box of items that contains this manual.

- Install the knob on the shaft located inside the large hole on the right side of the printer. Make sure that the two metal pins on the platen shaft fit into the slots inside the knob's spindle. Press the knob carefully but firmly into place as far as it will go.



Opening the front cover

- Lift up on the front cover and swing it open until it stops.



- To close the front cover, simply lower it back into place.

Caution!

The tear assist edge is rather sharp. Take care to avoid injuring your hands.

Removing the front cover

Normally, you should leave the front cover connected to the printer, using the procedure described above to open and close it as required. You can also completely remove the front cover using the steps described below.

- Lift up on the front cover and swing it up until it is a little more than half way open.
- Carefully pull the front cover towards the back of the printer, moving it slightly up and down to work it free from the printer body.
- To replace the front cover, reverse the two steps described above.

Installing the ribbon cartridge

- Make sure that the printer is unplugged from its power outlet.

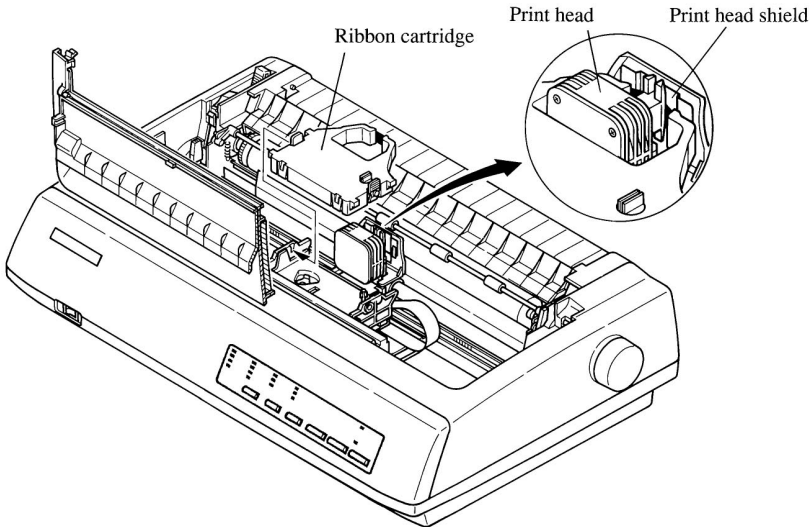
Caution!

Never touch the print head while the printer is turned on. Doing so can damage the printer. If you have just finished printing, let the print head cool for a few minutes before you touch it.

- Open the front cover of the printer.
- Remove the ribbon cartridge from its package.
- Rotate the knob on the ribbon cartridge clockwise to take up any slack in the ribbon.
- Carefully place the cartridge onto the cartridge holder making sure that the spindle of the holder fits into the socket on the bottom of the cartridge. Also

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make sure that the side tabs fit into the grooves on the sides of the cartridge holder.



- While guiding the ribbon between the print head and print head shield, press down gently on the cartridge until the side tabs snap securely into place.
- Rotate the knob on the cartridge again to take up any slack.
- Close the front cover of the printer.

Important!

Printing that is poor quality or too light is almost always due to a ribbon that is simply worn out or “used up.” If you experience problems with print quality, check the condition of the ribbon. If the black part looks gray and well-worn, replace the ribbon with a new one.

Removing the ribbon cartridge

Use the following procedure to remove the ribbon cartridge from the printer when you want to replace it with a new one.

- Make sure that the printer is unplugged from its power outlet.

Caution!

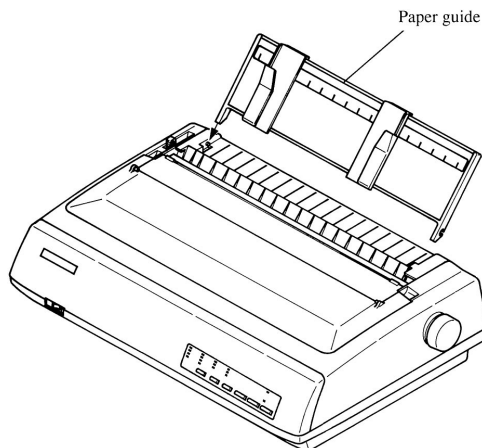
Never touch the print head while the printer is turned on. Doing so can damage the printer. If you have just finished printing, let the print head cool for a few minutes before you touch it.

- Open the front cover of the printer.
- Using your thumb and forefinger to squeeze the two tabs on the ribbon cartridge towards the center, carefully remove the cartridge from the holder.
- Use the procedure under “Installing the ribbon cartridge” on page 5 to install a new cartridge.

Installing the paper guide

You can find the platen knob in the box of items that contains this manual.

Insert the two pointed tabs on the bottom of the paper guide straight down into the holes provided on the top back of the printer, and then lay the paper guide down so the tabs inside the holes slip into the grooves on the paper guide tabs.



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- To remove the paper guide from the printer, stand it up while gently pulling it towards the front of the printer, Next carefully lift the paper guide straight up.

Adjusting the paper guide position

- The paper guide has two positions: raised and lowered. You can use either position for printing.
- To lower the paper guide, stand it up while gently pressing towards the back of the printer. Next, lift up slightly until the paper guide stops and then lay it down towards the back of the printer.
- To raise the paper guide, slowly stand it up until you feel it slide into a locked position.

Connecting to a power outlet and turning power on and off

- Plug the power cord of the printer into a standard power outlet whose voltage matches the power rating noted on the label affixed to the bottom of your printer.

Caution!

If the voltage marked on the bottom of your printer does not match the voltage from the outlet you are using, do not plug in the power cord. Contact your dealer for assistance.

- Set the switch on the front of the printer to ON to turn power on, and to OFF to turn power off.

Important!

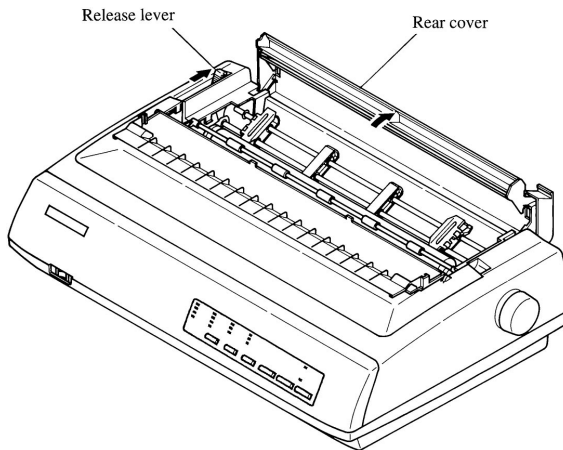
Whenever you turn off the power, wait for at least five seconds before turning it back on. Otherwise you may damage the printer. We also recommend that you unplug the printer from the power outlet whenever you do not plan to use it for long periods. Because of this, you should locate the printer so that the power outlet it is plugged into is nearby and easy to access.

At this point you may want to perform a test of the printer to make sure it is working properly. See “Testing the printer” on page 46 for details on how to perform tests.

Loading fanfold paper

This section tells you how to load fanfold paper. Note that you can also use cut-sheet paper and multi-part form paper. For details on using other types of paper, see “Paper Handling” on page 38 of this manual.

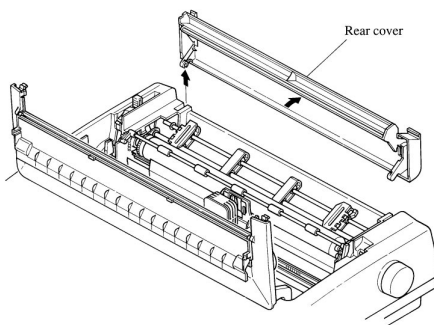
- Remove the paper guide from the printer.
- Position the stack of paper behind the printer.
- Make sure printer power is turned off.
- Set the release lever to the fanfold position.



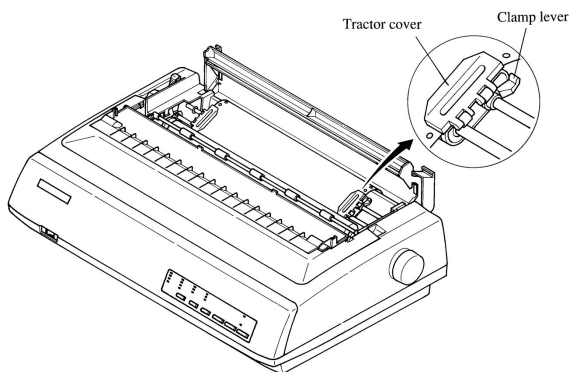
- Grasping the two back corners of the printer with the palms of your hands, lift up with your thumbs at the two thumb holds on either side of the rear cover until it opens. Allow the rear over to swing open as far as it will go.

Important!

You can also completely remove the rear cover by lifting it straight up from the printer while the cover is just past half way open.



- Pass the fanfold paper through the space between the printer case and the rear cover, with the side you want to print on facing down.
- Unlock the two tractors by pulling up their gray levers, and slide the tractors so they are aligned approximately with the holes on the sides of the paper. Press the gray levers back down to lock the tractors into place.
- Slide the center paper support into position so that it is approximately halfway between the two tractors.
- Open the covers of both tractors and insert the paper so the tractor pins fit.
- Close the tractor covers. At this point you can make final adjustments to the paper position by releasing the gray levers and sliding the tractors left and right. The paper should lie flat with no buckling or bulging (tractors too close) or no stretching or undue pulling on the holes (tractors too far apart). After making these adjustments, be sure that you re-lock the tractors by pressing the gray levers back into their original positions.



- Close the rear cover and press down gently on it until it locks into place with a click.

Install the paper guide so that it is standing up. In this position, the paper guide keeps the printed paper separate from the unprinted paper.

Turn on the printer.

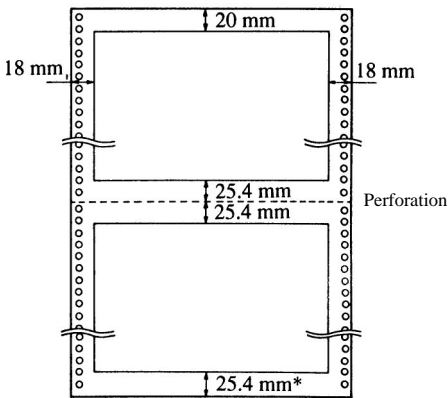
The printer will beep a number of times if paper is not loaded properly. Also, the control panel's **POWER** indicator flashes whenever paper is not loaded.

Press the **SET/EJECT/PARK** button to feed the paper to the starting position.

Printing on fanfold paper

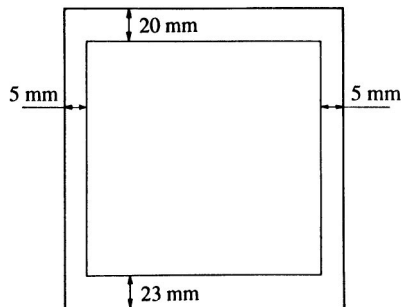
When printing on fanfold paper, take care not to print too close to the perforations that separate each sheet. The following shows the recommended print area for fanfold paper and cut-sheet paper.

Fanfold forms



(*80 mm for Push Feed)

Single sheets



Parking fanfold paper

It is not necessary to remove fanfold paper currently loaded in the printer in order to print on cut-sheet paper. Instead, simply use the following procedure to *park* the fanfold paper.

- Tear off the paper at a perforation so there is no more than half a page sticking out of the front cover of the printer.
If necessary, you can press the control panel's **ON LINE** button to put the printer off-line, and then use the **LINE FEED** button to feed the paper until a perforation is just past the front cover.
- Press the control panel's **ON LINE** button to put the printer off-line.
- Press the control panel's **SET/EJECT/PARK** button. The printer automatically reverse feeds the fanfold paper until it is no longer in contact with the platen, which is indicated by the printer beeping a number of times. Also, the control panel's **POWER** indicator starts to flash because paper is not loaded.
- Move the release lever to the cut-sheet position.
- Change the paper guide to its upright position.
You can now load cut-sheet paper into the printer using the procedures under "Manual sheet feeding" on page 40.

Unparking fanfold paper

After you are finished printing on cut-sheet paper, use the following procedure to unpark fanfold paper and make it available for printing.

- Remove all cut-sheet paper from the printer.
- Change the paper guide position so it is laying down flat.
- Move the release lever to the fanfold position.
- Press the **SET/EJECT/PARK** button to feed the paper to the starting position.
The printer automatically goes back on-line at this time.

Using the tear-off function

The following procedure makes it easy to tear off fanfold paper.

- Check to make sure that the printer is on-line.
- Press the **FORM FEED** button to perform the long tear-off operation, or press the **LINE FEED** button to perform the short tear-off operation.
The long tear-off operation causes the paper to be fed automatically so the tear assist edge of the printer cover is aligned with the paper's next perforation.

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The short tear-off operation causes the paper to be fed automatically so the tear assist edge of the printer cover is located just below the last line printed on the paper.

- Pull the paper against the tear assist edge to tear it off.

Connecting to your computer

The computer sends data to the printer through a cable. This printer does not come with a cable, so it is up to you to provide one. You will probably want to use a standard parallel cable for connection, but note that you can also use an optional serial-to-parallel interface converter (SPC-8K) or an optional interface cartridge (IS-8XL or IP-128XL).

Important!

The following instructions apply to the Centronics parallel cable that is used with an IBM-compatible personal computer. Note that they do not apply to all types of computers and cables. If you are unsure about what type of cable you should use to connect with your computer, consult your dealer.

For an IBM-compatible personal computer:

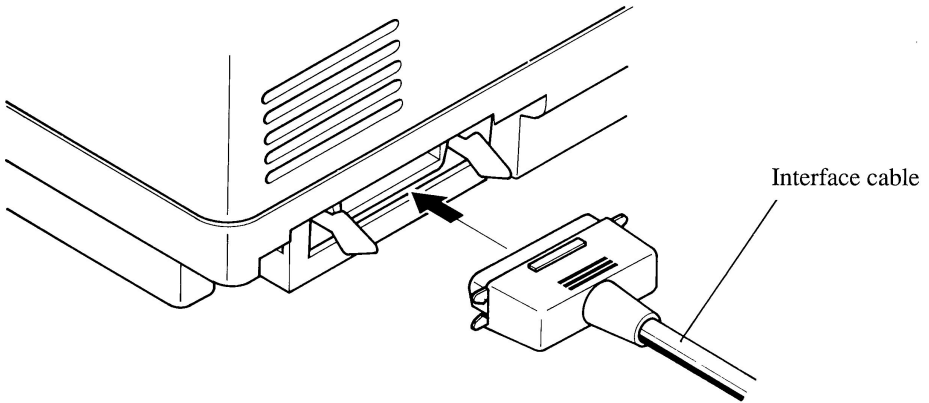
- ✓ Use a standard 36-pin Centronics parallel cable.
- ✓ The parallel cable should be no longer than six feet (two meters). Longer cables can result in poor transfer of information.

Important!

Make sure that the printer and the computer are turned off before connecting them.

- Plug one end of the parallel cable into the parallel port of your computer. The parallel port should be labeled “Printer,” “Parallel,” “PRN,” “LPT1,” or something similar.

- ❑ Plug the other end of the parallel cable into the socket on the back of the printer and secure it in place with the clips.

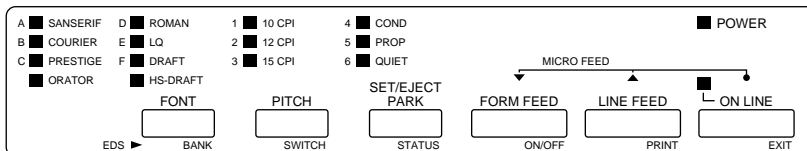


Note:

Consult your dealer for details on how to set up your computer when using the optional SPC-8K serial-to-parallel interface converter, the IP-128XL parallel interface unit or the IS-8XL serial interface unit.

Chapter 2: Control Panel Operations

The control panel gives you push-button control over the printer's operations. It includes indicator lights, which tell you the current status of the printer at a glance.



This chapter describes control panel functions that can be performed while the printer is turned on and either on-line or off-line. The buttons perform different functions in the EDS and Dot Adjustment Modes. Functions of control panel buttons in these modes are described in the relevant sections covering them.

Switching between on-line and off-line

- Press **ON LINE** to switch the printer between being on-line and off-line.
- When the printer is on-line, the **ON LINE** indicator is lit and the printer can receive data from the computer. You should make sure that the printer is on-line whenever you are trying to print.
- When the printer is in off-line, the **ON LINE** indicator goes out, which means that the printer cannot receive any data.
- Note that you can also press **ON LINE** while a printing operation is in progress to stop the printing.

Important!

Make sure that the on-line/off-line setting of the printer is correct before performing a control panel operation.

Selecting a font

- Make sure the printer is off-line (**ON LINE** indicator is not lit).
- Press **FONT** to change the font selection. An indicator lights to the left of the name of the font that is currently selected.

Lit Indicator	Font
LQ + ROMAN	Roman
LQ + SANSERIF	Sanserif
LQ + COURIER	Courier
LQ + PRESTIGE	Prestige
LQ + ORATOR	Orator
LQ	OCR-B
HS-DRAFT	HS-Draft
DRAFT	Draft

Note:

The font setting you make with the above procedure can be changed if the software you are using overrides the setting on the control panel. You can prevent this by using the following procedure to put the printer into the Font Lock Mode when you turn it on.

Entering the Font Lock Mode

When the printer is in the Font Lock Mode, the font settings you make on the control panel are used even if your software tries to override the font. Use the following procedure to enter the Font Lock Mode.

- Turn off the printer.
- While holding down **FONT**, turn printer power on.

The printer is now in the Font Lock Mode. You could enter the Font Lock Mode and Pitch Lock Mode (page 18) at the same time by holding down both **FONT** and **PITCH** when you turn on printer power.

To exit the Font Lock Mode, simply turn the printer off.

Setting the character pitch

The character pitch setting controls how many characters are printed per inch. Use the following procedure to select the pitch you want.

- Make sure the printer is off-line (**ON LINE** indicator is not lit).
- Press **PITCH** to change the pitch selection.

The following shows the meanings of the indicators that light on the control panel when you press **PITCH**.

Lit Indicators	Meaning
10CPI	10 characters per inch (Pica)
12CPI	12 characters per inch (Elite)
15CPI	15 characters per inch
10CPI + COND	17 characters per inch (Condensed Pica)
12CPI + COND	20 characters per inch (Condensed Elite)
PROP	Proportional
COND+PROP	Condensed proportional

Note:

The pitch setting you make with the above procedure can be changed if the software you are using overrides the setting from the control panel. You can prevent this by using the following procedure to put the printer into the Pitch Lock Mode when you turn it on.

Entering the Pitch Lock Mode

When the printer is in the Pitch Lock Mode, the pitch settings you make on the control panel are used even if your software tries to override the pitch. Use the following procedure to enter the Pitch Lock Mode.

- Turn off the printer.
- While holding down **PITCH**, turn printer power on.

The printer is now in the Pitch Lock Mode. You could enter the Pitch Lock Mode and Font Lock Mode (page 17) at the same time by holding down both **FONT** and **PITCH** when you turn on printer power.

To exit the Pitch Lock Mode, simply turn the printer off.

Line feed

- Make sure the printer is off-line (**ON LINE** indicator is not lit).
- Press **LINE FEED** once to feed paper one line. Holding down **LINE FEED** continually feeds paper, one line at a time, until you release the button.

Paper eject (cut-sheet paper)

- Make sure the printer is off-line (**ON LINE** indicator is not lit).
- Press **SET/EJECT/PARK** to eject the paper.
- After the paper is ejected, the printer will beep and the **POWER** indicator will flash to indicate there is no paper in the printer.

Form feed (fanfold paper)

- Make sure the printer is off-line (**ON LINE** indicator is not lit).
- Press **FORM FEED** and the printer will automatically feed the paper to the top of the next page.

Parking fanfold paper

- Make sure the printer is off-line (**ON LINE** indicator is not lit).
- Press the control panel's **SET/EJECT/PARK** button.
- The printer automatically reverse feeds the fanfold paper until it is no longer in contact with the platen.

Micro feed

Use the following operation to feed the paper in very small increments. This makes it possible to align the print head exactly where you want it.

- Make sure the printer is off-line (**ON LINE** indicator is not lit).
- While holding down **ON LINE**, press **LINE FEED** to feed the paper forward or **FORM FEED** to feed the paper backward.

Setting the top of form position

The current position of paper loaded in the printer is automatically set as the top of the page whenever you turn power on. You can also use the following procedure at any time to specify a different position as the top of the page.

- Make sure the printer is off-line (**ON LINE** indicator is not lit).
- Use the micro feed operations (see above) to move the paper so that the print head is located where you want the new top of form position to be.
- While holding down **FONT**, press **SET/EJECT/PARK**.

The printer will beep once to indicate that a new top of form position has been set.

Tear-off function (fanfold paper)

This procedure feeds fanfold paper to a position where it can be torn off easily.

- Check to make sure that the printer is on-line.
- Press the **FORM FEED** button to perform the long tear-off operation, or press the **LINE FEED** button to perform the short tear-off operation.

The long tear-off operation causes the paper to be fed automatically so the tear assist edge of the printer cover is aligned with the paper's next perforation.

The short tear-off operation causes the paper to be fed automatically so the tear assist edge of the printer cover is located just below the last line printed on the paper.

- Pull the paper against the tear assist edge to tear it off.
- When you resume printing, the printer reverse feeds the paper to its former position.

Selecting the Quiet Print Mode

The Quiet Print Mode lets you print with less noise than that produced with normal printing. Use the following procedure to enter and exit the Quiet Print Mode.

Important!

Though the Quiet Print Mode prints more quietly, it also causes printing to take considerably longer than normal printing.

- Make sure the printer is on-line (**ON LINE** indicator is lit).
- Press **SET/EJECT/PARK**, to toggle between the Quiet Print Mode and normal printing.
The printer emits one short beeps when the Quiet Print Mode is selected, and two short beep when normal printing is selected.

Changing the auto load position

Normally the printer automatically feeds paper to a standard position (1/6-inch from the top of the paper). This is called the auto load position. You can use the following procedure to specify a different auto load position.

- Make sure the printer is off-line (**ON LINE** indicator is not lit).
- While holding down **ON LINE**, press **SET/EJECT/PARK** and then release the two buttons.
The printer will automatically eject the cut-sheet that is in the printer, or reverse feed fanfold paper until it is no longer in contact with the platen. Also, all the font and pitch indicators on the control panel will light.
- Press **SET/EJECT/PARK** to feed the paper to the starting position.
- Feed the paper so the print head is located where you want the new auto load position to be.
Press **LINE FEED** to feed the paper forward and **FORM FEED** to feed the paper backward. This is the micro feed operation.
- After you have the paper at the position you want, hold down **ON LINE** and press **LINE FEED** to make the current print head position the new auto load position. The printer will beep twice to indicate that the new auto load position is set.
- To clear the new auto load position and return to the one that you set previously (using the above procedure), press **ON LINE**. To clear the currently set auto load position and return to the standard position (1/6-inch from the top of the paper), hold down **ON LINE** and press **SET/EJECT/PARK**.

Note:

The auto load position you set remains in effect until you turn the printer off. If you want to save the auto load position in memory, press FORM FEED instead of LINE FEED while holding down ON LINE in the above step.

Saving a macro

Normally, any settings you make on the control panel are cleared when you turn the printer off. Use the following procedure to save the current control panel settings so that they are used whenever you turn the printer on.

- Make the control panel settings you want.
- Use **ON LINE** to put the printer off-line (**ON LINE** indicator is not lit).
- Hold down **FONT** and then **PITCH**. Keep both buttons held down until the printer beeps twice.

Pressing **FONT** normally changes the font setting, so when you press it in the above step the indicator for the next font lights. Pressing **PITCH**, however, returns the font setting to what it was before you pressed **FONT**.

This procedure saves the following settings.

- Current font and pitch settings
- Quiet Print Mode status

These items can be set separately for the Standard mode and the IBM mode.

- To clear saved control panel settings repeat the above procedure, but keep **FONT** and **PITCH** depressed after the printer beeps twice. Soon the printer will beep again three times to indicate that the saved control panel settings have been cleared.

Clearing the printer's buffer

When the printer receives data from a computer, it temporarily stores it in a memory called a buffer. If you stop a printing job partway through, there is the chance that some data will remain in the buffer. The following procedure clears the printer's buffer by deleting any data that might be there.

- Execute the necessary command in the program you are using to stop the print job.

Important!

Be sure to stop the print job before taking the printer off line. Otherwise, the print job will resume from where you interrupted it when you put the printer back on-line.

- Use **ON LINE** to take the printer off line (**ON LINE** indicator is not lit).
- Hold down **FONT** and then **FORM FEED**. Keep both buttons held down until the printer beeps once, which indicates that the buffer is cleared.

Initializing the printer

The following procedure initializes the printer to its power-on settings. If you have control panel settings stored in memory, this procedure sets up the printer using them.

- Use **ON LINE** to take the printer off line (**ON LINE** indicator is not lit).
- Hold down **FONT** and then **FORM FEED**. Keep both buttons held down until the printer beeps once (indicating the printer buffer is cleared) and then beeps again three times, which indicates that the printer is reset.

Entering the Multi-part Mode

When the printer is in the Multi-part Mode, the print head prints with greater impact. It should be noted, however, that printing in the Multi-part Mode also reduces the life of the print head. Because of this, you should use the Multi-part Mode only for printing on four or five-ply paper. Return to the normal mode for printing on one to three-ply paper.

Use the following procedure to enter the Multi-part Mode

- Turn off the printer.
- While holding down the control panel's **SET/EJECT/PARK** button, turn the printer back on.
- To exit the Multi-part Mode, Simply turn the printer off and back on again.

Chapter 3: Using the EDS Mode

The letters “EDS” stand for “Electronic DIP Switches.” Just like the small DIP switches that are used by many computers, printers, and other devices, the EDS mode lets you configure the printer so that it matches your system and software needs. This chapter describes how to enter the printer’s EDS Mode and provides details about available settings and how to change them.

All switch settings are ON when the printer is shipped from the factory.

About EDS Mode settings

EDS Mode settings are grouped among six “banks” (representing banks of switches) that are identified by the letters A through F. Each bank contains a number of “switches” numbered 1 through 6 that you can turn on and off to configure the printer.

Entering the EDS Mode

- Make sure that paper is loaded in the printer.
- Turn off the printer.
- While holding down the control panel’s **ON LINE**, **LINE FEED**, and **FORM FEED** buttons, turn the printer back on.

This causes the following message to be printed, which indicates the printer is in the EDS Mode.

CURRENT EDS SETTINGS

Bank	A	B	C	D	E	F
Switch	123456	123456	123456	123456	123456	123456
ON	*****	*****	*****	*****	*****	*****
OFF						

Selecting a bank

- ❑ While in the EDS Mode, use the control panel's **BANK** button to select a bank. When the **BANK** indicator flashes it indicates the current bank selected.

Lit Indicator	Selected Bank
A (SANSERIF)	A
B (COURIER)	B
C (PRESTAGE)	C
D (ROMAN)	D
E (LQ)	E
F (DRAFT)	F

Selecting a switch

- ❑ While in the EDS Mode, use the control panel's **SWITCH** button to select a bank switch. When the **SW** indicator flashes it indicates the current switch selected.

Lit Indicator	Selected Switch
1 (10CPI)	1
2 (12CPI)	2
3 (15CPI)	3
4 (COND)	4
5 (PROP)	5
6 (QUIET)	6

Changing a switch setting

- ❑ After selecting a bank and switch, press the control panel's **ON/OFF** button to turn the switch on and off. The current setting of the switch is indicated by the **ON LINE** indicator: the indicator is lit when the switch is on, and is not lit when the switch is off.

Printing the current switch settings

- In the EDS Mode, press the control panel's **PRINT** button to print out the current switch settings. Asterisks on the printout show whether a switch is turned on or off.

Checking the settings of switches in a bank

- After selecting a bank, press the control panel's **STATUS** button to view the status of each switch in that bank. The control panel's font indicator is lit when the switch is on, and is not lit when the switch is off.

Lit Indicator	Selected Switch
1 (10CPI)	1
2 (12CPI)	2
3 (15CPI)	3
4 (COND)	4
5 (PROP)	5
6 (QUIET)	6

Exiting the EDS Mode

- Press the control panels **EXIT** button to exit the EDS Mode.

EDS Mode Settings

The following details all of the settings you can program in the EDS Mode. You can print out a detailed overview of all the settings by performing a test of the printer (page 46).

BANK A

Switch 1: Emulation

Selects Standard emulation (ON) or IBM emulation (OFF). Standard emulation causes the printer to act like the Epson ESC/P (24-pin), while IBM emulation makes it act like the IBM Proprinter XL24E.

Switch 2: Character Table

The function of this switch depends on whether you are using IBM or Standard emulation.

Emulation	Switch 2 Setting	Description
Standard	ON	Graphics: IBM Character Set #2
	OFF	Italics: Italic character table used
IBM	ON	IBM Character Set #2
	OFF	IBM Character Set #1

Switch 3: RAM Usage

Specifies whether RAM should be used as an input buffer (ON) or as a download buffer (OFF). Selecting input buffer (ON) tells the printer to use available RAM to store data it receives from the computer, which speeds up the printing. Selecting download buffer (OFF) tells the printer to use available RAM to store character patterns.

Switch 4: Automatic Sheet Feeder

Specifies whether the optional SF-15DM II Automatic Sheet Feeder is installed (OFF) or not installed (ON).

Switch 5: Paper Out Detector

Specifies whether the printer's paper out detector is enabled (ON) or disabled (OFF). When the paper out detector is enabled (ON), the printer automatically stops printing whenever it senses there is no more paper. When it is disabled (OFF), the printer continues printing as long as there is data. Selecting disabled (OFF) makes it possible to print right up to the bottom of a page, but it also creates the danger of printing when there is no paper loaded in the printer, which can damage the print head and platen.

Switch 6: Multi-Part Mode

Specifies whether the printer's Multi-Part Mode is enabled (OFF) or disabled (ON). When the Multi-Part Mode is enabled (OFF), the impact of the print head is increased, but head life is decreased. Enable the Multi-Part Mode when printing on four to five-ply paper. Disable the Multi-Part Mode when printing on 1 to 3-ply paper.

BANK B

Switch 1: Graphics Direction

Selects uni-directional (OFF) or bi-directional (ON) printing for graphics. Bi-directional printing (ON) is faster, while uni-directional (OFF) printing generally provides better print quality in the graphics mode.

Switch 2: Auto Tear-off (Long)

Specifies whether the printer's auto tear-off (long) feature (page 20) is enabled (OFF) or disabled (ON). Note that this setting controls the application software's tear-off function only. It does not affect the manual tear-off function that is performed using the control panel buttons as described on page 13. The manual tear-off function is always enabled.

Switch 3: Line Spacing

Selects 1/6-inch (ON) or 1/8-inch (OFF) spacing between lines.

Switch 4: Auto LF with CR

Specifies whether auto LF with CR is enabled (OFF) or disabled (ON). When auto LF with CR is enabled (OFF), the printer automatically performs a line feed whenever it receives a carriage return from the computer. When it is disabled (ON), the computer must send both a line feed code and a carriage return code at the end of each line. Most applications do this automatically. Note the following check points when trying to figure out which setting to use here:

- ✓ If you find that your output is double-spaced when it should not be, turn this switch ON (Disabled).
- ✓ If you find that lines are printing over each other, turn this switch OFF (Enabled).

Switch 5: Zero Style

Specifies whether a normal zero (ON) or a slashed zero (OFF) will be used. Selecting Normal (ON) prints zeros without lines running through them, while Slashed (OFF) prints zeros with a diagonal slash running through them.

Switch 6: Reserved

BANK C**Switches 1, 2: Print Mode**

Turn these switches on or off to select the print mode you want to use.

Print Mode	SW1	SW2
LQ	ON	ON
Draft	OFF	ON
HS-Draft	ON	OFF

Switches 3, 4, 5: Print Pitch

Turn these switches on or off to form the pattern that matches the print pitch setting you want to make.

Print Pitch	SW3	SW4	SW5
10cpi	ON	ON	ON
12cpi	OFF	ON	ON
15cpi	ON	OFF	ON
17cpi	OFF	OFF	ON
20cpi	ON	ON	OFF
Proportional	OFF	ON	OFF

Switch 6: Quiet

When the Quiet Mode is enabled (OFF), the printer prints with less noise than normal printing. Though the Quiet Mode prints more quietly, it also takes considerably longer than normal printing.

BANK D**Switches 1, 2, 3, 4: Page Length**

Turn these switches on or off to form the pattern that matches the Page Length setting you want to use.

Page Length	SW1	SW2	SW3	SW4
11"/Letter	ON	ON	ON	ON
8"	OFF	ON	ON	ON
11.7"/A4	ON	OFF	ON	ON
12"	OFF	OFF	ON	ON
8.5"/Letter	ON	ON	OFF	ON
14"/Legal	OFF	ON	OFF	ON
10.5"/Executive	ON	OFF	OFF	ON
7.25"/Executive	OFF	OFF	OFF	ON
3.5"	ON	ON	ON	OFF
5.5"	OFF	ON	ON	OFF

Switch 5: CR Centering Position

If you set this switch OFF, the carriage moves to the center each time to feed paper near the perforation. This way, you can get better quality of printing around the perforations. It is recommended to match the page length setting to your fanfold paper, otherwise, this function does not work properly at the perforations.

If you leave this switch ON, the carriage does not move when feeding paper.

Switch 6 : Not used**BANK E****Switches 1, 2, 3, 4, 5: Code Page/International Character Set**

If your EDS settings specify IBM emulation (Bank A, Switch 1 OFF) with either character table (Bank A, Switch 2), or Standard emulation (Bank A, Switch 1 ON) with the graphics character table (Bank A, Switch 2 ON), use the Bank E switches to select the default character code page you want to use.

Code Page	SW1	SW2	SW3	SW4	SW5	SW6
#437 IBM-PC	ON	ON	ON	ON	ON	ON
#850 Multi-lingual	OFF	ON	ON	ON	ON	ON
#860 Portuguese	ON	OFF	ON	ON	ON	ON
#861 Icelandic	OFF	OFF	ON	ON	ON	ON
#863 Canadian French	ON	ON	OFF	ON	ON	ON
#865 Nordic	OFF	ON	OFF	ON	ON	ON
#866 Russian	ON	OFF	OFF	ON	ON	ON
#3840 IBM-Russian	OFF	OFF	OFF	ON	ON	ON
#3841 Gost-Russian	ON	ON	ON	OFF	ON	ON
#3843 Polish	OFF	ON	ON	OFF	ON	ON
#3844 CS2	ON	OFF	ON	OFF	ON	ON
#3845 Hungarian	OFF	OFF	ON	OFF	ON	ON
#3846 Turkish	ON	ON	OFF	OFF	ON	ON
#3847 Brazil-ABNT	OFF	ON	OFF	OFF	ON	ON
#3848 Brazil-ABICOMP	ON	OFF	OFF	OFF	ON	ON
#852 Latin-2	OFF	OFF	OFF	OFF	ON	ON
#1001 Arabic	ON	ON	ON	ON	OFF	ON
#737 Greek	OFF	ON	ON	ON	OFF	ON
#851 Greek	ON	OFF	ON	ON	OFF	ON
#869 Greek	OFF	OFF	ON	ON	OFF	ON
#928 Greek	ON	ON	OFF	ON	OFF	ON
#2001 Lithuanian-KBL	OFF	ON	OFF	ON	OFF	ON
#772 Lithuanian	ON	OFF	OFF	ON	OFF	ON
#774 Lithuanian	OFF	OFF	OFF	ON	OFF	ON
#3001 Estonian-1	ON	ON	ON	OFF	OFF	ON
#3002 Estonian-2	OFF	ON	ON	OFF	OFF	ON
#3011 Latvian-1	ON	OFF	ON	OFF	OFF	ON
#3012 Latvian-2	OFF	OFF	ON	OFF	OFF	ON
#3021 Bulgarian	ON	ON	OFF	OFF	OFF	ON
#3031 Hebrew	OFF	ON	OFF	OFF	OFF	ON
#3041 Maltese	ON	OFF	OFF	OFF	OFF	ON

Code Page	SW1	SW2	SW3	SW4	SW5	SW6
#3850 Standard KU	OFF	OFF	OFF	OFF	OFF	ON
#3860 Rajvitee KU	ON	ON	ON	ON	ON	OFF
#3861 Microwiz KU	OFF	ON	ON	ON	ON	OFF
#3863 STD 988 TIS	ON	OFF	ON	ON	ON	OFF
#3864 Popular TIS	OFF	OFF	ON	ON	ON	OFF
#3865 Newsic TIS	ON	ON	OFF	ON	ON	OFF

A code page is the set of symbols and characters that your printer can print. Your printer converts ASCII hexadecimal data according to a code page to print symbols and characters. By supporting different code pages, the printer can print in a variety of different languages. The following table shows detailed information about code pages.

Code Page	Name	Country	Remarks
#437	IBM PC	United Kingdom, France, Germany, Italy, Austria, Switzerland, United States, Spain	
#850	Multi-Lingual	United Kingdom, France, Germany, Italy, Austria, Switzerland, United States, Spain	Preferred by Microsoft
#860	Portuguese	Portugal	
#861	Icelandic	Iceland	
#863	Canadian French	Canada	
#865	Nordic	Denmark, Finland, Norway, Sweden	Preferred by Microsoft
#866	Russian	Russia	Preferred by Microsoft
#3840	IBM-Russian	Russia, Bulgaria	
#3841	Gost-Russian	Russia	Gost: government standard
#3843	Polish	Poland	Also called "Mazowia"
#3844	CS2	Czech Republic	Also called "Kamenicky"
#3845	Hungarian	Hungary	
#3846	Turkish	Turkey	
#3847	Brazil-ABNT		
#3848	Brazil-ABICOMP		
#852	Latin-2	Croatia, Czech Republic, Hungary, Poland, Romania, Serbia, Slovak Republic, Slovenia	Preferred by Microsoft
#1001	Arabic	Egypt, Saudi Arabia	Mainly in Arabic speaking countries
#737	Greek	Greece	Almost 80%
#851	Greek	Greece	

Code Page	Name	Country	Remarks
#869	Greek	Greece	
#928	Greek	Greece	For UNIX
#2001	Lithuanian-KBL	Lithuania	Commonly used for DOS
#772	Lithuanian	Lithuania	New standard
#774	Lithuanian	Lithuania	
#3001	Estonian-1	Estonia	
#3002	Estonian-2	Estonia	Most often used
#3011	Latvian-1	Latvia	
#3012	Latvian-2	Latvia	Government standard
#3021	Bulgarian	Bulgaria	
#3031	Hebrew	Israel	
#3041	Maltese	Malta	
#3850	Standard KU	Thailand	
#3860	Rajvitee KU	Thailand	
#3861	Microwiz KU	Thailand	
#3863	STD988 TIS	Thailand	
#3864	Popular TIS	Thailand	
#3865	Newsic TIS	Thailand	

If your EDS settings specify Standard emulation (Bank A, Switch 1 ON) with the italic character table (Bank A, Switch 2 OFF), use the Bank E switches to select the international character set you want to use. This setting determines the assignment of 14 character codes in the Standard Italic character set.

International Character Set	SW1	SW2	SW3	SW4	SW5	SW6
U.S.A.	ON	ON	ON	ON	ON	ON
France	OFF	ON	ON	ON	ON	ON
Germany	ON	OFF	ON	ON	ON	ON
England	OFF	OFF	ON	ON	ON	ON
Denmark-1	ON	ON	OFF	ON	ON	ON
Sweden	OFF	ON	OFF	ON	ON	ON
Italy	ON	OFF	OFF	ON	ON	ON
Spain-1	OFF	OFF	OFF	ON	ON	ON
Japan	ON	ON	ON	OFF	ON	ON
Norway	OFF	ON	ON	OFF	ON	ON
Denmark-2	ON	OFF	ON	OFF	ON	ON
Spain-2	OFF	OFF	ON	OFF	ON	ON
Latin America	ON	ON	OFF	OFF	ON	ON
Korea	OFF	ON	OFF	OFF	ON	ON
Ireland	ON	OFF	OFF	OFF	ON	ON
Legal	OFF	OFF	OFF	OFF	ON	ON

BANK F**Switches 1, 2, 3, 4, 5: LQ Font Selection**

Turn these switches on or off to form the pattern that identifies the font you want to use for LQ printing.

Font	SW1	SW2	SW3	SW4	SW5
Roman	ON	ON	ON	ON	ON
Sanserif	OFF	ON	ON	ON	ON
Courier	ON	OFF	ON	ON	ON
Prestige	OFF	OFF	ON	ON	ON
OCR-B	OFF	ON	OFF	ON	ON
Orator	OFF	OFF	OFF	ON	ON

Note:

Bank C switches 1 and 2 need to be in the correct positions before the above setting will have any effect.

Switch 6: Not used

Chapter 4: Using the Printer with MS-DOS

This chapter contains information about how to use the printer with applications software running under MS-DOS. In this chapter, you will learn about:

- How to set up for printing with MS-DOS

Setting up for printing with MS-DOS

To print from an application running under MS-DOS, you must first select the printer from within the application. Typically, the program will feature an **INSTALL** or **SETUP** command for selection of printers. Refer to the manual for the application you are using for details on how to select a printer for it.

- Start up the application and use the correct procedure for that application to select a printer. The following is a list of printers that can be used. If your application lists more than one of these, select the printer that is nearest to the top of this list. You should also use the EDS mode or User Setup Utility to select Standard emulation (page 27).

Star XB24-250 II
Star XB24-250/XB-2425
Star LC-4511/4521
Epson LQ-860/1060
Epson LQ-850/1050

If none of the printers listed above are available in the application, choose one of the printers listed below. Once again, you should choose the printer that is nearest to the top in the following list. For these printers, you should use the EDS Mode or User Setup Utility to select IBM emulation (page 27).

IBM Proprinter X24E/XL24E
IBM Proprinter X24/XL24

- To print, follow the instructions given in the manual of the application you are using. Typically, you would select the application's **PRINT** command, make any necessary changes in the window that appears (such as the number of copies to be printed), and then press the **Enter** key to start printing.

Chapter 5: Paper Handling

Your printer is designed to print on a variety of paper types. This chapter tells you everything you need to know about paper, and how to set the printer up for manual paper feed. In this chapter, you will learn about:

- Selecting the best type of paper
- Adjusting for paper thickness
- Manual sheet feeding
- Clearing paper jams

Selecting paper types

Use the following information when selecting paper. Note that printing is supported for both portrait and landscape orientation unless specifically noted otherwise.

Cut-Sheet Paper (Manual Feed)

Width:	7.2" to 16.5" / 183 to 420mm
Length:	5.5" to 14.3" / 140 to 364mm
Size:	B5, A4, Letter, Legal, B4 (Landscape), A3 (Landscape)
Thickness:	0.00276" to 0.00472" / 0.07 to 0.12mm (1-ply only)
Weight:	14 to 24 lbs / 52 to 90g/m ² / 45 to 77 kg

Cut-Sheet Paper (with Optional Automatic Sheet Feeder)

Width:	7.2" to 16.5" / 183 to 420mm
Length:	7.2" to 14" / 183 to 356mm
Size:	B5, A4, Letter, Legal, B4 (Landscape), A3 (Landscape)
Thickness:	0.00315" to 0.00472" / 0.08 to 0.12mm (1-ply only)
Weight:	16 to 24 lbs / 60 to 90g/m ² / 52 to 77 kg
Hopper:	50 sheets of 64g/m ² , 30 sheets of 80g/m ²
Stacker:	10 sheets

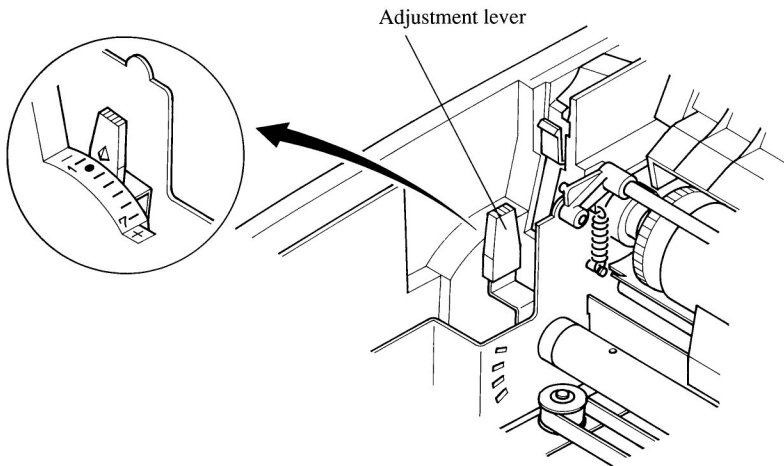
Fanfold Paper

Width (push feed):	4" to 16.0" / 101.6 to 406mm
Width (pull feed):	4" to 16.0" / 101.6 to 406mm
Thickness:	0.00276" to 0.00433" / 0.07 to 0.11mm (1-ply) 0.01378" / 0.35mm max. (total thickness of multi-ply, non-carbon)
Weight:	14 to 22 lbs / 52 to 81g/m ² / 45 to 70 kg (1-ply) 11 to 14 lbs / 40 to 52g/m ² / 34 to 45 kg (multi-ply)
Copies:	Original + 1 or 2 (Normal Mode)

Original + 3 to 4 (Multi-Part Mode)
Multi-part Mode and an optional pull tractor are recommended when printing on 4 or 5-ply paper.

Adjusting for paper thickness

Paper comes in different weights, normally expressed as gsm (grams per square meter) or lbs (pounds). Some form paper also has multiple pages that make them quite thick. Use the following procedure to change the gap between the print head and the platen and adjust for paper thickness.



- Move the adjustment lever to one of its settings. Position 2 or 3 is most suitable for single-sheet paper.

The following table provides a general guide for setting the adjustment lever. Experiment with different settings until you find the one that gives you the print quality you want.

Paper Type		Weight Per Sheet	Thickness	Recommended Position
Cut-sheet		52 to 90 g/m ²	0.07 to 0.12mm	2 or 3
Fanfold	1-ply	52 to 90 g/m ²	0.07 to 0.12mm	2 or 3
	2-ply	40 to 52 g/m ²	0.12 to 0.16mm	2 or 3
	3-ply	40 to 52 g/m ²	0.18 to 0.25mm	3 or 4
	4-ply	40 to 52 g/m ²	0.24 to 0.30mm	4 or 5
	5-ply	40 to 52 g/m ²	0.30 to 0.35mm	5 or 6

Important!

Continuous use of the wrong adjustment lever setting can drastically reduce print head life! The Multi-part Mode is recommended when printing on 4 or 5-ply paper.

Automatic fanfold feeding

- See “Loading fanfold paper” on page 9 for details on using fanfold paper.

Manual sheet feeding

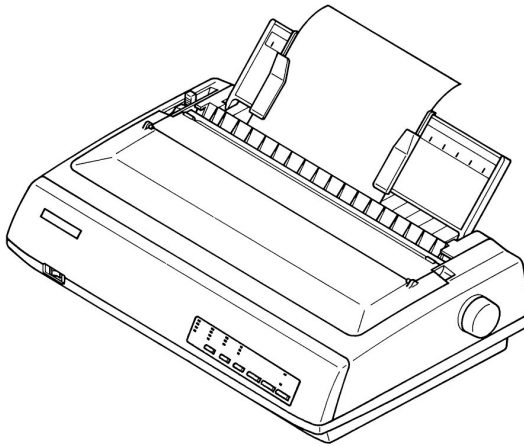
You can use the following procedure to manually feed single sheets of paper into the printer.

- Make sure that there is no fanfold paper in the printer. If there is, use the procedure under “Parking fanfold paper” on page 13 to park the fanfold paper and prepare for manual sheet feeding.
- Set the release lever to the cut-sheet position.
- Stand up the paper guide (page 8).
- Align the left paper guide with the scale mark that matches the size of the paper you are using.

For any paper size other than A3 landscape (horizontal), align the paper guide with scale 0 (zero). For A3 landscape paper, align the paper guide with the far left ► mark.

- Adjust the right paper guide so there is enough space to insert the paper.

Insert a sheet of paper into the paper guide, with the side you want to print on facing the back of the printer. Gently lower the paper down into the printer until you feel it stop.



- Press the **SET/EJECT/PARK** button to feed the paper to the starting position.
- If you want to move the paper to another position, use the micro feed function described under “Micro feed” on page 19.
- Start the printing operation from your software application.

Clearing paper jams

Use the following procedure to clear paper jams from the printer.

- Unplug the printer from its AC power outlet.
- Open the front cover of the printer.
- Carefully try to pull the jammed paper from the printer.
If necessary, change the release lever position or rotate the platen knob to remove the paper.

Chapter 6: Optional Accessories

This chapter introduces the following optional accessories that are available for this printer:

- Automatic Sheet Feeder (SF-15DM II)
- Pull Tractor Unit (PT-15XM)
- Serial Interface Cartridge (IS-8XL)
- Buffered Parallel Interface Cartridge (IP-128XL)
- Serial-to-Parallel Converter (SPC-8K)

Important!

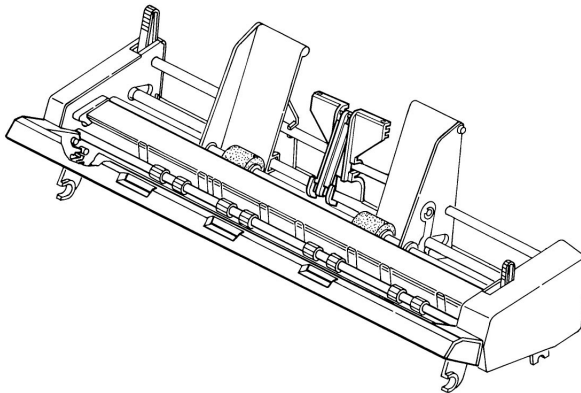
Always make sure that printer power is turned off whenever installing or removing optional accessories.

Automatic Sheet Feeder (SF-15DM II)

The automatic sheet feeder automatically feeds cut sheet paper into the printer.

Preparing the printer

- Use the printer's EDS Mode to change the setting of Bank A Switch 4 to OFF (page 27), which tells the printer that the automatic sheet feeder is installed.

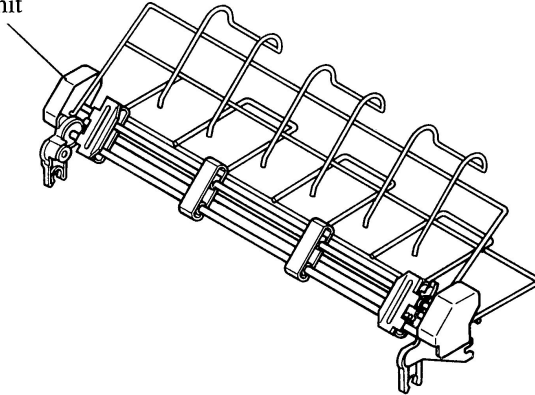


Refer to the manual that comes with the automatic sheet feeder for further details on installation and operation.

Pull Tractor Unit (PT-15XM)

The pull tractor unit is recommended when printing with multi-part continuous forms.

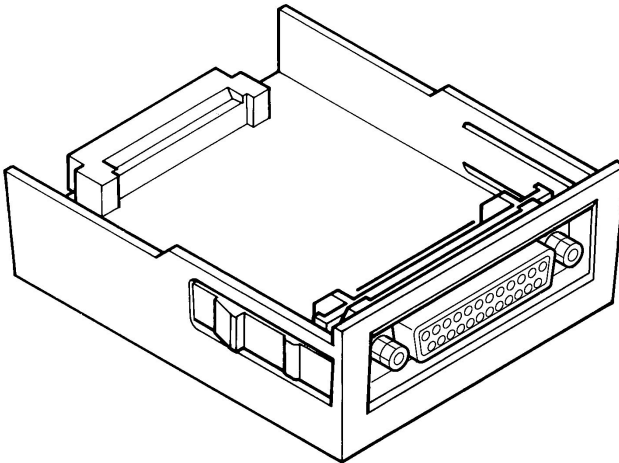
Pull Tractor Unit



Refer to the manual that comes with the pull tractor unit for further details on installation and operation.

Serial Interface Cartridge (IS-8XL)

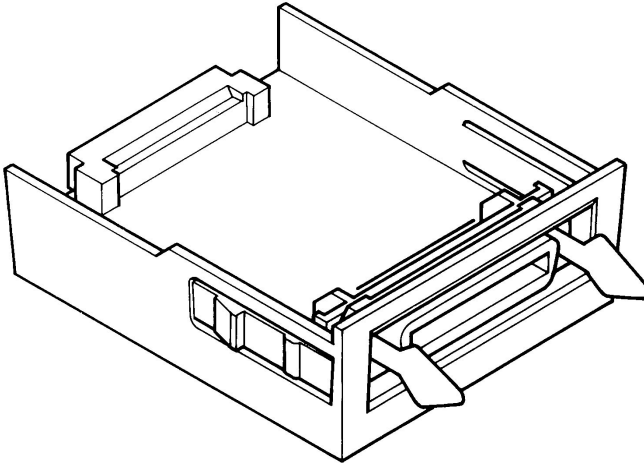
Installing the serial interface cartridge provides serial data communications capabilities between the printer and your computer.



Refer to the manual that comes with the serial interface cartridge for further details on installation and operation.

Buffered Parallel Interface Cartridge (IP-128XL)

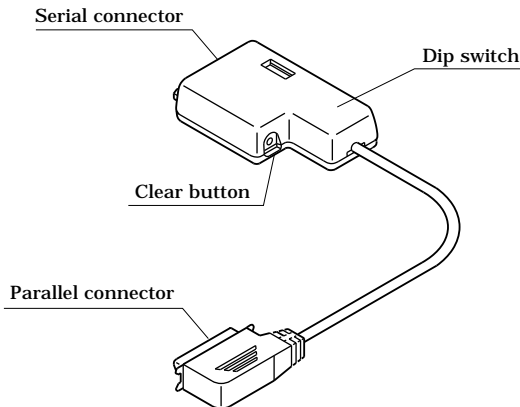
Installing the parallel interface cartridge provides parallel data communications capabilities between the printer and your computer.



Refer to the manual that comes with the buffered parallel interface cartridge for further details on installation and operation.

Serial-to-Parallel Converter (SPC-8K)

Connecting the serial-to-parallel converter to the printer's parallel connector provides serial data communications capabilities between the printer and your computer.



Specifications

Interface	RS-232C-level
Synchronization	Asynchronous
Baud rate	150, 300, 600, 1200, 2400, 4800, 9600, 19200 BPS (selectable)
Word length	
Start bit	1
Data bits	7 or 8 (selectable)
Parity bit	Odd, even, none (selectable)
Stop bits	One or more
Signal polarity	
Mark	Logical 1 (-3V to -15V)
Space	Logical 0 (+3V to +15V)
Handshaking	DTR, XON/XOFF, ETX/ACK
Data buffer	8 kbytes (standard)

Refer to the manual that comes with the serial-to-parallel converter for further details on installation and operation.

Appendix A: Troubleshooting

This appendix will help you if you experience problems with your printer. It tells you how to test the printer, how to check system software settings, and how to adjust the vertical alignment. In addition, there is information on actions to take for specific problems.

Warning!

The printer uses high voltage. Do not attempt any other repair or maintenance except as expressly recommended in this appendix. Unauthorized repair and maintenance not only exposes you to the danger of electrical shock, it also may damage your printer and void your warranty.

Testing the printer

There are two different tests you can use: a self test and a hexadecimal dump.

Self test

- Make sure that paper is loaded in the printer.
- Turn the printer off.
- While holding down the control panel's **ON LINE** button or **LINE FEED** button, turn the printer on.
- To stop demo printing, turn the printer off.

Note:

- *The self test prints across the entire width of the carriage. Make sure that the printer is loaded with the widest paper available in order to avoid damage to the print head and platen.*
 - *Since this test can generate many lines of text and graphics, it is a good idea to perform this test only when using continuous fanfold paper rather than single sheets.*
-

Hexadecimal dump

This procedure prints in hexadecimal format all codes (character codes and control codes) that are sent to the printer by the computer. The printer does not execute any control codes (such as 0A - linefeed), it just prints them out. The hexadecimal dump is useful when you are writing programs for printer control.

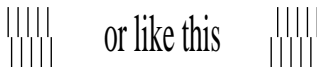
- Make sure that paper is loaded in the printer.
- Turn off the printer.
- While holding down the control panel's **FORM FEED** button, turn the printer back on to enter the Hex Dump Mode.
- The printer will now print out the hexadecimal values of any data that is subsequently sent to it from your computer.
- To exit the Hex Dump Mode, first press **ON LINE** to set the printer off-line, and then turn the printer off.

Adjusting the dot alignment

You may never have to use the procedure described in this section, but after you have been using your printer for some time you may find that the dots of some graphics do not align correctly. For example, what should look like:



may come out looking like one of the following:



This is caused when mechanical parts of the printer get out of alignment. This happens only rarely and you may never experience it at all throughout the life of the printer. If you do have problems, use the following procedure to correct it.

- Make sure that paper is loaded in the printer.
- Turn off the printer.

- While holding down the control panel's **FORM FEED** and **ON LINE** buttons, turn the printer back on to enter the Dot Adjustment Mode. The printer will print something like the following.

*** DOT ADJUSTMENT SETTING ***

Normal-density 0 : ||| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Note that the printer will feed the paper forward and back each time during this operation so you can view the printout.

- If the two lines do not align properly, use **FONT** to move the middle line to the left or **PITCH** to move it to the right.

The above step performs alignment for Normal-density mode only. You must make separate adjustments for the HS-DRAFT, CRT graphics mode I, DRAFT Graphics, DRAFT Graphics Speed Down, Double-density, CRT graphics mode II, CRT graphics mode II SD, Triple-density, Quadruple-density, LQ Graphics, LQ Graphics Speed Down modes as well.

- Press **SET/EJECT/PARK** to change to another printing mode.
- Repeat the above steps for each printing mode, if necessary.
- After making changes to adjustments in all the printing modes you want, press **ON LINE** to exit the Dot Adjustment Mode and register your adjustments.

Troubleshooting guide

Use the following table to help track down the causes of problems and to determine the best solution to deal with them.

Problem	Possible Cause	Recommended Action
The ON LINE indicator does not light.	The printer is not receiving power.	Check whether the power cord is correctly plugged into the power outlet.
		Check whether the power outlet is working by unplugging the printer and plugging in another device.
Printer sounds like it is printing, but it is not. Printing is weak.	The ribbon is jammed, twisted, or not set correctly between the print head and the print head shield.	Make sure that the ribbon cassette is installed correctly.
	The printer is not set up correctly for the thickness of paper you are using.	Set up the printer for the paper thickness you are using. See "Adjusting for paper thickness" on page 39.
	The ribbon is worn out or "used up."	Replace the ribbon with a new one.
Printer test works, but printer will not print out data from the attached computer.	Your application program's or system software's printer selection is wrong.	Check the printer selection of your application software.
	The computer's system software is not set up properly for the printer or for the port you are using.	Check the system software settings. Check the settings for LPT1, COM 1, or COM 2 if you are using the optional serial interface unit.
	The interface cable is connected incorrectly or damaged.	Check to make sure that the printer interface cable is connected correctly. If it is, try a different cable.

Problem	Possible Cause	Recommended Action
Printer case is hot.	The printer's air vents are blocked or obstructed.	Switch off the printer and let it cool. Check the air vents on the bottom of the printer to see if they are blocked. Remove the obstruction if possible. If the problem persists, return the printer to your dealer for repair.
Printer makes excessive noise.	The front cover is removed.	Replace the front cover.
	The printer is vibrating.	Move any objects that are touching the printer.
		Make sure that the printer is on a level steady surface.
Printer prints past the edge of the paper.	Incorrect margin settings are selected by your application program.	Choose different margin settings from your application program.
	The paper guide is not positioned correctly.	Remove the paper and adjust the position of the paper guide. Reload the paper and try printing again.
	The ribbon is jammed, causing the print head to jam.	Make sure that the ribbon cassette is installed correctly. See "Installing the ribbon cartridge" on page 5.
	Paper is jamming, causing the print head to jam.	Remove all paper from the printer and reload it. Try printing again.
Set up the printer for the paper thickness you are using. See "Adjusting for paper thickness" on page 39.		

Problem	Possible Cause	Recommended Action
Left margin moves to the right during printing.	The paper is not loaded correctly, causing the print head to jam.	Remove all paper from the printer and reload it. Try printing again.
	The ribbon cassette is not installed correctly, causing the print head to jam.	Make sure that the ribbon cassette is installed correctly. See "Installing the ribbon cartridge" on page 5.
	The printer is not set up correctly for the thickness of paper being used.	Set up the printer for the paper thickness you are using. See "Adjusting for paper thickness" on page 39.
	Inappropriate settings are selected by your application program.	Choose different settings in your application.
	Static electricity caused by interference from nearby electrical devices or by low-level humidity is affecting printer operation.	Make sure that the printer is not too close to any devices with electric motors or try to raise the humidity level.
Some characters are printed incorrectly.	Static electricity caused by interference from nearby electrical devices or by low-level humidity is affecting printer operation.	Make sure that the printer is not too close to any devices with electric motors or try to raise the humidity level.
	Inappropriate settings are selected by your application program.	Choose different settings in your application.
	Wires are missing from the print head.	Return the printer to your dealer for repair.

Checking system software settings in MS-DOS

If you are using a parallel cable and cannot print a text file using the MS-DOS PRINT command, you may have a problem with your AUTOEXEC.BAT file. Open the file and look for the following line:

```
MODE LPT1 :=COM1 or MODE LPT1 :=COM2
```

These lines indicate you are using a serial cable connection, and so you should delete them, save the AUTOEXEC.BAT file, reboot and try printing again.

Of course, if you are having problems printing with the optional serial-to-parallel converter or optional serial interface unit, you should conversely check to make sure that one of the above lines is included in your AUTOEXEC.BAT file. The file must also contain information on parameter settings. For details, see the user's manual that comes with the optional serial-to-parallel interface converter or optional serial interface unit.

If the above is not the problem or if you make the above changes and still experience problems printing using the MS-DOS PRINT command, refer to your *MS-DOS Users' Guide* or consult your software dealer.

If you are successful in printing using the MS-DOS PRINT command but cannot print from an application, check to see what printer driver is selected in the application. See "Setting up for printing with MS-DOS" on page 36. If this does not help, consult your software dealer.

Appendix B: Specifications

Printing System

Serial Impact Dot-Matrix

Printing Speed

Pitch	Draft (cps/dpi)	LQ (cps/dpi)
Pica (10 cpi)	283/120H (Normal) 350/80H (HS)	94/360H
Elite (12 cpi)	340/120H	113/360H
Semi-condensed (15 cpi (S))	425/120H	141/360H
Semi-condensed (15 cpi (I))	212/240H	141/360H
Condensed pica (17 cpi)	242/240H	161/360H
Condensed elite (20 cpi)	283/240H	188/360H
24 cpi (I)	340/240H	226/360H

H: half-dot

(S): Standard mode only

(I): IBM mode only

Print Direction

Draft: Uni-directional/ bi-directional logic seeking (selectable)

LQ: Uni-directional/ bi-directional logic seeking (selectable)

Bit-Image: Uni-directional/ bi-directional logic seeking (selectable)

Print Head

Number of pins: 24

Life: 200 million dots/pin (Normal Mode)
100 million dots/pin (Multi-Part Mode)

Line Spacing

1/6", 1/8", 7/60", n/180", n/360"

7/72", n/72", n/216": software

Character Matrix

Pitch	Draft	LQ
Pica (10 cpi)	24 × 9H (Normal) 24 × 7H (HS)	24 × 31H
Elite (12 cpi)	24 × 9H	24 × 27H
Semi-condensed (15 cpi(S))	16 × 7H	16 × 21H
Semi-condensed (15 cpi(I))	24 × 9H	24 × 16H
Condensed pica (17 cpi)	24 × 9H	24 × 16H
Condensed pica (20 cpi)	24 × 9H	24 × 16H
24 cpi (I)	24 × 9H	24 × 14H

H: half-dot

(S): Standard mode only

(I): IBM mode only

54 Specifications

Environment	Operating temperature:	41°F to 95°F (5°C to 35°C)
	Storage temperature:	-22°F to 149°F (-30°C to 65°C)
	Operating humidity:	30% to 80% (non-condensing)
	Storage humidity:	20% to 90% (non-condensing)
Paper	Cut-sheet (manual feeding)	
	Paper width:	7.2" to 16.5" / 183 to 420 mm
	Paper length:	5.5" to 14.3" / 140 to 364 mm
	Paper thickness:	0.00276" to 0.00472" / 0.07 to 0.12 mm
	Paper weight:	14 to 24 lbs. / 52 to 90 g/m ² / 45 to 77 kg
	Cut-sheet (with optional automatic sheet feeder)	
	Paper size:	B5, A4, LT, B4, A3, Legal
	Paper thickness:	0.00315" to 0.00472" / 0.08 to 0.12 mm
	Paper weight:	16 to 24 lbs. / 60 to 90 g/m ² / 52 to 77 kg
	Hopper:	50 sheets of 64 g/m ² 30 sheets of 80 g/m ²
	Stacker:	10 sheets
	Fanfold (with push tractor feeder)	
	Paper width:	4" to 16.0" / 101.6 to 406 mm
Paper thickness:	0.00276" to 0.00433" / 0.07 to 0.11 mm (one-ply) 0.01378" / 0.35 mm maximum (total thickness of multi-ply paper, non-carbon)	
Paper weight:	14 to 22 lbs. / 52 to 82 g/m ² / 45 to 70 kg (one-ply) 11 to 14 lbs. / 40 to 52 g/m ² / 34 to 45 kg (multi-ply)	
Copies:	Original + 1 or 2 (Normal Mode) Original + 3 or 4 (Multi-Part Mode) * Multi-Part Mode is recommended when using optional pull tractor unit.	
Fanfold (with optional pull tractor feeder)		
Paper width:	4" to 16.0" / 101.6 to 406 mm	
Paper thickness:	0.00276" to 0.00433" / 0.07 to 0.11 mm (one-ply) 0.01378" / 0.35 mm maximum (total thickness of multi-ply paper, non-carbon)	
Paper weight:	14 to 22 lbs. / 52 to 82 g/m ² / 45 to 70 kg (one-ply) 11 to 14 lbs. / 40 to 52 g/m ² / 34 to 45 kg (multi-ply)	
Copies:	Original + 1 or 2 (Normal Mode) Original + 3 or 4 (Multi-Part Mode)	
Emulation	Standard Mode:	EPSON ESC/P (24-pin) NEC Graphic compatible
	IBM Mode:	Proprietary XL24E
Interface	Standard:	Centronics parallel
	Option:	RS-232C serial
Ribbon Type	On-carriage, dedicated	
	Fabric monochrome ribbon	
	Color ribbon	

Ribbon Life	Fabric monochrome ribbon (LZ24HD): 4.0 million characters (draft pica) Color ribbon (X24CL): 1.0 million characters
Dimensions and weight	Width: 23.9" / 608 mm Depth: 15.8" / 400 mm Height: 6.2" / 157 mm Weight: 27.2 lbs. / 12.3 kg
Power Supply	230V AC +14%/-13%; 50/60Hz
Power Consumption	15W during standby / 70W during ASCII draft printing
Options	PT-15XM Pull Tractor Unit SF-15DM II Single-Bin Automatic Sheet Feeder IS-8XL Serial Interface Unit IP-128XL Parallel Interface Unit SPC-8K Serial-To-Parallel Converter

Appendix C: Interface Pin Outs

Parallel Interface

Pin	Name	Function
1	STROBE	Goes low for $\geq 0.5\mu\text{s}$ when active.
2	DATA0	These signals represent information for the 1st through 8th bit of parallel data, respectively. Each signal is HIGH when data is logical 1, and LOW when logical 0.
3	DATA1	
4	DATA2	
5	DATA3	
6	DATA4	
7	DATA5	
8	DATA6	
9	DATA7	
10	ACK	10 μs low to acknowledge receipt of data.
11	BUSY	Printer sets line low when ready to receive data.
12	PAPER	High when paper runs out.
13	SELECT	High when printer is on-line.
14	AFXT	Printer ignores this signal
15		Not used.
16	SIGNAL GND	Signal ground
17	CHASSIS	Chassis ground (isolated from signal ground)
18	+5V	+5V DC output from printer
19 - 30	GND	Twisted pair ground return
31	RESET	Printer is reset when this signal goes low.
32	ERROR	Low when printing cannot continue due to error.
33	EXT GND	External ground
34 - 35		Not used
36	SELECT IN	Printer ignores this signal

Optional Serial Interface

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

Appendix D: Character Sets

Standard Italic Character Set

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	<NUL>		0	@	P	`	p	à	Š		O	@	P	`	p	
1	<DC1>	!	1	A	Q	a	q	è	ß	!	1	A	Q	a	q	
2	<DC2>	"	2	B	R	b	r	ù	Æ	"	2	B	R	b	r	
3	<DC3>	#	3	C	S	c	s	ó	æ	#	3	C	S	c	s	
4	<DC4>	\$	4	D	T	d	t	i	Ø	\$	4	D	T	d	t	
5		%	5	E	U	e	u	°	ø	%	5	E	U	e	u	
6		&	6	F	V	f	v	£	''	&	6	F	V	f	v	
7	<BEL>	'	7	G	W	g	w	ı	Á	'	7	G	W	g	w	
8	<BS > <CAN>	(	8	H	X	h	x	ı	Ö	(	8	H	X	h	x	
9	<HT >)	9	I	Y	i	y	Ń	Û)	9	I	Y	i	y	
A	<LF>	*	:	J	Z	j	z	ñ	ä	*	:	J	Z	j	z	
B	<VT > <ESC>	+	;	K	[	k	{	ı	ö	+	;	K	[	k	{	
C	<FF > <PS>	,	<	L	\	l	!	Ŕ	ü	,	<	L	\	l	!	
D	<CR>	-	=	M	]	m	}	Á	É	-	=	M	]	m	}	
E	<SO>	.	>	N	^	n	~	á	é	.	>	N	^	n	~	
F	<SI>	/	?	O	_	o		ç	¥	/	?	O	_	o		

International Character Set

The character codes shown in the table are hexadecimal.

Conuntry	23	24	40	58	5A	5B	5C	5D	5E	60	7B	7C	7D	7E
U.S.A.	#	\$	@	X	Z	[	\	\]	^	`	{	|	}	~
FRANCE	#	\$	à	X	Z	°	ç	Š	^	`	é	ù	è	''
GERMANY	#	\$	Š	X	Z	À	Ö	Û	^	`	ä	ö	ü	ß
ENGLAND	£	\$	@	X	Z	[	\	\]	^	`	{	|	}	~
DENMARK 1	#	\$	@	X	Z	Æ	Ø	Å	^	`	æ	ø	å	~
SWEDEN	#	ı	É	X	Z	À	Ö	Å	Û	é	ä	ö	å	ü
ITALY	#	\$	@	X	Z	°	\	é	^	ù	à	ò	è	i
SPAIN 1	Ŕ	\$	@	X	Z	ı	Ń	ı	^	'	''	ñ	}	~
JAPAN	#	\$	@	X	Z	[	¥	]	^	`	{	|	}	~
NORWAY	#	ı	É	X	Z	Æ	Ø	Å	Û	é	æ	ø	å	ü
DENMARK 2	#	\$	É	X	Z	Æ	Ø	Å	Û	é	æ	ø	å	ü
SPAIN 2	#	\$	á	X	Z	ı	Ń	ı	é	'	ı	ñ	ó	ú
LATIN AMERICA	#	\$	á	X	Z	ı	Ń	ı	é	ü	ı	ñ	ó	ú
KOREA	#	\$	@	X	Z	[	₩	]	^	`	{	|	}	~
IRELAND	#	\$	@	ú	/	[	\	\]	^	`	Á	É	Ó	~
LEGAL	#	\$	Š	X	Z	°	'	''	¶	`	©	®	†	™

**IBM Character Set #2
Code Page #437 (IBM-PC)**

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

Character Set #1

Other characters are the same as those for Character Set #2.

	0	1
0	<NUL>	
1	<DC1>	
2	<DC2>	
3	<DC3>	
4	<DC4>	
5		
6	<SYN>	
7	<BEL>	
8	<BS ><CAN>	
9	<HT >	
A	<LF >	
B	<VT ><ESC >	
C	<FF ><FS >	
D	<CR >	
E	<SO >	
F	<SI >	

	8	9
0	<NUL>	
1	<DC1>	
2	<DC2>	
3	<DC3>	
4	<DC4>	
5		
6	<SYN>	
7	<BEL>	
8	<BS ><CAN>	
9	<HT >	
A	<LF >	
B	<VT ><ESC >	
C	<FF ><FS >	
D	<CR >	
E	<SO >	
F	<SI >	

IBM Special Character Set

The following characters can be printed using the <ESC> ^ command.

	0	1
0	Ø	▶
1	⊕	◀
2	⊕	↑
3	♥	!!
4	♦	¶
5	♣	§
6	♠	—
7	•	↑
8	□	↑
9	○	↓
A	◻	→
B	♂	←
C	♀	↔
D	♪	↔
E	♫	▲
F	*	▼

Code Page #850 Multi-lingual

Other characters are the same as those for Code Page #437.

	8	9	A	B	C	D	E	F
0	Ç	É	Á	⌘	Ł	Ö	Ó	—
1	ü	æ	í	⌘	Ł	Ð	β	±
2	é	Æ	ó	⌘	Ł	Ê	Ó	=
3	â	ô	ú	|	Ł	Ë	Ò	≈
4	ä	ö	ñ	|	Ł	È	Õ	¶
5	à	ò	Ñ	A	Ł	É	Ö	§
6	â	û	ä	A	Ł	Í	µ	÷
7	ç	ù	ö	A	Ł	Ï	þ	°
8	ê	ÿ	¿	©	Ł	Ï	ÿ	°
9	ë	ÿ	©	¶	Ł	Ï	ÿ	°
A	è	Û	¬	¶	Ł	Ï	ÿ	°
B	ï	ø	½	¶	Ł	Ï	ÿ	°
C	î	£	¼	¶	Ł	Ï	ÿ	°
D	ì	Ø	ì	φ	=	Ł	ÿ	°
E	Ë	×	«	¥	=	Ł	ÿ	°
F	À	f	»	₯	■	Ł	ÿ	°

Code Page #860 Portuguese

Other characters are the same as those for Code Page #437.

	8	9	A	B	C	D	E	F
0	Ç	É	Á	⌘	Ł	μ	α	≡
1	ü	À	í	⌘	Ł	τ	β	±
2	é	È	ó	⌘	Ł	Γ	≥	
3	â	ô	ú	|	Ł	π	≤	
4	ä	ö	ñ	|	Ł	Σ	∫	
5	à	ò	Ñ	|	Ł	F	σ	J
6	â	û	ä	||	Ł	τ	μ	÷
7	ç	ù	ö	||	Ł	τ	τ	≈
8	ê	ÿ	¿	¶	Ł	Φ	Φ	°
9	ë	ÿ	©	¶	Ł	θ	•	
A	è	Û	¬	¶	Ł	Ω	•	
B	ï	φ	½	¶	Ł	δ	√	
C	î	£	¼	¶	Ł	∞	n	2
D	ì	Û	ì	μ	=	∅	2	
E	Ë	£	«	₯	■	∈	■	
F	À	ó	»	₯	■	∩		

Code Page #861 Icelandic

Other characters are the same as those for Code Page #437.

	8	9	A	B	C	D	E	F
0	Ç	É	Á	⌘	Ł	μ	α	≡
1	ü	æ	í	⌘	Ł	τ	β	±
2	é	Æ	ó	⌘	Ł	Γ	≥	
3	â	ô	ú	|	Ł	π	≤	
4	ä	ö	ñ	|	Ł	Σ	∫	
5	à	ò	Ñ	|	Ł	F	σ	J
6	â	û	ä	||	Ł	τ	μ	÷
7	ç	ù	ö	||	Ł	τ	τ	≈
8	ê	ÿ	¿	¶	Ł	Φ	Φ	°
9	ë	ÿ	©	¶	Ł	θ	•	
A	è	Û	¬	¶	Ł	Ω	•	
B	ï	φ	½	¶	Ł	δ	√	
C	î	£	¼	¶	Ł	∞	n	2
D	ì	Û	ì	μ	=	∅	2	
E	Ë	£	«	₯	■	∈	■	
F	À	f	»	₯	■	∩		

**Code Page #863
Canadian French**

Other characters are the same as those for Code Page #437.

	8	9	A	B	C	D	E	F
0	Ç	É	Í	Ï	Ł	Ш	α	≡
1	Û	È	ˆ	Ë	Ł	Ŧ	β	±
2	É	Ê	Ó	Ï	Ŧ	Π	Γ	≥
3	À	Ô	Ú	Ï	Ŧ	Π	π	≤
4	À	È	ˆ	Ë	Ŧ	Σ	Σ	∫
5	À	Ï	ˆ	Ë	Ŧ	ƒ	σ	∫
6	Ŧ	Û	ˆ	Ë	Ŧ	ƒ	μ	÷
7	Ç	Û	ˆ	Ë	Ŧ	ƒ	τ	≈
8	È	Ï	ˆ	Ë	Ŧ	ƒ	Φ	°
9	È	Ó	Ŧ	Ï	Ŧ	ƒ	Θ	•
A	È	Û	Ŧ	Ï	Ŧ	ƒ	Ω	•
B	Ï	Φ	½	Ŧ	Ŧ	ƒ	δ	√
C	Ï	£	¼	Ŧ	Ŧ	ƒ	∞	n
D	=	Û	¼	Ŧ	Ŧ	ƒ	∅	²
E	À	Û	«	Ŧ	Ŧ	ƒ	ε	■
F	Š	f	»	Ŧ	Ŧ	ƒ	∩	

**Code Page #865
Nordic**

Other characters are the same as those for Code Page #437.

	8	9	A	B	C	D	E	F
0	Ç	É	Á	Ï	Ł	Ш	α	≡
1	Û	æ	Í	Ë	Ł	Ŧ	β	±
2	É	Æ	Ó	Ï	Ŧ	Π	Γ	≥
3	À	Ô	Ú	Ï	Ŧ	Π	π	≤
4	À	Ö	Ï	Ë	Ŧ	Σ	Σ	∫
5	À	Û	Ï	Ë	Ŧ	ƒ	σ	∫
6	À	Û	ˆ	Ë	Ŧ	ƒ	μ	÷
7	Ç	Û	ˆ	Ë	Ŧ	ƒ	τ	≈
8	È	Û	ˆ	Ë	Ŧ	ƒ	Φ	°
9	È	Ö	Ŧ	Ï	Ŧ	ƒ	Θ	•
A	È	Û	Ŧ	Ï	Ŧ	ƒ	Ω	•
B	Ï	ø	½	Ŧ	Ŧ	ƒ	δ	√
C	Ï	£	¼	Ŧ	Ŧ	ƒ	∞	n
D	ì	Ø	ì	Ŧ	Ŧ	ƒ	∅	²
E	À	Ŧ	«	Ŧ	Ŧ	ƒ	ε	■
F	À	f	»	Ŧ	Ŧ	ƒ	∩	

**Code Page #866
Russian**

Other characters are the same as those for Code Page #437.

	8	9	A	B	C	D	E	F
0	А	Р	а	Ѡ	Ł	Ш	р	ѐ
1	Б	С	б	ѡ	Ł	Ŧ	с	ё
2	В	Т	в	Ѣ	Ŧ	Π	т	€
3	Г	У	г	ѣ	Ŧ	Π	у	€
4	Д	Ф	д	Ѥ	Ŧ	ƒ	ф	ı
5	Е	Х	е	ѥ	Ŧ	ƒ	х	ı
6	Ж	Ц	ж	Ѧ	Ŧ	ƒ	ц	ı
7	З	Ч	з	ѧ	Ŧ	ƒ	ч	ı
8	И	Ш	и	Ѩ	Ŧ	ƒ	ш	°
9	Й	Щ	й	ѩ	Ŧ	ƒ	щ	•
A	К	Ъ	к	Ѫ	Ŧ	ƒ	ъ	•
B	Л	Ы	л	ѫ	Ŧ	ƒ	ы	√
C	М	Ь	м	Ѭ	Ŧ	ƒ	ь	№
D	Н	Э	н	ѭ	Ŧ	ƒ	э	²
E	О	Ю	о	Ѯ	Ŧ	ƒ	ю	■
F	П	Я	п	ѯ	Ŧ	ƒ	я	

**Code Page #3840
IBM-Russian**

Other characters are the same as those for Code Page #437.

	8	9	A	B	C	D	E	F
0	А	Р	а	Ѡ	Ł	Ш	р	≡
1	Б	С	б	ѡ	Ł	Ŧ	с	±
2	В	Т	в	Ѣ	Ŧ	Π	т	≥
3	Г	У	г	ѣ	Ŧ	Π	у	≤
4	Д	Ф	д	Ѥ	Ŧ	ƒ	ф	∫
5	Е	Х	е	ѥ	Ŧ	ƒ	х	∫
6	Ж	Ц	ж	Ѧ	Ŧ	ƒ	ц	÷
7	З	Ч	з	ѧ	Ŧ	ƒ	ч	≈
8	И	Ш	и	Ѩ	Ŧ	ƒ	ш	°
9	Й	Щ	й	ѩ	Ŧ	ƒ	щ	•
A	К	Ъ	к	Ѫ	Ŧ	ƒ	ъ	•
B	Л	Ы	л	ѫ	Ŧ	ƒ	ы	√
C	М	Ь	м	Ѭ	Ŧ	ƒ	ь	n
D	Н	Э	н	ѭ	Ŧ	ƒ	э	²
E	О	Ю	о	Ѯ	Ŧ	ƒ	ю	■
F	П	Я	п	ѯ	Ŧ	ƒ	я	

Code Page #3841 Gost-Russian

Other characters are the same as those for Code Page #437.

	8	9	A	B	C	D	E	F
0	Р	Р	0	ю	п	Ю	П	
1	э	Э	!	а	я	А	Я	
2	ё	Ё	"	2	б	р	Б	Р
3	і	І	#	3	ц	с	Ц	С
4	ї	Ї	¤	4	д	т	Д	Т
5	ј	Ј	%	5	е	у	Е	У
6	к	К	&	6	ф	ж	Ф	Ж
7	е	Ө	'	7	г	в	Г	В
8	у	У	(	8	х	ь	Х	Ь
9	у	У	)	9	и	ы	И	Ы
A	х	Х	*	:	й	э	Й	Э
B	ң	Њ	+	;	к	ш	К	Ш
C	щ	Щ	,	<	л	э	Л	Э
D	ч	Ч	-	=	м	щ	М	Щ
E	е	Е	.	>	н	ч	Н	Ч
F	£	£	/	?	о	ь	О	Ө

Code Page #3843 Polish

Other characters are the same as those for Code Page #437.

	8	9	A	B	C	D	E	F
0	Ç	È	Ł	•••	Ł	ł	α	≡
1	ü	ę	Ż	•••	ł	ł	β	±
2	é	ł	ó	•••	ł	ł	Γ	λ
3	â	ô	Ó	|	ł	ł	π	≤
4	ä	ö	ń	ł	-	ł	Σ	∫
5	à	ć	Ń	ł	ł	ł	σ	∫
6	ą	ù	ź	ł	ł	ł	μ	÷
7	ç	ù	ż	ł	ł	ł	τ	≈
8	ê	ś	Ś	ł	ł	ł	φ	°
9	ë	ő	ŕ	ł	ł	ł	θ	•
A	è	ű	ł	ł	ł	ł	Ω	•
B	í	ż	½	ł	ł	ł	δ	√
C	î	ł	¼	ł	ł	ł	∞	n
D	ó	ŷ	;	ł	=	ł	∅	²
E	Å	ś	«	ł	ł	ł	€	■
F	À	ŝ	»	ł	ł	ł	∅	∅

Code Page #3844 CS2

Other characters are the same as those for Code Page #437.

	8	9	A	B	C	D	E	F
0	Č	ě	á	•••	Ł	ł	α	≡
1	ú	ž	í	•••	ł	ł	β	±
2	é	ž	ó	•••	ł	ł	Γ	λ
3	ď	ô	ú	|	ł	ł	π	≤
4	ä	ö	ň	ł	-	ł	Σ	∫
5	Đ	ó	Ń	ł	ł	ł	σ	∫
6	T	ù	Ů	ł	ł	ł	μ	÷
7	č	ú	š	ł	ł	ł	τ	≈
8	ě	ý	š	ł	ł	ł	φ	°
9	E	ö	ř	ł	ł	ł	θ	•
A	Ĺ	ű	ř	ł	ł	ł	Ω	•
B	í	S	R	ł	ł	ł	δ	√
C	í	L	¼	ł	ł	ł	∞	n
D	í	Y	§	ł	=	ł	∅	²
E	Å	R	«	ł	ł	ł	€	■
F	A	ř	»	ł	ł	ł	∅	∅

Code Page #3845 Hungarian

Other characters are the same as those for Code Page #437.

	8	9	A	B	C	D	E	F
0	Ç	É	Á	•••	Ł	ł	α	≡
1	ü	æ	í	•••	ł	ł	β	±
2	é	Æ	ó	•••	ł	ł	Γ	λ
3	â	ö	ú	|	ł	ł	π	≤
4	ä	ö	ñ	ł	-	ł	Σ	∫
5	à	ó	Ń	ł	ł	ł	σ	∫
6	á	ú	ä	ł	ł	ł	μ	÷
7	ç	ú	ő	ł	ł	ł	τ	≈
8	ê	ű	ő	ł	ł	ł	φ	°
9	ë	ő	ŕ	ł	ł	ł	θ	•
A	è	ű	ł	ł	ł	ł	Ω	•
B	í	ç	½	ł	ł	ł	δ	√
C	î	é	¼	ł	ł	ł	∞	n
D	ó	ŷ	;	ł	=	ł	∅	²
E	Å	ŕ	«	ł	ł	ł	€	■
F	À	ŝ	»	ł	ł	ł	∅	∅

**Code Page #3846
Turkish**

Other characters are the same as those for Code Page #437.

	8	9	A	B	C	D	E	F
0	Ç	É	á	☼	Ł	μ	α	≡
1	ü	æ	í	☼	Ł	τ	β	±
2	é	Æ	ó	☼	Τ	π	Γ	¿
3	â	ô	ú	|	ł	μ	π	≤
4	ä	ö	ñ	|	-	Ł	Σ	ƒ
5	à	ò	Ñ	ł	ł	F	σ	J
6	â	û	G	ł	ł	π	μ	÷
7	ç	ù	ë	π	ł	ł	τ	≈
8	ê	İ	İ	ł	ł	ł	θ	°
9	ë	ö	ı	ł	ł	ł	Φ	•
A	è	Û	ı	ł	ł	Ł	Ω	•
B	ÿ	ç	½	ł	ł	■	δ	√
C	î	£	¼	ł	ł	■	∞	n
D	ı	¥	;	ł	=	■	∅	²
E	Ä	Ş	«	ł	ł	■	ε	■
F	Å	Ş	»	ł	±	■	∩	

**Code Page #3847
Brazil-ABNT**

Other characters are the same as those for Code Page #437.

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

**Code Page #3848
Brazil-ABICOMP**

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

	8	9	A	B	C	D	E	F
0			ò	ı	ò			
1			À	ó	à	ó		
2			Á	ô	á	ô		
3			Â	õ	â	õ		
4			Ã	ö	ã	ö		
5			Ä	æ	ä	æ		
6			Ç	ù	ç	ù		
7			È	ú	è	ú		
8			É	û	é	û		
9			Ê	ü	ê	ü		
A			Ë	ý	ë	ý		
B			Ï		ı	β		
C			İ	£	ı	α		
D			ı	!	ı	∅		
E			ÿ	Ş	ı	¿		
F			Ñ	°	ñ	±		

**Code Page #852
Latin-2**

Other characters are the same as those for Code Page #437.

	8	9	A	B	C	D	E	F
0	Ç	É	á	☼	Ł	đ	Ó	-
1	ü	ı	í	☼	Ł	Ð	β	"
2	é	ı	ó	☼	Τ	Ð	Ò	„
3	â	ô	ú	|	ł	È	Ñ	˘
4	ä	ö	ñ	|	-	đ	ń	˙
5	û	Ł	ą	À	ł	Ñ	ñ	§
6	ć	ı	Z	Â	Ā	ı	S	÷
7	ç	Š	ž	Ê	ă	ı	Š	,
8	ł	ś	Ę	Ş	Ł	ė	Ŕ	°
9	ë	ö	e	ł	ł	J	Ů	¨
A	ő	Û		ł	ł	ŕ	•	
B	õ	T	ž	ł	ł	Ů	ú	
C	ı	ť	Č	ł	ł	ý	Ŕ	
D	Z	Ł	š	Z	=	Ÿ	ř	
E	Ä	×	«	ž	ł	Ů	•	
F	Č	č	»	ł	¤	•	˘	

**Code Page #1001
Arabic**

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	<NUL>		ء	@	ط	ـ	ي	ع	ا	ف	ش	ل	م	ال	ق	ث
1	<DC1>	!	آ	ت	ظ	ك	ح	ع	أ	ف	ع	ل	م	ال	ق	ث
2	<DC2>	"	إ	ث	ع	ل	ع	ج	ب	ف	ظ	ت	م	ال	ق	ث
3	<DC3>	#	ؤ	ث	ع	ل	ع	ج	ب	ف	ظ	ت	م	ال	ق	ث
4	<DC4>	\$	أ	د	ع	ل	ع	ج	ب	ف	ظ	ت	م	ال	ق	ث
5	◆	§	%	ن	ع	ل	ع	ج	ب	ف	ظ	ت	م	ال	ق	ث
6	♣	&	ا	ر	ف	م	ح	ع	ج	ب	ف	ظ	ت	م	ال	ق
7	<BEL>	'	ب	ن	ف	م	ح	ع	ج	ب	ف	ظ	ت	م	ال	ق
8	<BS > <CAN>	(	ـ	ق	ق	ـ	ـ	ـ	ـ	ـ	ـ	ـ	ـ	ـ	ـ	ـ
9	<HT> <BM>	)	ء	ع	ف	ن	ع	ج	ب	ف	ظ	ت	م	ال	ق	ث
A	<LF>	*	:	ش	ك	ن	ع	ج	ب	ف	ظ	ت	م	ال	ق	ث
B	<VT> <ESC>	+	:	ش	[	ء	{	ء	ن	ع	ج	ب	ف	ظ	ت	م
C	<FF> <FS>	,	<	ض	\	ء	|	ء	ن	ع	ج	ب	ف	ظ	ت	م
D	<CR>	-	=	ط	]	و	}	و	ن	ع	ج	ب	ف	ظ	ت	م
E	<SO>	.	>	ض	ء	ي	ء	ظ	ب	ف	ظ	ت	م	ال	ق	ث
F	<SI>	/	ن	ط	ـ	ع	ء	ظ	ب	ف	ظ	ت	م	ال	ق	ث

**Code Page #737
Greek**

Other characters are the same as those for Code Page #437.

	8	9	A	B	C	D	E	F
0	A	P	ι	␣	Λ	μ	ω	Ω
1	B	Σ	κ	␣	Τ	ϕ	ά	±
2	Γ	T	λ	␣	Τ	π	έ	≥
3	Δ	Y	μ	|	τ	μ	ή	≤
4	E	Φ	v	+	-	ε	ι	Υ
5	Z	X	ξ	+	+	F	ι	Υ
6	H	Ψ	ο	||	τ	π	ό	÷
7	Θ	Ω	π	||	τ	π	ύ	≈
8	I	α	ε	τ	||	τ	ü	°
9	K	β	σ	||	τ	π	ώ	•
A	Λ	γ	ς	||	τ	π	Ά	•
B	M	δ	τ	||	τ	π	Ε	√
C	N	ε	υ	␣	||	τ	H	n
D	E	ξ	φ	μ	=	␣	I	²
E	O	η	χ	+	||	τ	Ö	■
F	Π	θ	ψ	τ	±	␣	Υ	

**Code Page #851
Greek**

Other characters are the same as those for Code Page #437.

	8	9	A	B	C	D	E	F
0	Ç	I	ι	␣	Λ	T	ξ	-
1	ü		τ	␣	τ	Y	η	±
2	é	Ο	ó	␣	τ	Φ	θ	υ
3	â	δ	ú	|	τ	X	ι	φ
4	ä	ö	A	+	-	Ψ	κ	χ
5	à	Y	B	K	+	Ω	λ	§
6	A	ù	Γ	Λ	Π	α	μ	ψ
7	ç	ù	Δ	M	P	β	v	°
8	è	Ω	E	N	ε	γ	ξ	°
9	ë	ö	Z	||	τ	π	ο	°
A	è	Ü	H	||	τ	π	ω	
B	ï	á	½	||	τ	π	ε	ü
C	î	£	Θ	||	τ	π	σ	ü
D	E	é	I	ε	=	δ	ς	ώ
E	Ä	ή	«	O	||	τ	e	■
F	H	ι	»	τ	Σ	■	'	

**Code Page #869
Greek**

Other characters are the same as those for Code Page #437.

	8	9	A	B	C	D	E	F
0		ı	ı̇	ı̈	ı̉	ı̊	ı̋	ı̌
1		ı̍	ı̎	ı̏	ı̐	ı̑	ı̒	ı̓
2		ı̔	ı̕	ı̖	ı̗	ı̘	ı̙	ı̚
3		ı̛	ı̜	ı̝	ı̞	ı̟	ı̠	ı̡
4		ı̣	ı̤	ı̥	ı̦	ı̧	ı̨	ı̩
5		ı̪	ı̫	ı̬	ı̭	ı̮	ı̯	ı̰
6	ı̱	ı̲	ı̳	ı̴	ı̵	ı̶	ı̷	ı̸
7	ı̹	ı̺	ı̻	ı̼	ı̽	ı̾	ı̿	ı̿
8	ı̿	ı̿	ı̿	ı̿	ı̿	ı̿	ı̿	ı̿
9	ı̿	ı̿	ı̿	ı̿	ı̿	ı̿	ı̿	ı̿
A	ı̿	ı̿	ı̿	ı̿	ı̿	ı̿	ı̿	ı̿
B	ı̿	ı̿	ı̿	ı̿	ı̿	ı̿	ı̿	ı̿
C	ı̿	ı̿	ı̿	ı̿	ı̿	ı̿	ı̿	ı̿
D	ı̿	ı̿	ı̿	ı̿	ı̿	ı̿	ı̿	ı̿
E	ı̿	ı̿	ı̿	ı̿	ı̿	ı̿	ı̿	ı̿
F	ı̿	ı̿	ı̿	ı̿	ı̿	ı̿	ı̿	ı̿

**Code Page #928
Greek**

Other characters are the same as those for Code Page #437.

	8	9	A	B	C	D	E	F
0			°	ı̇	ı̈	ı̉	ı̊	ı̋
1			ı̌	ı̍	ı̎	ı̏	ı̐	ı̑
2			ı̒	ı̓	ı̔	ı̕	ı̖	ı̗
3			ı̙	ı̚	ı̛	ı̜	ı̝	ı̞
4			ı̟	ı̠	ı̡	ı̢	ı̣	ı̤
5			ı̦	ı̧	ı̨	ı̩	ı̪	ı̫
6			ı̬	ı̭	ı̮	ı̯	ı̰	ı̱
7			ı̲	ı̳	ı̴	ı̵	ı̶	ı̷
8			ı̸	ı̹	ı̺	ı̻	ı̼	ı̽
9			ı̾	ı̿	ı̿	ı̿	ı̿	ı̿
A			ı̿	ı̿	ı̿	ı̿	ı̿	ı̿
B			ı̿	ı̿	ı̿	ı̿	ı̿	ı̿
C			ı̿	ı̿	ı̿	ı̿	ı̿	ı̿
D			ı̿	ı̿	ı̿	ı̿	ı̿	ı̿
E			ı̿	ı̿	ı̿	ı̿	ı̿	ı̿
F			ı̿	ı̿	ı̿	ı̿	ı̿	ı̿

**Code Page #2001
Lithuanian-KBL**

Other characters are the same as those for Code Page #437.

	8	9	A	B	C	D	E	F
0	A	P	a	ı̇	L	ı̈	p	E
1	B	C	b	ı̉	ı̊	c	e	
2	V	T	v	ı̋	T	t	E	
3	G	U	g	ı̌	ı̍	u	e	
4	D	Φ	d	ı̎	ı̏	φ	"	
5	E	X	e	ı̐	ı̑	x	i	
6	Ж	Ц	ж	ı̒	ı̓	ц	š	
7	З	Ч	з	ı̔	ı̕	ч	š	
8	И	Ш	и	ı̖	ı̗	ш	ı̘	
9	Й	Щ	й	ı̙	ı̚	щ	ı̛	
A	К	Ь	к	ı̜	ı̝	ь	ı̟	
B	Л	Н	л	ı̞	ı̟	н	ı̡	
C	М	Ь	м	ı̠	ı̡	ь	ı̣	
D	Н	Э	н	ı̢	ı̣	э	ı̤	
E	О	Ю	о	ı̥	ı̦	ю	ı̧	
F	П	Я	п	ı̨	ı̩	я	ı̫	

**Code Page #772
Lithuanian**

Other characters are the same as those for Code Page #437.

	8	9	A	B	C	D	E	F
0	A	P	a	ı̇	L	a	p	E
1	B	C	b	ı̉	ı̊	c	e	
2	V	T	v	ı̋	T	t	ı̌	
3	G	U	g	ı̌	ı̍	u	ı̎	
4	D	Φ	d	ı̎	ı̏	φ	"	
5	E	X	e	ı̐	ı̑	x	ı̒	
6	Ж	Ц	ж	ı̒	ı̓	ц	ı̔	
7	З	Ч	з	ı̔	ı̕	ч	ı̖	
8	И	Ш	и	ı̖	ı̗	ш	ı̘	
9	Й	Щ	й	ı̙	ı̚	щ	ı̛	
A	К	Ь	к	ı̜	ı̝	ь	ı̟	
B	Л	Н	л	ı̞	ı̟	н	ı̡	
C	М	Ь	м	ı̠	ı̡	ь	ı̣	
D	Н	Э	н	ı̢	ı̣	э	ı̤	
E	О	Ю	о	ı̥	ı̦	ю	ı̧	
F	П	Я	п	ı̨	ı̩	я	ı̫	

**Code Page #774
Lithuanian**

Other characters are the same as those for Code Page #437.

	8	9	A	B	C	D	E	F
0	Ç	É	Á	■	Ł	ą	α	≡
1	Ù	Æ	Í	■	Ł	č	β	±
2	É	Æ	Ó	■	Ŧ	ę	Γ	λ
3	À	Ò	Ú	|	ł	ė	π	≤
4	Ä	Ö	Ŧ	|	-	į	Σ	”
5	À	Ò	Ŧ	À	ł	š	σ	“
6	À	Ù	Æ	Č	Ŧ	ų	μ	+
7	Ç	Ù	Ó	È	Ŧ	τ	τ	≈
8	È	ÿ	č	È	Ł	ž	Φ	°
9	ë	ö	ŗ	ł	ŗ	į	θ	•
A	è	ù	ŗ	ł	ŗ	γ	Ω	•
B	ï	φ	½	ł	ŗ	■	δ	√
C	í	£	¼	ł	ŗ	■	∞	n
D	ì	¥	;	ł	=	■	ø	²
E	À	Ŧ	«	Š	ł	■	ε	■
F	A	f	»	ł	ž	■	∩	

**Code Page #3001
Estonian1**

Other characters are the same as those for Code Page #437.

	8	9	A	B	C	D	E	F
0	Ç	É	Á	■	Ł	š	ó	-
1	Ù	Æ	Í	■	Ł	š	β	±
2	É	Æ	Ó	■	Ŧ	š	ó	=
3	À	Ò	Ú	|	ł	š	ó	¼
4	Ä	Ö	Ŧ	|	-	š	ó	¶
5	À	Ò	Ŧ	À	ł	ı	š	š
6	À	Ù	Æ	À	ā	ı	μ	+
7	Ç	Ù	Ó	À	ā	ı	z	.
8	È	ÿ	č	●	Ł	ı	z	°
9	ë	ö	●	ł	ŗ	ı	ı	”
A	è	ù	ŗ	ł	ŗ	γ	θ	•
B	ï	φ	½	ł	ŗ	■	θ	ı
C	í	£	¼	ł	ŗ	■	ı	³
D	ì	Ø	;	φ	=	ı	ı	²
E	À	×	«	¥	ł	ı	ı	■
F	A	f	»	ł	ı	■	ı	ı

**Code Page #3002
Estonian2**

Other characters are the same as those for Code Page #437.

	8	9	A	B	C	D	E	F	
0					•	À	Š	à	š
1			;	±	À	Ŧ	á	ñ	
2			φ	²	À	ò	ä	ò	
3			£	³	À	ó	ã	ó	
4			¤	´	À	ô	ä	ô	
5			¥	μ	À	õ	ä	õ	
6			ı	¶	À	ö	æ	ö	
7			š	•	Ç	×	ç	+	
8			”	,	È	Ø	è	ø	
9			●	ı	È	Ù	é	ù	
A			æ	∞	È	Ú	é	ú	
B			«	»	È	Û	ë	û	
C			ŗ	¼	ı	Ü	ı	ü	
D				½	ı	Ý	ı	ý	
E			●	¾	ı	Ž	ı	ž	
F			-	č	ı	ß	ı	ı	

**Code Page #3011
Latvian1**

Other characters are the same as those for Code Page #437.

	8	9	A	B	C	D	E	F
0	Ç	É	Á	■	Ł	š	α	È
1	Ù	Æ	Í	■	Ł	Ŧ	β	È
2	É	Æ	Ó	■	Ŧ	č	Γ	Ģ
3	À	Ò	Ú	|	ł	Č	π	ķ
4	Ä	Ö	Ŧ	|	-	č	Σ	ķ
5	À	Ò	Ŧ	À	ł	č	σ	ļ
6	À	Ù	Æ	ł	ā	č	μ	ļ
7	Ç	Ù	Ó	ł	ŗ	ı	τ	ž
8	È	ÿ	č	ŗ	Ł	ı	Φ	ž
9	ë	ö	ŗ	ł	ŗ	į	θ	•
A	è	ù	ŗ	ł	ŗ	γ	Ω	•
B	ï	φ	½	ł	ŗ	■	δ	√
C	í	£	¼	ł	ŗ	■	∞	N
D	ì	¥	;	ł	=	ū	ø	š
E	À	Ŧ	«	ł	ŗ	ū	ε	■
F	A	f	»	ł	č	■	∩	

**Code Page #3012
Latvian2**

Other characters are the same as those for Code Page #437.

	8	9	A	B	C	D	E	F
0	А	Р	а	р	Л	С	р	Е
1	Б	С	б	с	л	с	е	±
2	В	Т	в	т	т	ѐ	џ	λ
3	Г	У	г	у	т	ѐ	џ	κ
4	Д	Ф	д	ф	л	ѐ	џ	Σ
5	Е	Х	е	х	л	ѐ	џ	σ
6	Ж	Ц	ж	ц	л	ѐ	џ	μ
7	З	Ч	з	ч	л	ѐ	џ	τ
8	И	Ш	и	ш	л	ѐ	џ	°
9	Й	Щ	й	щ	л	ѐ	џ	•
A	К	Ъ	к	ъ	л	ѐ	џ	•
B	Л	Н	л	н	л	ѐ	џ	√
C	М	Ь	м	ь	л	ѐ	џ	∞
D	Н	Э	н	э	л	ѐ	џ	²
E	О	Ю	о	ю	л	ѐ	џ	ε
F	П	Я	п	я	л	ѐ	џ	∩

**Code Page #3021
Bulgarian**

Other characters are the same as those for Code Page #437.

	8	9	A	B	C	D	E	F
0	А	Р	а	р	Л	С	р	Е
1	Б	С	б	с	л	с	е	±
2	В	Т	в	т	т	ѐ	џ	λ
3	Г	У	г	у	т	ѐ	џ	κ
4	Д	Ф	д	ф	л	ѐ	џ	Σ
5	Е	Х	е	х	л	ѐ	џ	σ
6	Ж	Ц	ж	ц	л	ѐ	џ	μ
7	З	Ч	з	ч	л	ѐ	џ	τ
8	И	Ш	и	ш	л	ѐ	џ	°
9	Й	Щ	й	щ	л	ѐ	џ	•
A	К	Ъ	к	ъ	л	ѐ	џ	•
B	Л	Н	л	н	л	ѐ	џ	√
C	М	Ь	м	ь	л	ѐ	џ	∞
D	Н	Э	н	э	л	ѐ	џ	²
E	О	Ю	о	ю	л	ѐ	џ	ε
F	П	Я	п	я	л	ѐ	џ	∩

**Code Page #3031
Hebrew**

Other characters are the same as those for Code Page #437.

	8	9	A	B	C	D	E	F
0	א	ב	ג	ד	ה	ו	ז	ח
1	ט	י	כ	ל	מ	נ	ס	ע
2	פ	צ	ק	ר	ש	ת	י	ך
3	ך	ך	ך	ך	ך	ך	ך	ך
4	ך	ך	ך	ך	ך	ך	ך	ך
5	ך	ך	ך	ך	ך	ך	ך	ך
6	ך	ך	ך	ך	ך	ך	ך	ך
7	ך	ך	ך	ך	ך	ך	ך	ך
8	ך	ך	ך	ך	ך	ך	ך	ך
9	ך	ך	ך	ך	ך	ך	ך	ך
A	ך	ך	ך	ך	ך	ך	ך	ך
B	ך	ך	ך	ך	ך	ך	ך	ך
C	ך	ך	ך	ך	ך	ך	ך	ך
D	ך	ך	ך	ך	ך	ך	ך	ך
E	ך	ך	ך	ך	ך	ך	ך	ך
F	ך	ך	ך	ך	ך	ך	ך	ך

**Code Page #3041
Maltese**

Other characters are the same as those for Code Page #437.

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

**Code Page #3850
Standard KU**

Other characters are the same as those for Code Page #437.

	8	9	A	B	C	D	E	F
0	ร	อ	ฌ	ย	เ	.	ง	
1	จ	อ	ก	ฌ	ร	แ	ย	ง
2	L	ข	ช	ด	ถ	โ	ฌ	ง
3	J	ต	ค	ด	ล	ใ	+	ง
4	|	ค	ฆ	ถ	ว	ไ	ร	ง
5	-	ค	ง	ท	ศ	ฏ	อ	ง
6	+	ว	จ	ช	ษ	ฏ	อ	ง
7	+	ฌ	ฉ	น	ส	'	ง	ง
8	±	ค	ช	บ	ท	ย	ง	ง
9	T	ค	ช	ป	พ	๗	อ	ง
A	+	ช	ฉ	น	ฉ	๗	อ	ง
B	█	ค	ฌ	ฌ	ฌ	๗	อ	ง
C	↑	จ	ถ	พ	๗	๗	อ	ง
D	↑	จ	ถ	พ		๗	อ	ง
E	→	จ	ถ	ฌ	ถ	๗	อ	ง
F	↓	เ	ท	ม	ำ	ค	ง	

**Code Page #3860
Rajvitee KU**

Other characters are the same as those for Code Page #437.

	8	9	A	B	C	D	E	F
0	อ		ฌ	ย	เ	.	ง	
1	อ		ก	ฌ	ร	แ	ย	ง
2	ข		ช	ด	ถ	โ	ฌ	ง
3	ต		ค	ด	ล	ใ	+	ง
4	ค		ฆ	ถ	ว	ไ	ร	ง
5	ค	ร	ง	ท	ศ	ฏ	อ	ง
6	ว	T	จ	ช	ษ	ฏ	อ	ง
7	ฌ	↑	ฉ	น	ส	'	ง	ง
8	ค	↑	ช	บ	ท	ย	ง	ง
9	ค	+	ช	ป	พ	๗	อ	ง
A		+	ช	ฉ	น	๗	อ	ง
B		L	ค	ฌ	ฌ	๗	อ	ง
C	↑	±	จ	ถ	พ	๗	อ	ง
D	↑	J	จ	ถ	พ		๗	อ
E	→	|	จ	ถ	ฌ	ถ	๗	อ
F	↓	-	ท	ม	ำ	ค	ง	

**Code Page #3861
Microwiz KU**

Other characters are the same as those for Code Page #437.

	8	9	A	B	C	D	E	F
0		อ	ฌ	ย	เ	.	ง	
1		อ	ก	ฌ	ร	แ	ย	ง
2		ข	ช	ด	ถ	โ	ฌ	ง
3		ต	ค	ด	ล	ใ	+	ง
4		ค	ฆ	ถ	ว	ไ	ร	ง
5		ค	ง	ท	ศ	ฏ	อ	ง
6		ว	จ	ช	ษ	ฏ	อ	ง
7		ฌ	ฉ	น	ส	'	ง	ง
8		ค	ช	บ	ท	ย	ง	ง
9	#	ค	ช	ป	พ	๗	อ	ง
A	ร	+	ช	ฉ	น	๗	อ	ง
B	จ		ค	ฌ	ฌ	๗	อ	ง
C	L	±	จ	ถ	พ	๗	อ	ง
D	J	T	จ	ถ	พ		๗	อ
E	|	+	จ	ถ	ฌ	ถ	๗	อ
F	-	+	ท	ม	ำ	ค	ง	

**Code Page #3863
STD988 TIS**

Other characters are the same as those for Code Page #437.

	8	9	A	B	C	D	E	F
0	๗	ง	ฌ	ถ	๗	๗	อ	๗
1	๗	ง	ก	ท	ม	๗	๗	๗
2	๗	ง	ช	ฌ	ย	ำ	โ	๗
3	๗	ง	ค	ฌ	ร	ำ	ใ	๗
4	๗	ง	ค	ด	ถ	๗	๗	๗
5	๗	ง	ค	ด	ล	๗	๗	๗
6	๗	ง	ฆ	ถ	ว	๗	๗	๗
7	๗	ง	ค	ง	ท	ว	๗	๗
8	๗	ง	จ	ช	ศ	'	๗	๗
9	๗	ง	ค	ช	ป	๗	๗	๗
A	๗	ง	จ	ช	บ	๗	๗	๗
B	๗	ง	L	ช	ป	๗	๗	๗
C	๗	ง	J	จ	ถ	๗	๗	๗
D	๗	ง	|	จ	ถ	๗	๗	๗
E	๗	ง	+	จ	ถ	๗	๗	๗
F	๗	ง	-	ท	ม	๗	๗	๗

**Code Page #3864
Popular TIS**

Other characters are the same as those for Code Page #437.

	8	9	A	B	C	D	E	F
0	ร	ร	ร	ภ	ภ	เ	เ	เ
1	ก	ก	ก	ท	ท	ม	ม	ม
2	ล	ล	ช	ช	ช	จ	จ	จ
3	จ	ช	ช	ช	ร	ร	ร	ร
4	ข	ข	ค	ค	ค	ค	ค	ค
5	ค	ค	ค	ค	ค	ค	ค	ค
6	ค	ค	ค	ค	ค	ค	ค	ค
7	ค	ค	ค	ค	ค	ค	ค	ค
8	ค	ค	ค	ค	ค	ค	ค	ค
9	ค	ค	ค	ค	ค	ค	ค	ค
A	ค	ค	ค	ค	ค	ค	ค	ค
B	ค	ค	ค	ค	ค	ค	ค	ค
C	ค	ค	ค	ค	ค	ค	ค	ค
D	ค	ค	ค	ค	ค	ค	ค	ค
E	ค	ค	ค	ค	ค	ค	ค	ค
F	ค	ค	ค	ค	ค	ค	ค	ค

**Code Page #3865
Newsic TIS**

Other characters are the same as those for Code Page #437.

	8	9	A	B	C	D	E	F
0	ร	ร	ร	ภ	ภ	เ	เ	เ
1	ก	ก	ก	ท	ท	ม	ม	ม
2	ล	ล	ช	ช	ช	จ	จ	จ
3	จ	ช	ช	ช	ร	ร	ร	ร
4	ข	ข	ค	ค	ค	ค	ค	ค
5	ค	ค	ค	ค	ค	ค	ค	ค
6	ค	ค	ค	ค	ค	ค	ค	ค
7	ค	ค	ค	ค	ค	ค	ค	ค
8	ค	ค	ค	ค	ค	ค	ค	ค
9	ค	ค	ค	ค	ค	ค	ค	ค
A	ค	ค	ค	ค	ค	ค	ค	ค
B	ค	ค	ค	ค	ค	ค	ค	ค
C	ค	ค	ค	ค	ค	ค	ค	ค
D	ค	ค	ค	ค	ค	ค	ค	ค
E	ค	ค	ค	ค	ค	ค	ค	ค
F	ค	ค	ค	ค	ค	ค	ค	ค

Appendix E: Printer Control Codes

This appendix lists the printer's control commands. It gives the name of each control command, along with the applicable emulation mode (Standard and IBM), and the applicable ASCII code.

Standard Mode

ASCII Code	Function
BEL	Beeper
BS	Backspace
HT	Tab horizontally
LF	Line feed
VT	Tab vertically
FF	Form feed
CR	Carriage return
SO	Select double width printing (1 line)
SI	Select condensed printing
DC1	Select printer
DC2	Cancel condensed printing
DC3	Deselect printer
DC4	Cancel double width printing (1 line)
CAN	Cancel line
ESC LF	Reverse feed by current line space
ESC FF	Reverse form feed
ESC SO	Select double width printing (1 line)
ESC SI	Select condensed printing
ESC EM <i>n</i>	Control cut-sheet feeder (printer ignores this code)
ESC SP	Set inter character space
ESC ! <i>n</i> <i>n</i> = 00 01 02 04 08 10 20 40 80	Master select 10 cpi (ESC P) 12 cpi (ESC M) Proportional (ESC p) Condensed (SI) Emphasised (ESC E) Double-strike (ESC G) Double-wide expanded (ESC W) Italic (ESC 4) Underlining (ESC -)
ESC #	Cancel MSB control

Standard Mode

ASCII Code	Function
ESC 6	Enable printing of upper control codes (Character Set #2)
ESC 7	Enable upper control codes (Character Set #1)
ESC 8	Disable paper out detector
ESC 9	Enable paper out detector
ESC <	Unidirectional mode (1 line)
ESC =	Set MSB to 0
ESC >	Set MSB to 1
ESC ? <i>n m</i>	Reassign bit-image mode
ESC @	Initialise printer
ESC A <i>n</i>	Set <i>n</i> /60" line spacing
ESC B <i>d</i> ₁ . . . <i>d</i> _{<i>k</i>} 00	Set vertical tab
ESC C <i>n</i>	Set page length in lines
ESC C 0 <i>n</i>	Set page length in inches
ESC D <i>n</i> ₁ . . . <i>n</i> _{<i>k</i>} 00	Set horizontal tab
ESC E	Select bold font
ESC F	Cancel bold font
ESC G	Select double strike printing
ESC H	Cancel double strike printing
ESC J <i>n</i>	Advance print position vertically
ESC K <i>n</i> _L <i>n</i> _H <i>d</i> ₁ . . . <i>d</i> _{<i>k</i>}	Select 60 dpi graphics
ESC L <i>n</i> _L <i>n</i> _H <i>d</i> ₁ . . . <i>d</i> _{<i>k</i>}	Select 120 dpi graphics
ESC M	Select 12 cpi
ESC N <i>n</i>	Set bottom margin
ESC O	Cancel bottom margin
ESC P	Select 10 cpi
ESC Q <i>n</i>	Set right margin

Standard Mode

ASCII Code	Function
ESC R <i>n</i> <i>n</i> = 00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 40	Select an international character set #0 U.S.A. #1 France #2 Germany #3 England #4 Denmark I #5 Sweden #6 Italy #7 Spain I #8 Japan #9 Norway #10 Denmark II #11 Spain II #12 Latin America #13 Korea #14 Irish #64 Legal
ESC S <i>n</i> <i>n</i> = 00 01	Select superscript/subscript printing Superscript Subscript
ESC T	Cancel superscript/subscript printing
ESC U <i>n</i> <i>n</i> = 00 01	Turn unidirectional mode on/off Unidirectional Bi-directional
ESC W <i>n</i> <i>n</i> = 00 01	Turn double width printing on/off Turns off double-width Turns on double-width
ESC Y <i>n_L</i> <i>n_H</i> <i>d₁</i> . . . <i>d_k</i>	Select 120 dpi double speed graphics
ESC Z <i>n_L</i> <i>n_H</i> <i>d₁</i> . . . <i>d_k</i>	Select 240 dpi graphics

Standard Mode

ASCII Code	Function
ESC [T 04 00 00 00 n_1 n_2 n_1 n_2 = 01 B5 03 52 03 5C 03 5D 03 5F 03 61 03 62 0F 00 0F 01 0F 03 0F 04 0F 05 0F 06 0F 07 0F 08 03 54 03 E9 02 E1 03 53 03 65 03 A0 07 D1 03 04 03 06 0B B9 0B BA 0B C3 0B C4 0B CD 0B D7 0B E1 0F 0A 0F 14 0F 15 0F 17 0F 18 0F 19	Select code page #437 USA #850 Multi-lingual #860 Portuguese #861 Icelandic #863 Canadian French #865 Nordic #866 Russian #3840 IBM-Russian #3841 Gost #3843 Polish #3844 CS2 #3845 Hungarian #3846 Turkish #3847 Brazil-ABNT #3848 Brazil-ABICOMP #852 Latin-2 #1001 Arabic #737 Greek #737 #851 Greek #851 #869 Greek #869 #928 Greek #928 #2001 Lithuanian-KBL #772 Lithuanian #772 #774 Lithuanian #774 #3001 Estonian-1 #3002 Estonian-2 #3011 Latvian-1 #3012 Latvian-2 #3021 Bulgarian #3031 Hebrew #3041 Maltese #3850 Standard KU #3860 Rajvitee KU #3861 Microwiz KU #3863 STD 988 TIS #3864 Popular TIS #3865 Newscis TIS
ESC \ n_L n_H	Move relative horizontal print position
ESC b m n_1 . . . n_k 00	Set vertical tab in VFU channels
ESC g	Select 15 cpi
ESC h n n = 00 01 02	Select 1×1, 2×2, 4×4 sized printing Cancels enlargement Select double-high, double-wide (2×2) Select quadruple-high, quadruple-wide (4×4)
ESC j n	Advance reverse feed
ESC k n n = 00 01 02 03 05 07	Select typeface Roman Sanserif Courier Prestige OCR-B Orator

Standard Mode

ASCII Code	Function
ESC l n	Set left margin
ESC p n n = 00 01	Turn proportional mode on/off Returns to current fixed character pitch Selects proportional spacing
ESC q n n = 00 01 02 03	Select character style Cancel shadow/outline printing Set outline printing Set shadow printing Set shadow & outline printing
ESC r n	Select printer color
ESC t n n = 00 01 02	Select character table Select italic character table Select code page table set by EDS Setting Set download character in "00H-7FH" to "80H-FFH"
ESC w n n = 00 01	Turn double high printing on/off Turns on double-width Turns off double-width
ESC x n n = 00 01	Select LQ or Draft Draft LQ
ESC Z n n = 00 01	Select HS-Draft or Draft Draft HS-Draft
FS 3 n	Set line spacing to n/360"
FS @	Initialise printer
FS C n n = 00 01 02 03 05 07	Select typeface Roman Sanserif Courier Prestige OCR-B Orator
FS E n n = 00 01 02	Select double, triple width printing Cancel expanded print (ESC W 0) Select double-wide print (ESC W 1) Select triple-wide print
FS F	Select forward feed
FS I	Select character table
FS R	Select reverse feed
FS V n n = 00 01	Turn double high printing on/off Cancel double-high mode Select double-high mode
FS Z n _L n _H d ₁ . . . d _k	Select 360 dpi graphics
FS \ n _L n _H	Print characters from all character chart

Standard Mode

ASCII Code	Function
FS ^	Print a character from all character chart
DEL	Delete last character in buffer

IBM Mode

ASCII Code	Function
BEL	Beeper
BS	Backspace
HT	Tab horizontally
LF	Line feed
VT	Tab vertically
FF	Form feed
CR	Carriage return
SO	Select double width printing (1 line)
SI	Select condensed printing
DC1	Select printer
DC2	Select 10 cpi
DC4	Cancel double width printing (1 line)
CAN	Cancel line
ESC - n $n = 00$ 01	Turn under line on/off Cancel underlining Select underlining
ESC 0	Select 1/8" line spacing
ESC 1	Select 7/72" line spacing
ESC 2	Execute "ESC A" definition
ESC 3 n	Select $n/216$ " or $n/180$ " line spacing
ESC 4	Set top of form to the current position
ESC 5 n $n = 00$ 01	Turn automatic line feed on/off Automatic line feeding stops Automatic line feeding starts
ESC 6	Enable printing of upper control codes (Character Set #2)
ESC 7	Enable upper control codes (Character Set #1)
ESC :	Select 12 cpi
ESC A n	Define line spacing to $n/72$ "
ESC B $n_1 \dots n_k 00$	Set vertical tab
ESC C n	Set page length in lines
ESC C 0 n	Set page length in inches
ESC D $n_1 \dots n_k 00$	Set horizontal tab
ESC E	Select bold font
ESC F	Cancel bold font
ESC G	Select double strike printing

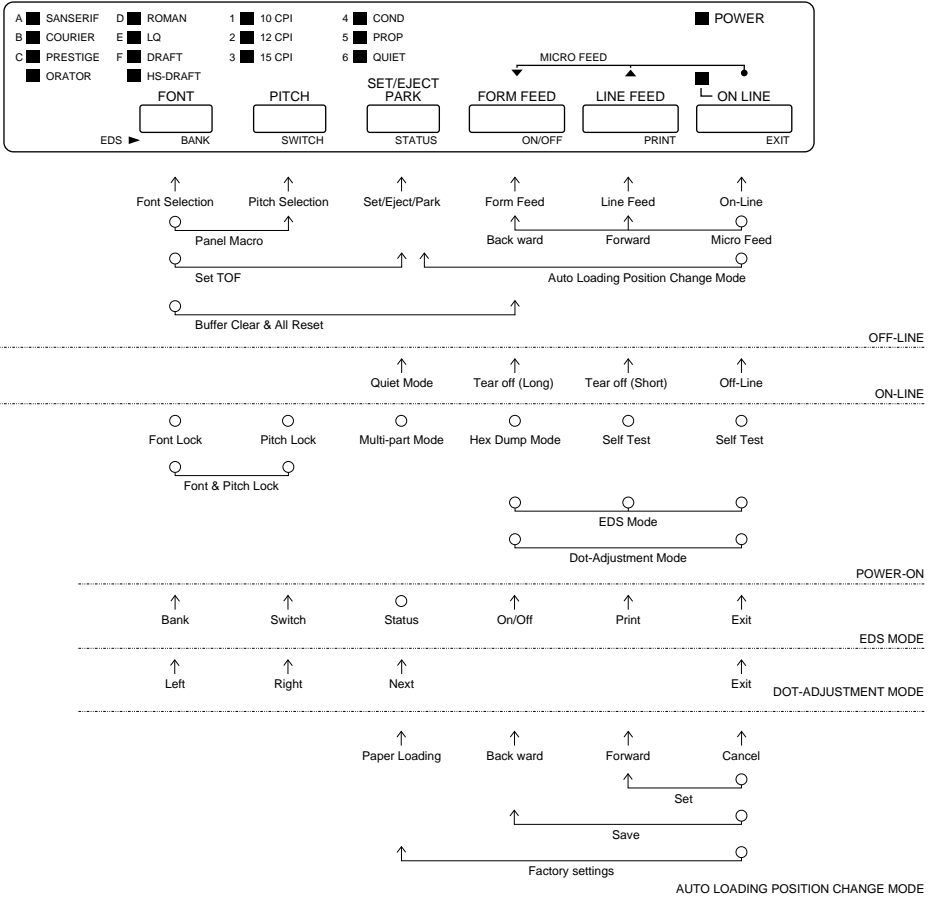
IBM Mode

ASCII Code	Function
ESC H	Cancel double strike printing
ESC I <i>n</i> <i>n</i> = 00 08 10 02 0A 12 03 04 0C 14 06 0E 16 07	Select print pitch and download Resident draft pica Resident draft elite Resident draft condensed Default LQ pica Default LQ elite Default LQ condensed Default LQ proportional Download draft pica Download draft elite Download draft condensed Download LQ pica Download LQ elite Download LQ condensed Download LQ proportional
ESC J <i>n</i>	Advance print position vertically
ESC K <i>n_L</i> <i>n_H</i> <i>d₁</i> . . . <i>d_k</i>	Select 60 dpi graphics
ESC L <i>n_L</i> <i>n_H</i> <i>d₁</i> . . . <i>d_k</i>	Select 120 dpi graphics
ESC N <i>n</i>	Set bottom margin
ESC O	Cancel bottom margin
ESC P <i>n</i> <i>n</i> = 00 01	Turn proportional mode on/off Cancel proportional printing Select proportional printing
ESC Q <i>n</i>	Deselect printer
ESC R	Set all tabs to power on defaults
ESC S <i>n</i> <i>n</i> = 00 01	Select superscript/subscript printing Select Superscript Select Subscript
ESC T	Cancel superscript/subscript printing
ESC U <i>n</i> <i>n</i> = 00 01	Turn unidirectional mode on/off Select bi-directional mode Select unidirectional mode
ESC W <i>n</i> <i>n</i> = 00 01	Turn double width printing on/off Cancel expanded print Select expanded print
ESC X <i>n_L</i> <i>n_H</i>	Set left and right margins
ESC Y <i>n_L</i> <i>n_H</i> <i>d₁</i> . . . <i>d_k</i>	Select 120 dpi double speed graphics
ESC Z <i>n_L</i> <i>n_H</i> <i>d₁</i> . . . <i>d_k</i>	Select 240 dpi graphics
ESC [@ <i>n_L</i> <i>n_H</i> <i>m₁</i> . . . <i>m_k</i>	Control width, high and line spacing
ESC [K <i>n_L</i> <i>n_H</i> <i>init id p₁</i> <i>P₂</i>	Set initial condition

IBM Mode

ASCII Code	Function
ESC [T 04 00 00 00 n_1 n_2 n_1 n_2 = 01 B5 03 52 03 5C 03 5D 03 5F 03 61 03 62 0F 00 0F 01 0F 03 0F 04 0F 05 0F 06 0F 07 0F 08 03 54 03 E9 02 E1 03 53 03 65 03 A0 07 D1 03 04 03 06 0B B9 0B BA 0B C3 0B C4 0B CD 0B D7 0B E1 0F 0A 0F 14 0F 15 0F 17 0F 18 0F 19	Select code page #437 USA #850 Multi-lingual #860 Portuguese #861 Icelandic #863 Canadian French #865 Nordic #866 Russian #3840 IBM-Russian #3841 Gost #3843 Polish #3844 CS2 #3845 Hungarian #3846 Turkish #3847 Brazil-ABNT #3848 Brazil-ABICOMP #852 Latin-2 #1001 Arabic #737 Greek #737 #851 Greek #851 #869 Greek #869 #928 Greek #928 #2001 Lithuanian-KBL #772 Lithuanian #772 #774 Lithuanian #774 #3001 Estonian-1 #3002 Estonian-2 #3011 Latvian-1 #3012 Latvian-2 #3021 Bulgarian #3031 Hebrew #3041 Maltese #3850 Standard KU #3860 Rajvitee KU #3861 Microwiz KU #3863 STD 988 TIS #3864 Popular TIS #3865 Newscic TIS
ESC [\ n_L n_H m_1 m_2 m_3 m_4	Set base unit of line spacing
ESC [g n_L n_H m d_1 . . . d_k	Select graphic mode
ESC \ n_L n_H	Print characters from all character chart
ESC]	Reverse line feed
ESC ^	Print a character from all character chart
ESC _ n n = 00 01	Turn over-score on/off Cancel overscoring Select overscoring
ESC d n_L n_H	Move print position to the right
ESC j	Stop printing
ESC r n	Select print color

Appendix F: Control Panel Operation Guide



Note:

A dot means press and hold and an arrow means to just press. A dot and arrow tied together means hold one while pressing the other.

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