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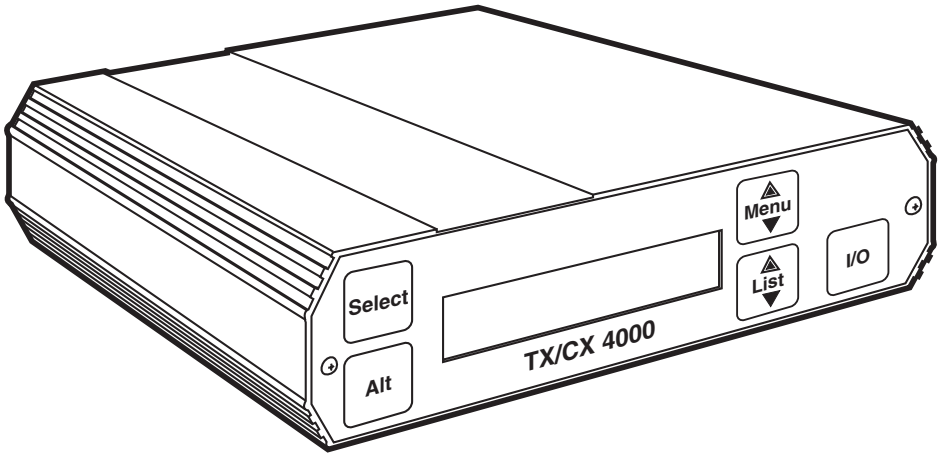
NETWORK SERVICES

OCTOBER 1995
PCA40A
PCA40AE

TX/CX 4000



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NORMAS OFICIALES MEXICANAS (NOM)
ELECTRICAL SAFETY STATEMENT

INSTRUCCIONES DE SEGURIDAD

1. Todas las instrucciones de seguridad y operación deberán ser leídas antes de que el aparato eléctrico sea operado.

2. Las instrucciones de seguridad y operación deberán ser guardadas para referencia futura.

3. Todas las advertencias en el aparato eléctrico y en sus instrucciones de operación deben ser respetadas.

4. Todas las instrucciones de operación y uso deben ser seguidas.

5. El aparato eléctrico no deberá ser usado cerca del agua—por ejemplo, cerca de la tina de baño, lavabo, sótano mojado o cerca de una alberca, etc..

6. El aparato eléctrico debe ser usado únicamente con carritos o pedestales que sean recomendados por el fabricante.

7. El aparato eléctrico debe ser montado a la pared o al techo sólo como sea recomendado por el fabricante.

8. Servicio—El usuario no debe intentar dar servicio al equipo eléctrico más allá a lo descrito en las instrucciones de operación. Todo otro servicio deberá ser referido a personal de servicio calificado.

9. El aparato eléctrico debe ser situado de tal manera que su posición no interfiera su uso. La colocación del aparato eléctrico sobre una cama, sofá, alfombra o superficie similar puede bloquea la ventilación, no se debe colocar en libreros o gabinetes que impidan el flujo de aire por los orificios de ventilación.

10. El equipo eléctrico deber ser situado fuera del alcance de fuentes de calor como radiadores, registros de calor, estufas u otros aparatos (incluyendo amplificadores) que producen calor.

11. El aparato eléctrico deberá ser connectado a una fuente de poder sólo del tipo descrito en el instructivo de operación, o como se indique en el aparato.

12. Precaución debe ser tomada de tal manera que la tierra fisica y la polarización del equipo no sea eliminada.

13. Los cables de la fuente de poder deben ser guiados de tal manera que no sean pisados ni pellizcados por objetos colocados sobre o contra ellos, poniendo particular atención a los contactos y receptáculos donde salen del aparato.

14. El equipo eléctrico debe ser limpiado únicamente de acuerdo a las recomendaciones del fabricante.

15. En caso de existir, una antena externa deberá ser localizada lejos de las lineas de energia.

16. El cable de corriente deberá ser desconectado del cuando el equipo no sea usado por un largo periodo de tiempo.

17. Cuidado debe ser tomado de tal manera que objectos liquidos no sean derramados sobre la cubierta u orificios de ventilación.

18. Servicio por personal calificado deberá ser provisto cuando:

    A: El cable de poder o el contacto ha sido dañado; u

    B: Objectos han caído o líquido ha sido derramado dentro del aparato; o

    C: El aparato ha sido expuesto a la lluvia; o

    D: El aparato parece no operar normalmente o muestra un cambio en su desempeño; o

    E: El aparato ha sido tirado o su cubierta ha sido dañada.

Contents

Chapter **Page**

1. Specifications

Hardware Requirements — ASCII parallel or serial printer

Software Requirements — No special host drivers needed

Emulation — AS/400 or System/3X twinax, or 3270-type coax printer

Systems Supported — AS/400, System/3X, 3270

Indicators — Front-panel LCD display

Connectors — (1) DB25 male serial out, (1) DB25 female parallel out, (1) DB9 twinax/coax, (1) DB25 female serial in, (1) 36-pin Centronics® female parallel in, (1) 12 V power connector

Temperature —*Operating:* 40° to 110° F (4° to 43° C), *Storage*: 32°to 158° F (0° to 70° C)

Maximum Relative Humidity — 85%, noncondensing

Power — *PCA40A*: 120 V, 60 Hz, 9 V output voltage, 1 A output current; *PCA40AE*: 230 V, 50 Hz, 9 V output voltage, 1 A output current

Size — 2"H x 6.4"W x 5.5"D (5.1 x 16.3 x 13.9 cm)

Weight — 3 lb. (1.4 kg)

2. Introduction

The TX/CX 4000 is a powerful yet easy-to-operate printer interface. It has a multitude of features that you can access through its front panel or by sending download commands from the host or PC. Since it senses which host adapter cable has been attached, the TX/CX 4000 automatically adjusts to the host environment.

The TX/CX 4000 is a twinax/coax interface that enables most ASCII parallel and serial printers to attach directly to an AS/400® or System/3X twinax host system, or 3270-type coax host system.

When connected to an HP® PCL® or compatible laser printer, the TX/CX 4000 can be configured to emulate the IBM 3812-1 (without IPDS) system laser printer.

For IBM Proprinter® II, III, PPDS, and Epson DFX+, DFX (9-pin), LQ (24-pin), and ESC/P2 type printers, IBM 4214-2, 5224-1, 5225-1, and 5256-3 (twinax) printer emulations are available. For coax printing 3287, 3268, 3262, 4214-1 and 4224 printer emulations are available. In addition, the TX/CX 4000 printer interface offers a generic (carriage return and line feeds) output protocol.

Standard connectors for both parallel and serial cables allow the TX/CX 4000 to change with your printing needs. The TX/CX 4000 allows printer sharing of up to two PCs (parallel and serial), an IBM coax or twinax host connection, and a choice of using a parallel or serial printer.

Unpacking

Check the packaging for water or physical damage, and notify the carrier immediately if any damage is evident. Keep the original packaging in case you need to move or ship the TX/CX 4000. The package should include the following:

- TX/CX 4000
- Wall-mount transformer (9-VAC output). The PCA40A comes with a 120-VAC input transformer and the PCA40AE comes with a 230-VAC input transformer.
- This user manual
- Auto-terminating twinax V-cable and 9-pin-to-coax adapter cable
- DB25 male-to-Centronics male cable
- DB25 male-to-female cross cable

3. Installation

Before connecting the TX/CX 4000 to the printer, verify that the printer functions properly by performing a printer self-test. Consult the printer's user's guide for instructions on how to start and evaluate the self-test. If the printer functions properly, follow these steps to install the TX/CX 4000.

1. Power off the printer.
2. Attach the parallel or serial cable from the interface to the printer.
3. Attach the 9-pin host cable adapter (twinax or coax) to the interface's connector. Do not attach the host cable(s) at this time.
4. Plug the 9V transformer into a standard 120-VAC outlet (for the PCA40A) or a 230-VAC outlet (for the PCA40AE).
5. Power on the interface by pressing the black I/O button. The TX/CX 4000's LCD screen should identify itself as a "5250 or 3270 Interface," indicating proper power. It will then display the message "Waiting for Printer OK."
6. During initial installation, review and set the configuration settings as necessary. Follow the configuration instructions in **Chapter 4** for twinax applications and **Chapter 6** for coax applications. To enter the configuration mode, press the blue MENU key.
7. After the desired parameters have been selected, power on the printer and print a self-test from the "Test Menu" or return to normal operation mode by pressing Select.
8. Attach the host system cable(s) and send a test print job to the TX/CX 4000 to verify proper installation.

Using the Front Panel

The LCD front panel is easy to configure and use. The functions of the front panel are as follows:

- *LCD Display*—This displays the current status of the TX/CX 4000 and is used to perform tests and configure the settings. During operational mode, the top line displays S3X/AS-400 (Twinax), 3270 Coax, and Host Communications Status (Sync or No Sync) mode. The lower line displays "Active Input" (left); "Output Printer" (center); and "Printer Status" (right).

- *Select*—While the operator is viewing different options, pressing "Select" will select the displayed option as the active option.

- *Alt*—Pressing "Alt" modifies the displayed option.

- *Menu*—Pressing "Menu" moves to the next menu group, if possible. When the TX/CX 4000 is in operating mode, pressing "Menu" places the TX/CX 4000 into configuration mode.

- *List*—Pressing "List" displays the next setup item.

- *I/O*—Powers the TX/CX 4000 ON and OFF.

A flow chart of the twinax front panel is shown in **Chapter 4**. A flow chart of the coax front panel is shown in **Chapter 6**.

The following is a tutorial for the TX/CX 4000 front panel. By completing this tutorial, you will have a better understanding of how the front panel operates in both twinax and coax mode.

1. Power on the TX/CX 4000 by pressing the I/O switch. A twinax or coax adapter cable must be attached, or an error message will be displayed. The TX/CX 4000 then proceeds to the normal operational mode, as noted in the LCD display.

2. Place the TX/CX 4000 in the front panel mode by pressing Menu.

3. The display now gives you the choice of returning to normal operation by pressing Select or proceeding to the configuration menus by pressing Menu. Press Menu to continue.

4. Enter the "Test Menu" by pressing List to list items in that menu, or proceed to the Setup menu by pressing Menu.

5. List the Setup Menu items by pressing List.

6. The first setup menu item in the twinax menu is “Twinax Address,” which is displayed on the top line. The first setup menu item in the coax menu is “Lines Per Inch.” Item options are shown on the second line. An asterisk in the first position indicates that the option is the current active selection.

   Press Alt repeatedly to display the available options.

   Press Select to select a displayed option as the active selection. An asterisk will appear in front of the chosen selection.

   Press List to list the next item in the Setup Menu.

   Press Menu to exit the Setup Menu and go to the next menu.

7. Follow the instructions in Step 6 above to review and change the menu item settings desired. When all changes have been made, press Menu until you reach the display allowing you to exit the configuration mode. Pressing Select will then return the TX/CX 4000 to normal operation.

The menu selections for the TX/CX 4000 and the option settings offered are shown in the Configuration chapters of this User’s Guide. The twinax menu appears in **Chapter 4**, and the coax menu appears in **Chapter 6**.

4. Configuration—Twinax

4.1 Host Configuration

Before operating the TX/CX 4000 in twinax mode, you must configure the IBM host with a cable address and device ID for the printer. See your system operator or system manuals for details. You must also set the twinax address on the TX/CX 4000.

Table 4-1 shows the recommended emulation and device ID on the different host systems.

Table 4-1. Emulation and Device IDs for Various Host Systems.

Host System	Printer Used	Emulation	Device ID
AS/400, S/38, S/36	Laser printer (using HP PCL commands)	3812	3812-1
AS/400, S/38, S/36	Matrix printer (printing NLQ)	4214	4214-2
AS/400, S/38, S/36 (S/34)	Matrix printer	5224	5224 (2P)
AS/400, S/38, S/36 S/34	Specialty printer (e.g., label printer)	5256	5256

You can configure the TX/CX 4000 through its front panel or by sending download commands from the host or from a PC/LAN. To ensure proper functioning of the TX/CX 4000, configure the BASIC SETUP parameters.

The following pages outline the main menu options with their accompanying host download command numbers shown to the left. To change any of the default options (shown with an asterisk (*) to the left of the option), press Alt, then Select to save the change. To make additional changes to other parameters within the current menu, press List.

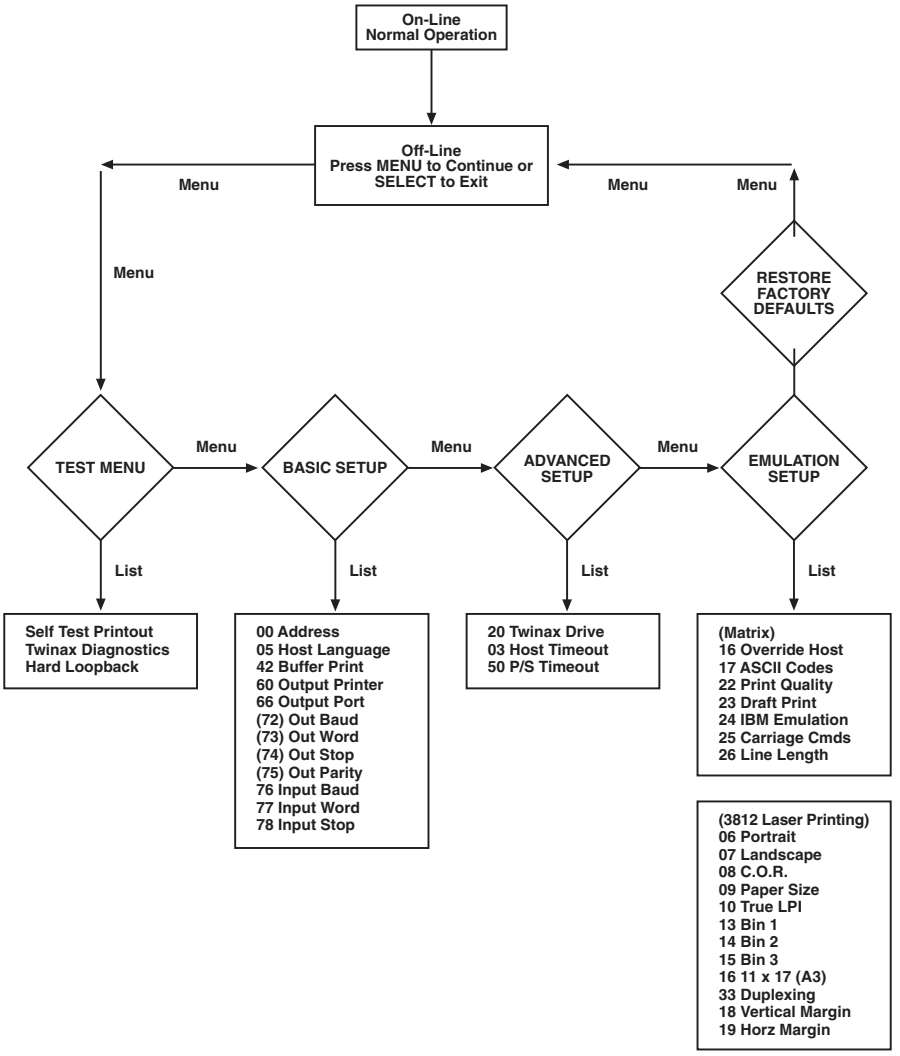

Figure 4-1. Twinax Setup Menu.

Test Menu
- Self Test Printout
- Twinax Diagnostics
- Hard Loopback Test

Self Test Active
Cycle power to end

Basic Setup Menu

[00] Twinax Address
- 0 to 6 — *0

[05] Host Language

*00-Multinational	08-France
01-U.S./Canada	09-Italy
02-Austria/German	10-Japan (English)
03-Belgian	11-Katakana (US)
04-Brazil	12-Portugal
05-Canada (French)	13-Spain
06-Denmark/Norway	14-Spanish Speaking
07-Finland/Sweden	15-United Kingdom

[42] Buffer Print
- *0-No
- 1-Yes

[60] Output Printer

0-IBM PPDS	6-EPSON LQ (24 pin)
1-EPSON ESC/P2	7-EPSON DFX+
2-HP-PCL 3812	8-EPSON FX (9 pin)
5-IBM Proprinter 1	*9-Generic Strings

[66] Output Port
- *0-Parallel
- 1-Serial

[76] Input Baud

0-38.4K	5-1200
1-19.2K	6-600
*2-9600	7-300
3-4800	9-Disabled
4-2400	

[77] Input Word
- 7-7 bits
- *8-8 bits

[78] Input Stop
- *1-1 bit
- 2-2 bits

[79] Input Parity
- *0-None
- 3-Even
- 1-Odd

Note: *Indicates factory defaults

Figure 4-2. Test Menu and Basic Setup Menu.

Advanced Setup Menu

[20]-Twinax Drive
*0-Normal 1-Star Panel Overdrive

[03] Host Timeout
1 to 99 *8

[50] P/S Timeout
1 to 99 *8

Emulation Setup Menu

[16] Override Host
*0-No Overrides 1-Override CPI &NLQ
2-Override NLQ 3-Override CPI

[17] ASCII Codes
0-HP Roman 8 *1-Code Page 850
2-Code Page 437

[22] Print Quality
*0-Default Draft 1-Default NLQ

[23] Draft Print
*0-Normal Draft 1-Fast Draft

[24] IBM Emulation
*0-5256 1-5224
2-5225 3-4214

[25] Carriage Cmds
*0-Use Form Feeds 1-FF by LFs
2-Ignore FFs 3-No CR/LF/FF

[26] Line Length
*0-Wrap beyond 8" 1-Truncate at 8"

Set Factory Defaults

Select-Restoring Factory Defaults
Are you sure? Press SELECT to continue
Restoring Factory

Menu-Press MENU to enter or SELECT to exit
Menu-Recycles to Test Menu
Select-Returns to on-line condition

Note: *Indicates factory defaults

Figure 4-3. Advanced Setup Menu, Emulation Setup Menu, and Set Factory Defaults.

4.2 Host/PC Download Commands

By sending download commands from the Host/PC to the TX/CX 4000, you can change all available configuration parameters.

NOTE

This section includes all configuration parameters accessible through the front panel, as well as additional parameters.

Host/PC download commands are placed in a Host/PC document or on the screen. The commands take effect when the print job or screen print is sent to the TX/CX 4000. The TX/CX 4000 checks data streams on all three in-ports (host, serial, parallel) for download commands. Whether the incoming print job is a screen print, a spreadsheet, or a word-processing document created on either host or PC, the interface will recognize the Host/PC download command. The command itself will not be printed if it was entered correctly. If any part of the command is printed, the TX/CX 4000 did not recognize the command because of a problem in the format. Check the syntax of the command and send it again.

You can send Host/PC downloads commands to the TX/CX 4000 that are not required for the active emulation. For example, if an output printer other than the HP LaserJet® PCL-4 (Command 60) is selected and a request for duplexing (Command 33) is sent, the duplexing command would be ignored, since it only functions with the HP LaserJet PCL-4 output printer.

Host/PC download commands sent to the 4000DX take effect immediately (unless otherwise noted) and stay only in the TX/CX 4000's active memory. To save the changed configuration as an active default configuration, you must send the Host/PC download command Z99,1.

NOTE

Save the Host/PC download commands in a separate file. If the TX/CX 4000 needs to be reconfigured at a later time or if you need to configure more than one TX/CX 4000, just "print" the file containing the selected Host/PC download commands.

Follow these steps to enter a host download command.

1. Type the Command Pass-Thru delimiter &% (or alternate CPT start delimiter as described in the table) in the document at the point where the command is to take effect.

2. Type an upper-case "Z."

3. Type the command number for the command to be used, as shown in **Table 4-2**.

4. Type a comma.

5. Type the command. No spaces are allowed. A space or invalid character in a command causes the TX/CX 4000 to ignore the command and resume printing from the point where the error occurred.

   For example, to change the Twinax Address from the default of 0 to 4, enter:

   &%Z00,4

6. Multiple commands can be chained together by using a slash (/) or backslash (\) to separate the commands (no spaces allowed). For example, to set the Output Printer (Command 60) to HP LaserJet PCL-4 (Option 2), the Output Port (Command 66) to Parallel (Option 0), and the Duplex Printing (Command 33) option to long-edge duplexing (Option 1), type:

   &%Z60,2\Z66,0\Z33,1

To ensure that the configuration is correct, review and, if necessary, modify at least the following configuration options.

4.3 Twinax Host/PC Download Commands

Table 4-2 shows the Twinax Host /PC Download command and its command number in alphabetical order. This table includes all configuration parameters accessible through the front panel, as well as additional parameters.

Table 4-2. Twinax Host/PC Download Commands.

Host/PC Download Command	Command Number
11" x 17" (A3) Paper Size	32
10 CPI String	86
12 CPI String	88
15 CPI String	87
16.7 CPI String	89
6 LPI String	84
8 LPI String	85
Alt CPT End Delimiters	02
Alt CPT Start Delimiters	01
ASCII Codes	17

Table 4-2. Twinax Host/PC Download Commands (continued).

Host/PC Download Command	Command Number
Auto Print Orientation	08
Buffer Print	42
Carriage Cmds	25
Draft Print	23
Duplexing	33
Horizontal Margin Adjust	19
Host Language	05
Host Timeout	03
IBM Emulation	24
Input Baud	76
Input Parity	79
Input Stop	78
Input Word	77
Landscape	07
Line Length	26

Table 4-2. Twinax Host/PC Download Commands (continued).

Host/PC Download Command	Command Number
Output Port	66
Output Printer	60
Override Format	16
P/S Timeout	50
Paper Drawer 3	15
Paper Drawer 1	13
Paper Drawer 2	14
Paper Size	09
Parallel Port Initialization	56
Portrait	06
Print Quality	22
Restore Factory Defaults	98
Serial Port Initialization	58
Serial Out Stop Bits	74
Serial Out Parity	75

Table 4-2. Twinax Host/PC Download Commands (continued).

Host/PC Download Command	Command Number
Serial Out Baud Rate	72
Serial Out Word Length	73
True LPI	10
Twinax Address	00
Twinax Drive	20
Twinax Port Initialization	11
User Defined Fonts	21
Vertical Margin Adjust	18

4.4 Configuration Options

Asterisks (*) identify factory-default settings. Invalid commands (such as selecting twinax address 9) are ignored; the last valid setting will be unchanged. Examples in this section apply only to configuration through twinax Host/PC Download.

COMMAND 00: TWINAX ADDRESS

Sets the twinax address.

VALUE	DESCRIPTION
0 to 6	Sets new twinax address

Example: &%Z00,4 sets twinax address to 4

COMMAND 01: ALTERNATE CPT START DELIMITER

Creates an alternate Command Pass-Thru (CPT) start delimiter. Also works as an alternate Host/PC download delimiter. May be one or two characters. The first character may be any printable character other than "&." Only one alternate CPT start delimiter is allowed.

VALUE	DESCRIPTION
New characters	Alternate CPT start delimiter
Two spaces	Deletes alternate CPT start delimiter

Example: &%Z01,#* creates the alternate CPT start delimiter #*.

COMMAND 02: ALTERNATE CPT END DELIMITER

Creates an alternate CPT end delimiter as above. This delimiter cannot be used as an alternate Host/PC download delimiter.

VALUE	DESCRIPTION
New characters	Alternate CPT end delimiter
Two spaces	Deletes the alternate delimiter

COMMAND 03: HOST TIMEOUT

Selects a new timeout value (in seconds) for the interface to wait for data from the host before allowing the printer to honor PC print jobs.

VALUE	DESCRIPTION
1 to 99	Sets new timeout value
* 8	Factory Default

Example: &%Z03,05 selects 5 seconds.

NOTE

If the timeout setting is too short (less than 4 seconds) it is possible that the interface will interpret an interruption of a host print job as an end of job and switch to PC/LAN printing.

COMMAND 05: HOST LANGUAGE

Selects the 3X/400 language to be used by the twinax host, when the command "Use Default Language" is received.

VALUE	DESCRIPTION
*00	Multinational
01	US/Canada
02	Austria/German
03	Belgian
04	Brazil
05	Canada (French)
06	Denmark/Norway
07	Finland/Sweden
08	France
09	Italy
10	Japan (English)
11	Katakana (US)
12	Portugal
13	Spain
14	Spanish speaking
15	United Kingdom

Example: &%Z05,00 selects the multinational character set.

COMMAND 06: PORTRAIT ORIENTATION

3812 laser printing only. Selects or deselects portrait print orientation.

VALUE	DESCRIPTION
*0	Portrait not selected
1	Portrait selected

NOTE

To select COR, both Host/PC download commands 06 and 07 must be set to value 0. To select COR, but allow host override, set both Host/PC download commands 06 and 07 to value 1.

Example: &%Z06,1 selects portrait; &%Z06,1\Z07,1 is COR selected, but host is able to override COR

COMMAND 07: LANDSCAPE ORIENTATION

3812 laser printing only. Selects or deselects landscape print orientation.

VALUE	DESCRIPTION
*0	Landscape not selected
1	Landscape selected

NOTE

To select COR, set both Host/PC download commands 06 and 07 to value 0. To select COR, but allow host override, set both Host/PC download commands 06 and 07 to value 1.

Example: &%Z07,1 selects landscape

COMMAND 08: AUTOMATIC PRINT ORIENTATION

3812 laser printing only. Selects or deselects automatic print orientation (APO).

VALUE	DESCRIPTION
*0	Deselect
1	Select

Example: &%Z08,1 selects automatic print orientation.

COMMAND 09: PAPER SIZE

3812 laser printing only. Selects paper-size setting.

VALUE	DESCRIPTION
*0	Paper size specified by host software (default to letter size)
1	A4 size paper
2	Paper size installed in printer

Example: &%Z09,1 selects A4 size paper.

COMMAND 10: TRUE LPI

3812 laser printing only. Selects compressed or true LPI (lines per inch) printing. With compressed LPI, the 3812 emulation can fit 66 lines on an 11-inch page at 6 LPI.

VALUE	DESCRIPTION
*0	No, compressed LPI
1	Yes, true LPI
2	Xpoint Twinax Controller Compatibility

Example: &%Z10,1 selects true LPI.

NOTE

Use the last selection only if you are using XPoint software that has been configured to run with the XPoint Twinax Controller.

COMMAND 11: TWINAX PORT INITIALIZATION

Enters a twinax-port initialization string (in hex code, up to 25 bytes) that is sent to the printer after top-of-page processing on each page in 3812 emulation, or when the host becomes active after serial or parallel printing in matrix emulation. Consult the printer's user's guide for the available commands and proper hex values.

Example: &%Z11,0(1B266C3844) sets LPI to 8 LPI on a Lexmark 4039 laser printer.

COMMAND 13: PAPER 1 DRAWER

3812 laser printing only. Matches the host's Paper Drawer 1 command with a physical paper source from the printer. When the host sends a command to the printer to feed from paper drawer 1, the printer will feed from the paper source assigned to paper drawer 1. Consult the printer's user's guide for the available paper sources and their numbers.

VALUE	DESCRIPTION
1 to 6	Paper sources available on the printer
*1	Default

Example: &%Z13,5 assigns the optional 500-sheet cassette on an HP LaserJet 4 Plus to the host's paper drawer 1 command.

COMMAND 14: PAPER DRAWER 2

3812 laser printing only. Matches the host's Paper Drawer 2 command with a physical paper source from the printer. When the host sends a command to the printer to feed from paper drawer 2, the printer will feed from the paper source assigned to paper drawer 2. Consult the printer's user's guide for the available paper sources and respective numbers.

VALUE	DESCRIPTION
1 to 6	Paper sources available on the printer
*4	Default

Example: &%Z13,5 assigns the optional 500-sheet cassette on an HP LaserJet 4 Plus to the host's paper drawer 2 command.

COMMAND 15: PAPER DRAWER 3

3812 laser printing only. Matches the host's Paper Drawer 3 command with a physical paper source from the printer. When the host sends a command to the printer to feed from paper drawer 3, the printer will feed from the paper source assigned to paper drawer 3. Consult the printer's user's guide for the available paper sources and respective numbers.

VALUE	DESCRIPTION
1 to 6	Paper sources available on the printer
*5	Default

Example: &%Z13,5 assigns the optional 500-sheet cassette on an HP LaserJet 4 Plus to the host's paper drawer 3 command.

COMMAND 16: OVERRIDE FORMAT

Allow operator settings on the printer's front panel to override format commands coming from the host.

VALUE	DESCRIPTION
*0	No, do not override IBM format commands
1	Override CPI and NLQ
2	Override NLQ (Matrix only)
3	Override CPI (Matrix only)

Example: &%Z16,1 enables the front panel to override CPI & NLQ

COMMAND 17: ASCII CODES

Selects which character set will be used when both are available for the desired font. The character set selected is used as the underlying ASCII table for EBCDIC-to-ASCII translations. Consult the printer's user's guide to verify that the character set selected is also used by the printer(s) and the selected font is supported.

VALUE	DESCRIPTION
0	HP Roman 8 (HP PCL only)
*1	Code Page 850
2	Code Page 437 (not valid for HP PCL) (Matrix only)

Example: &%Z17,0 selects the HP Roman 8 character set

COMMAND 18: VERTICAL MARGIN ADJUST

3812 laser printing only. Adjusts the upper-left-corner starting vertical position for printing on the page in units of 1/60 of an inch.

VALUE	DESCRIPTION
-127 to 127	
*0	Default

Example: &%Z18,-20 moves printing on the page up 1/3 inch or 2 lines at 6 LPI

COMMAND 19: HORIZONTAL MARGIN ADJUST

3812 laser printing only. Adjusts the upper-left-corner starting horizontal position for printing on the page in units of 1/60 of an inch.

VALUE	DESCRIPTION
-127 to 127	
*0	Default

Example: &%Z19,12 moves printing on the page 1/5 inch right or 2 characters at 10 CPI

COMMAND 20: TWINAX DRIVE

Activates star panel overdrive to add to the signal strength when problems occur with passive star panels.

VALUE	DESCRIPTION
*0	Normal
1	Star Panel Overdrive

Example: &%Z20,1 activates star panel overdrive

COMMAND 21: USER FONT STRINGS

3812 laser printing only. The first number (0-9) is one of 10 available strings; the second number (0-65535) is the host font number. The characters shown in parentheses are sent to the printer when the host font number is received. Refer to the printer's user's guide or the documentation accompanying the font cartridge for a list of available fonts and their respective strings. Use the < character to indicate the ESCape character.

VALUE	DESCRIPTION
0-9	One of ten available strings
0-65535	Host font number

Example: &%Z21,3,12345(<(12U<(s0p12h10v1s3b6T)

This selects the third font string to be font #12345 and selects for a Lexmark printer:

12U = code page 850
0p = fixed spacing
12h = 12 pitch
10v = 10 point
1s = italic
3b = bold
6T = letter gothic

COMMAND 22: PRINT QUALITY

Matrix only. Defines the print quality when the host sends "default print quality" commands.

VALUE	DESCRIPTION
*0	Default Draft
1	Default NLQ

Example: &%Z22,1 sets NLQ printing as the default

COMMAND 23: DRAFT PRINT

Matrix only. Selects the Draft Printing mode when a draft print command comes from the host or from the TX/CX 4000.

VALUE	DESCRIPTION
*0	Normal draft
1	Fast Draft

NOTE

Fast Draft is not available on all printers.

Example: &%Z23,1 sets the printer to print Fast Draft

COMMAND 24: IBM EMULATION

Selects IBM printer emulation. If HP PCL output protocol is selected, the 3812 emulation is automatically selected, regardless of which output protocol was previously selected.

VALUE	DESCRIPTION
0	5256
1	5224
2	5225
*3	4214

Example: &%Z24,2 sets the active printer emulation to 5225

COMMAND 25: CARRIAGE CMDS

Matrix only. Manipulates the IBM motion command.

VALUE	DESCRIPTION
*0	Use form feeds when possible
1	Form feeds by line feeds only
2	Ignore form feeds
3	No CR/LF/FF

Example: &%Z25,1 sets the interface to count the lines specified through LPI settings and replace FF with multiple LF

COMMAND 26: LINE LENGTH

Matrix only. Sets the printer to wrap or truncate text lines longer than 8 inches.

VALUE	DESCRIPTION
*0	Wrap beyond 8”
1	Truncate at 8”

Example: &%Z26,1 Sets the printer to truncate at 8 inches. Text beyond 8 inches will be lost.

COMMAND 32: 11" x 17" (A3) PAPER SIZE

3812 laser printing only. Enables large 11" x 17" (A3) size paper to be selected.

VALUE	DESCRIPTION
*0	No
1	Yes

Example: &%Z32,1 Allows the printer to print on 11" x 17" paper.

COMMAND 33: DUPLEXING

3812 laser printing only. Sets the printer to duplexing mode. This applies only to printers with duplexing capabilities.

VALUE	DESCRIPTION
*0	None
1	Long-edge duplexing
2	Short-edge duplexing

Example: &%Z33,2 Sets the printer to duplex all host print jobs along the short edge of the paper.

COMMAND 42: BUFFER PRINT

Printer goes into buffer print mode. All data is printed in hex code, which allows the detection of any unwanted commands coming from the host.

VALUE	DESCRIPTION
*0	No action taken
1	Yes, start buffer print
2	Stop buffer print (only possible from parallel or serial ports)

Example: &%Z42,1 starts buffer print

COMMAND 50: P/S TIMEOUT

Selects the parallel or serial timeout value, the time interval before the interface automatically switches from the parallel or serial port to check for data from the host.

VALUE	DESCRIPTION
1 to 99	1 to 99 seconds
*8	Factory default

Example: &%Z50,10 sets the time interval to 10 seconds.

COMMAND 56: PARALLEL PORT INITIALIZATION STRING

Allows the user to define a parallel-port initialization string of up to 25 bytes, which is stored in the memory of the interface card. The string is sent to initialize the printer for parallel-port printing after host or serial printing has occurred. The string is only sent if activated through command 66. To aid in readability, a single space is allowed between hex bytes. Refer to **Section 5.3**.

VALUE	DESCRIPTION
1(up to 25 hex bytes)	Defines the init string
1()	Deletes init string
Example:	&%Z56,1() deletes the hex strings previously defined as parallel port initialization string

COMMAND 58: SERIAL PORT INITIALIZATION STRING

Allows the user to define a serial-port initialization string of up to 25 bytes. See command 56.

VALUE	DESCRIPTION
1(up to 25 hex bytes)	Defines the init string
1()	Deletes init string
Example:	&%Z56,1() deletes the hex strings previously defined as serial-port initialization string

COMMAND 60: OUTPUT PRINTER

Specifies the type of output printer the interface will be using when converting host commands.

Selecting the HP-PCL 3812 output protocol will automatically select the 3812 (non-IPDS) emulation (command 24). In this case, the front panel will not display the emulation options. A new setting will not be effective immediately: To activate the new output printer setting, cycle power on the TX/CX 4000.

VALUE	DESCRIPTION
0	IBM PPDS
1	EPSON ESC/P2
2	HP-PCL 3812
5	IBM Proprinter 1
6	EPSON LQ (24 pin)
7	EPSON DFX +
8	EPSON FX (9 pin)
*9	Generic Strings

Example: &%Z60,1 selects the Epson ESC/P2 protocol.

COMMAND 66: OUTPUT PORT

Selects the output port.

VALUE	DESCRIPTION
*0	Parallel port
1	Serial port
2	Parallel port and initialization of printer
3	Serial port and initialization of printer

Example: &%Z66,1 selects the serial port.

COMMAND 72: SERIAL OUT BAUD RATE

Selects the Baud Rate for data sent from the interface to the printer.
A new setting will not be effective immediately: To activate the new setting, cycle power on the TX/CX 4000.

VALUE	DESCRIPTION
0	38,400 baud
1	19,200 baud
*2	9,600 baud
3	4,800 baud
4	2,400 baud
5	1,200 baud
6	600 baud
7	300 baud

Example: &%Z72,0 sets the outgoing baud rate to 38,400.

COMMAND 73: SERIAL OUT WORD LENGTH

Selects the Word Length of data sent from the interface to the printer.
A new setting will not be effective immediately: To activate the new setting, cycle power on the TX/CX 4000.

VALUE	DESCRIPTION
7	7 Bits
*8	8 Bits

Example: &%Z73,7 sets the outgoing word length to 7 bits.

COMMAND 74: SERIAL OUT STOP BITS

Selects the number of Stop Bits of a data stream sent from the interface to the printer. A new setting will not be effective immediately: To activate the new setting, cycle power on the TX/CX 4000.

VALUE	DESCRIPTION
*1	1 Bit
2	2 Bits

Example: &%Z74,2 sets the number of Stop Bits to 2.

COMMAND 75: SERIAL OUT PARITY

Selects the Parity of a data stream sent from the interface to the printer.
A new setting will not be effective immediately: To activate the new setting, cycle power on the TX/CX 4000.

VALUE	DESCRIPTION
*0	None
1	Odd
2	Even

Example: &%Z75,2 sets the outgoing parity to even.

COMMAND 76: INPUT BAUD

Selects the baud rate for data received at the serial-in port. A new setting will not be effective immediately: To activate the new setting, cycle power on the TX/CX 4000.

VALUE	DESCRIPTION
0	38,400 baud
1	19,200 baud
*2	9,600 baud
3	4,800 baud
4	2,400 baud
5	1,200 baud
6	600 baud
7	300 baud
9	Disabled

Example: &%Z76,0 sets the receiving baud rate to 38,400.

COMMAND 77: INPUT WORD

Selects the word length of data received at the serial-in port. A new setting will not be effective immediately: To activate the new setting, cycle power on the TX/CX 4000.

VALUE	DESCRIPTION
7	7 Bits
*8	8 Bits

Example: &%Z77,7 sets the word length to 7 bits.

COMMAND 78: INPUT STOP

Selects the number of stop bits of a data stream received at the serial-in port. A new setting will not be effective immediately: To activate the new setting, cycle power on the TX/CX 4000.

VALUE	DESCRIPTION
*1	1 Bit
2	2 Bits

Example: &%Z78,2 sets the number of Stop Bits to 2.

COMMAND 79: INPUT PARITY

Selects the parity of a data stream received at the serial-in port. A new setting will not be effective immediately: To activate the new setting, cycle power on the TX/CX 4000.

VALUE	DESCRIPTION
*0	None
1	Odd
2	Even

Example: &%Z79,2 sets the parity to even.

COMMAND 84: 6 LPI STRING

Matrix only. Generic output protocol (see command 60). Defines the 6 LPI String. This string represents the printer-specific command to set the printer to 6 LPI. Consult the printer's user's guide for the appropriate hex value representing the 6 LPI command.

VALUE	DESCRIPTION
1	(max. 25 bytes of ASCII hex code)

NOTE

If this string has been defined by command 84, the string will be sent to the printer when the host selects 6 LPI and the Generic emulation is active.

Example: &%Z84,1(1B 32) assigns the 6 LPI command for an Epson LQ-2500 printer (hex value 1B 32) to the Host/PC download command 84.

COMMAND 85: 8 LPI STRING

Matrix only. Generic output protocol (see command 60). Defines the 8 LPI String. See command 84.

VALUE	DESCRIPTION
1	(max. 25 bytes of ASCII hex code)

Example: &%Z85,1(1B 30) assigns the 8 LPI command for an Epson LQ-2500 printer (hex value 1B 30) to the Host/PC download command 85.

COMMAND 86: 10 CPI STRING

Matrix only. Generic output protocol (see command 60). Defines the 10 CPI String. See command 84.

VALUE	DESCRIPTION
1	(max. 25 bytes of ASCII hex code)

Example: &%Z86,1(1B 50) assigns the 10 CPI command for an Epson LQ-2500 printer (hex value 1B 50) to the Host/PC download command 86.

COMMAND 87: 15 CPI STRING

Matrix only. Generic output protocol (see command 60). Defines the 15 CPI String. See command 84.

VALUE	DESCRIPTION
1	(max. 25 bytes of ASCII hex code)

Example: &%Z87,1(1B 67) assigns the 15 CPI command for an Epson LQ-2500 printer (hex value 1B 67) to the Host/PC download command 87.

COMMAND 88: 12 CPI STRING

Matrix only. Generic output protocol (see command 60). Defines the 12 CPI String. See command 84.

VALUE	DESCRIPTION
1	(max. 25 bytes of ASCII hex code)

Example: &%Z88,1(1B 4D) assigns the 12 CPI command for an Epson LQ-2500 printer (hex value 1B 4D) to the Host/PC download command 88.

COMMAND 89: 16.7 CPI STRING

Matrix only. Generic output protocol (see command 60). Defines the 16.7 CPI Command String. See command 84.

VALUE	DESCRIPTION
1	(max. 25 bytes of ASCII hex code)

Example: &%Z89,1(1B 10) assigns the 16.7 (actually: 17 CPI normal draft) CPI command for an IBM Proprinter X24E (hex value 1B 10) to the Host/PC download command 89.

COMMAND 98: RESTORE FACTORY DEFAULTS

VALUE	DESCRIPTION
*0	Restore Factory Default
1	Print Active Configuration Parameters
2	Restore Settings Previously Defined by User

Example: &%Z98,2 prints the active configuration parameters.

COMMAND 99: STORE CONFIGURATION IN PERMANENT MEMORY

Send this command after all desired host download configuration commands have been sent to the interface. It stores the active setup in the permanent memory of the interface so it will be in effect whenever the printer is powered on. Otherwise, active configuration commands are lost when the printer is turned off.

VALUE	DESCRIPTION
0	To complete the command, the value 0 must be used.

NOTES

Host download selections followed by a Command &%Z99,0 will be stored in permanent memory and active when the printer is turned on.

Only use Command &%Z99,0 when the host download selection needs to be permanently stored in the memory of the interface.

Example: &%Z99,0 Stores the currently active setup selections in the permanent memory of the interface.

5. Operation—Twinax

When the TX/CX 4000 is powered on, it checks for a proper 9-pin host attachment cable to determine which mode of operation is desired. If none is found, a message is shown on the front panel, and the TX/CX 4000 waits for a proper cable to be attached. It then looks for the output printer to be ready before beginning operation; however, you can enter front-panel mode without a printer attached.

5.1 Printer Sharing

The TX/CX 4000 allows the printer to automatically share printing from an attached PC or LAN (any parallel or serial source) and an IBM twinax host. The TX/CX 4000 uses a timeout between each print to select the next printing without changing cables or switches.

At the end of a host print job, the TX/CX 4000 waits for the specified Host Port Timeout period before it honors data streams coming in through the parallel or serial ports. You can set the Host Timeout period through Host/PC download command 03 or through the front panel.

After a parallel or serial print job is completed, the TX/CX 4000 will again wait for a period of time before it honors host print jobs. The P/S Timeout is set through Host/PC download command 50 or through the front panel.

If the PC print job is sent while a host job is printing, the printer responds as "busy" to the PC print request. The print job can be spooled through a spool program, sent to the printer when the host job is finished or if the PC's printer port is set for infinite retry through the DOS "Configure Printer" command (described in the DOS manual), the print job waits for the printer to be available to receive the data.

When the TX/CX 4000 is not processing a print job, the LCD display will read "Idle." The LCD display also shows whether the selected output port (parallel or serial) is READY or NOT READY. When the TX/CX 4000 is processing a print job it will indicate from which input port the print job is coming (host, serial, or parallel) and to which output port the print job is directed (serial or parallel).

5.2 PC/LAN Printing

The TX/CX 4000 offers a serial and a parallel port to share the printer with PCs or LANs. Simply connect the PC/LAN printer server to the parallel or serial port. You can use just one or both of these sharing ports.

All data streams received by the TX/CX 4000 will be directed to the output port specified through the active configuration. You can change the output port through the front panel or through Host/PC download command 66.

Unless the Host/PC download command 66 is placed on the first line in the first possible position of the document, the output port may be changed during a page or at the end. Select output port option 0 or 1, since the initialization feature only applies to switching printers during host printing.

5.3 Parallel and/or Serial Initialization

If you want to change the printer's configuration for shared printing (e.g. set it to PostScript® mode), use the parallel and/or serial initialization strings (Host/PC download commands 56 and 58 respectively). Consult the printer's user's guide for the ASCII hex values representing the desired configuration commands. Then store these commands in the TX/CX 4000's memory using Host/PC download commands 56 and/or 58.

After the host printing is completed, and before the print job from the parallel or serial shared port is sent to the printer, the interface will send this initialization string to the printer and configure it according to your instructions. However, the print job coming through the parallel/serial shared port might contain other printer instructions, thus overriding the parallel/serial initialization string.

5.4 Host Printing

The TX/CX 4000 will auto-detect which host environment (coax or twinax) to operate in by the adapter plugged into the 9-pin host connector. If no host adapter is connected to the TX/CX 4000, the front panel will display a message to connect one.

Depending on the IBM printer emulation selected, you will have access to all the features of the IBM printer the TX/CX 4000 is emulating. The TX/CX 4000 also needs to be told which output printer to use to convert EBCDIC data streams from the host into the ASCII format the printer can use.

In addition to the features of the emulated IBM printer, ASCII printers will often have other capabilities, which you can take advantage of using Command Pass-Thru.

5.5 Host Port Initialization

The TX/CX 4000 reconfigures the printer according to the active configuration settings after shared printing. If you want to modify the printer configuration further (for example, to select a different font for all host printing), take advantage of the host-port initialization string. Unlike the Parallel and Serial Shared Port Initialization Strings, which are usually overridden by commands coming with the PC/LAN print job, the Host Port Initialization String is not sent to the printer until after the interface has reconfigured the printer for host printing. In 3812 emulation, the Init String is sent at the beginning of each printed page, in all other emulations the Init String is sent at the beginning of the first host print job.

5.6 Connecting Two Printers

The TX/CX 4000 allows host print jobs to be sent to two different printers. Simply connect one printer via the parallel port and the other via the serial port to the interface. Verify the Serial Out Settings. Switch from one Output Port to the other by using the Host/PC download command 66 or by changing the Output Port settings through the TX/CX 4000's front panel.

If the 3812 emulation is not being run, it may be wise to select the Output Port options, including the Host Port Init String (Parallel and Init. or Serial and Init.). In 3812 emulation, the Host Port Init String is sent automatically at the beginning of each page. In any other emulation, it is only sent to the printer at the beginning of the first host print job. If you switch output ports during host printing, this would mean that the new printer is not initialized according to specification. By selecting the "and Init." option, you ensure that the Host Port Init String is sent to the printer at the beginning of the first print job after switching output ports.

5.7 Twinax Drive

For installations using twinax cabling, set the Star Panel Overdrive option to OFF (Front Panel: Twinax Drive; Host/PC download command 20).

If you have problems with dropping off-line when using a passive star panel and twisted-pair cabling, set the Star Panel Overdrive to ON. This increases the signal-driving capability of the interface.

5.8 Serial Printing

When printing to a serial printer, verify the current Serial Out settings: baud rate, word length, stop bits, and parity. The TX/CX 4000 does not offer handshaking settings. The TX/CX 4000 will send and receive XON and XOFF for software handshaking, as long as CTS is present. The TX/CX 4000 will not send or receive data without the presence of CTS.

The same is true for a serial connection to a PC, LAN printer server, or other ASCII device. The TX/CX 4000 will indicate to the PC, LAN printer server, or other ASCII device when it is ready to receive data and when it isn't, regardless of what handshaking method the PC, LAN printer server, or other ASCII device is using.

5.9 Laser Printer Operation

The IBM 3812-1 printer is a laser-type printer that provides font-changing capability, plus text rotation and compression features called Computer Output Reduction (COR) and Automatic Print Orientation (APO).

The TX/CX 4000 emulation of the 3812 provides bolding, underlining, superscripts and subscripts by recognizing the host commands for these features in the document. A shadow print for bolding is performed automatically on fixed-pitch fonts. For proportionally spaced (typographic) fonts, you must specify the font that is to be printed.

Like a 5219, the 3812 is configured with a default font ID on the host. Configure the most commonly used font as the system default, then change as necessary with a printer override or OCL command.

Table 5-1 shows which fonts can be used as system defaults for a System/36 or System/38 host.

Table 5-1. Data Processing Fonts—S/36 and S/38.

Typestyle Number	Font ID (Hex)	Pitch (CPI)	Description
05	05	10	Presentation
11	0B	10	Courier
13	0D	10	Courier
80	50	12	Prestige Elite
85	55	12	Courier
86	56	12	Prestige Elite
87	57	12	Letter Gothic
91	5B	12	Letter Gothic
158	9E	Prop.	Times Roman
159	9F	Prop.	Times Roman Bold
160	A0	Prop.	Helvetica
162	A2	Prop.	Helvetica Italic
223	DF	15	Letter Gothic

5.9.1 Changing Typestyles

The typestyle number (FGID) selected determines the font to be used. The system operator selects a default typestyle when the printer is configured on the host, but, a word processing program may also have a default typestyle. Since the default typestyle can vary depending on the system setup, ask the system operator if you have questions about the default typestyle on the system.

There are two ways to change typestyles:

- Select a typestyle number within the program or document
- Use Font Change commands in the document

Refer to the program manuals to change typestyles in the program. Font Change commands are placed in the document by the user (refer to **Section 5.9.2**). The four-character font command changes the text to the new font until you enter another Font Change command.

The host does not know that a font change has taken place, and may send the original font number to the printer at the beginning of each page. Therefore, the user may have to put a Font Change command at the beginning of each new page. If the pitch is changed, there may be formatting problems, since the host is still formatting each line according to the pitch of the original typestyle number. Text Management/38 does not allow more than one font change per line of text, so you must use Font Change commands when you need to change fonts in the middle of a line.

5.9.2 Font Change Commands

The Font Change commands allow fonts to be changed in the document without using host commands. The commands can be used in either data processing (RPG, BASIC programs, etc.) or in word-processing documents.

Font Change commands are useful for Text Management/38 users, since TM/38 does not allow more than one host font change per line.

You can place these commands anywhere in a document. A Font Change command consists of the "logical not" (¬) symbol, a capital "Q," and the typestyle number corresponding to the desired font.

You can use the "^" symbol in place of the logical not for non-US applications.

The Font Change command occupies space in the program or text, but it does not print. To change the font, insert a Font Change command at the beginning of the text where the change is to take place. For example, to bold the word "saves" in the following sentence (assuming the current font is Courier 12-pitch, and the printer is an HP LaserJet III) type:

Quality ¬Q88saves¬Q85 you time and money.

Here's how the print will look:

Quality `saves` you time and money.

The ¬Q85 following "saves" returns the printing to the original font.

5.9.3 Page Length

The printer prints up to 66 lines at 6 LPI in HP emulation mode (the line spacing will be compressed slightly to fit). The System/36 only allows 65 lines per page. If the last line or two of the page prints at the top of a new page, more lines per page have been formatted than can print.

5.9.4 Paper Size

Configure the printer's setup to the paper size used most. The TX/CX 4000 only recognizes these paper sizes:

- Letter Paper—8.5 x 11 in. (215.9 x 279.4 mm)
- A4 Paper—8.27 x 11.69 in. (210 x 297 mm)
- Legal Paper—8.5 x 14 in. (215.9 x 355.6 mm)
- Executive Paper—7.25 x 10.5 in. (184.2 x 266.7 mm)
- 11" x 17" Paper—11 x 17 in. (279.4 x 431.8 mm)
- A3 Paper—11.69 x 16.54 in (296.9 x 420.1 mm)

If you choose other paper dimensions in a word-processing program, the TX/CX 4000 ignores them and uses the previous paper-size choice.

You can also choose a paper-size override through a host download command, front-panel selection as described in **Chapter 4, Configuration**. The "Any Paper Size" selection uses the paper installed in the tray, regardless of size. The "A4 Size" selection uses A4 paper only.

The following describes how to select legal-size paper in DisplayWrite/36 or OfficeVision/400.

1. Choose legal-size paper on the host and send the print job.

2. The printer's operator panel displays "Load paper, Tray #, Legal." Install the legal-size paper tray in the printer, and the printer will start printing. You can press Continue on the printer operator panel to print on currently loaded paper and not wait for the legal-size tray.

3. The System/38 sends margins and other format specifications to a printer only when they are different from the previous document or when the printer has been turned off. To choose a different size paper, you must:

a. Select a paper size in the program.

b. Install the correct paper size in the printer.

c. Power the printer off for about five seconds, then power it back on again.

4. Release the job for printing at the printer's controlling workstation.

The line format screens in DisplayWrite/36 (Command 20) also permit you to select "Justify," which aligns the right margin. The interface supports justification for fixed fonts only. For best results using justification, change the zone width to 1 (instead of 6).

5.9.5 Paper Drawer Selection

Hewlett-Packard® PCL mode: Office/400 and DisplayWrite/36 allow the user to direct the print output to one of three paper sources regardless of whether the printer actually has one, two, three, or more trays to pull paper from. On the host, these three theoretical paper sources are called paper drawers. On the printer, the actual paper sources are usually called trays or bins. The TX/CX 4000 acts as the matchmaker between theoretical paper drawers and physical trays available on the printer.

You can access the paper drawer feature of the TX/CX 4000 through Host/PC download commands 13, 14, and 15 or through the front panel of the TX/CX 4000.

To change the physical tray assigned to the theoretical paper drawer (#1, #2, or #3):

1. Select the paper-drawer number through the TX/CX 4000's front panel or through a Host/PC download command.

2. Select the number representing the physical tray listed in the printer's manual.

By changing the paper drawer on the host, you can now access up to three different paper sources on the printer.

Table 5-2 shows the default values and, as an example, lists the corresponding paper tray used for an HP LaserJet 4 Si and HP LaserJet 4 Plus.

Table 5-2. Default Values for Paper Tray.

Host/PC Download Command	Paper Drawer Number	Default Escape Value	HP LaserJet 4Si Paper Tray	HP LaserJet 4Si Plus Paper Tray
Z13	1	ESC&11H	Upper	Cassette
Z14	2	ESC&14H	Lower	MP tray
Z15	3	ESC&15H	Not Used	500-sheet Cassette

To change the assigned paper tray, type the respective command followed by a comma (,) and the corresponding number of the chosen paper source.

If you have an HP LaserJet 4 Plus connected to the TX/CX 4000 and the host is requesting paper to be fed through paper drawer #1, the HP printer would, by default, feed from the Paper Cassette. Assign the 500-sheet Cassette to the paper drawer #1, input 5 (from ESC&l5H) as the value for Paper Drawer # 1 =, or send the Host/PC download command Z13,5 to the printer.

5.10 APO and COR

IBM introduced Automatic Print Orientation (APO) and Computer Output Reduction (COR) with the 3812 printer. These features rotate data-processing reports to a landscape orientation and compress text as needed to fit the complete document on a standard 8-1/2" x 14" page. This allows the user to print a report initially designed to fit on 14-7/8" x 11" green bar paper onto a standard letter- or legal-size page without redesigning the report. APO and COR can also be applied to word-processing documents.

Figure 5-1 shows the decision process used to determine the orientation of reports sent from the host. To properly set up COR or to determine why the results are not as expected, follow the diagram, along with the following explanations:

BLOCK 1: The TX/CX 4000 first checks for a Set Text Orientation (STO) command from the host. In a data processing document, the STO command is usually found in the printer file. In a word-processing document, you can usually specify the rotation by choosing Portrait or Landscape from a format menu. If a rotation is specified, the document prints in the host-selected font using the STO command to control orientation. If a rotation is not specified, the decision process continues to BLOCK 2. If page rotation of a data-processing report is set to *COR (AS/400 only), the decision process continues directly to BLOCK 5.

BLOCK 2: If the TX/CX 4000's APO is enabled (on), the decision process continues to BLOCK 3. With APO disabled (off), the decision process continues to BLOCK 4.

BLOCK 3: The TX/CX 4000 determines whether the page size is 8 1/2" x 14" or smaller. For data-processing reports, the actual page size is calculated using the following formula:

Width = Max. Print Position (MPP/CPI)
Length = Max. Print Lines (MPL/LPI)

In word-processing documents, the actual page size is already specified. If the page size is 8-1/2" x 14" or smaller, the decision process continues to BLOCK 6, as the document is small enough to fit on the page, and COR is not necessary. The APO feature will determine if the document is printed with portrait or landscape orientation. If the page size is larger than 8-1/2" x 14", the decision process continues to BLOCK 5.

BLOCK 4: The TX/CX 4000 then considers its own page-orientation settings. If the TX/CX 4000 is set to landscape, the report will print in landscape. If it is set to portrait, the report will print in portrait. If COR is selected by setting portrait and landscape to OFF on the front panel or by sending host download commands 06 and 07, each with a value of 0 (&%Z06,)0\Z07,0), the document will print in landscape with compressed text. If "COR, host selected" is chosen by setting portrait and landscape to ON from the front panel or by sending host download command 06s and 07 (each with a value of 1), the decision process continues to BLOCK 5.

BLOCK 5: The "COR, host selected" setting of the TX/CX 4000 behaves exactly like the COR setting in the host's printer file. With one or both of these settings active, a true 3812 printer emulation is required to check for certain host commands that could override the COR request. The commands are:

- System/36: an OCL statement of TEXT-YES or Rotate-0
- System/38: a CL statement of PRTQLTY *STD or *NLQ or Rotate-0
- AS/400: a selection of PAGRTT *COR and PRTQLTY *STD or *NLQ

If any of these statements is found, the document will print in portrait orientation with the specified font. If none of these statements is found, the document will print in landscape orientation with compressed text.

BLOCK 6: If the width of the document page is greater than its height, the TX/CX 4000 will automatically rotate the page (APO) to print in landscape. Otherwise, it will print in portrait orientation.

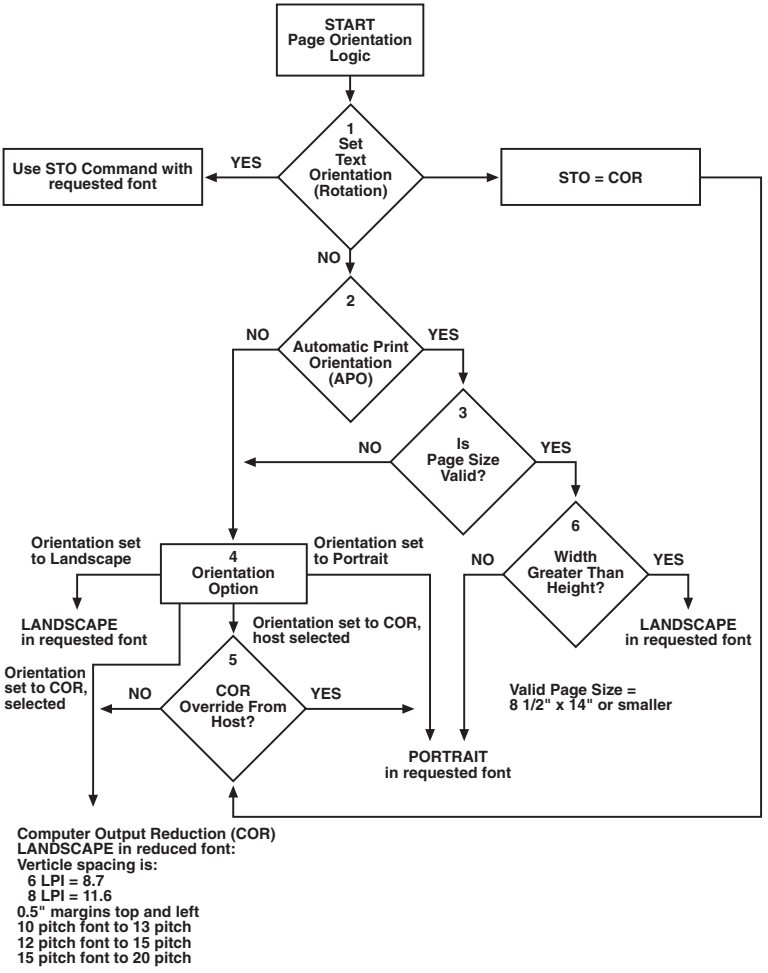

Figure 5-1. Decision Process.

COR is defined as printing in landscape orientation, top and left margins set at 0.5", with CPI and LPI reduced according to **Table 5-3**.

Table 5-3. Reducing LPI.

Host CPI	Reduced to:	Maximum Columns (Characters)/Page
10	13.3	132
12	15	154
15	20	198
Host LPI	**Reduced to:**	**Maximum Rows (Lines)/Page**
6	8.7	66
8	11.6	88

5.10.1 Envelope Printing

To print envelopes, set the TX/CX 4000 to landscape orientation or activate the Auto Print Orientation feature via the front panel. The following example shows how to print envelopes from a word processing program, using the printer's optional envelope feeder.

1. Select line 1 as the first typing line.
2. Specify Envelope size in the program.
3. Select Feed Envelope in the program. Then choose the font desired.
4. Set the left margin to 1.
5. Type the return address, starting at line 1, column 1.
6. Type the mailing address. The appropriate space for the address will vary with the envelope size. For a Commercial 10 envelope, the address starts at about line 10, column 55.
7. Print the envelope.

The following envelope sizes are supported by the TX/CX 4000:

- Monarch—3-7/8" x 7 1/2"
- Commercial 10—4-1/8" x 9-1/2"
- International DL—110 mm x 220 mm
- International D5—162 mm x 229 mm

5.10.2 Document/Envelope Printing

A letter and an envelope can be printed from DisplayWrite/36 or OfficeVision/400 in the same document by following this procedure:

1. Set the format for the letter and enter the letter file. On the first typing line, press CMD20 for Change Format.
2. Select 1 for Document Options, then another 1 for Document Format. Select 3 for Typestyle/Color.
3. Select the font ID Number for the letter, such as No. 11, 86, etc., then press ENTER.
4. From the Document Format screen, select option 4 for Page Layout/Paper Options. Scroll to the second screen of these options and select a paper size of 8.5" (width) x 11" (length) inches and paper source 1. If the letter is more than one page, select paper source of 1 for the following pages. Press ENTER to return to the Document Format screen, then CMD 12 to return to the Document Options screen.
5. Now set up the Alternate Format for the envelope. Select 2 for Alternate Format, then 3 for Typestyle/Color. Select the font ID for the envelope and press ENTER to return to the Alternate Format screen.
6. Select 4, Page Layout/Paper Options. Choose a first typing line of 11, then scroll down to the second screen of the options and choose a paper width of 7.5 (monarch size) or 9.5 (commercial, or #10 size) and a paper length of 4 inches. For a paper source, select 5 for Envelope Feed. Press ENTER to return to the Alternate Format screen.
7. Select option 1 for Margins and Tabs and make the left margin 1. Press ENTER and CMD3 until you are back in the document.
8. Type in the letter. When done, add in a page end by pressing ALT P.

9. Now load in the Alternate Format for the envelope. To do this, press the CMD5 key, and type in **rf** for Resetting Format. Press ENTER. Select option 4 on the Alternate Format screen, Begin Alternate Format. Press ENTER.

10. You will now be back in the document, with the Alternate Format. If these instructions have been followed, the cursor will be on the first typing line of 11, with the left margin of 40. Type in the envelope address, and send the file to print. The letter will print out first, followed by the envelope.

NOTE

The printer may eject a blank page when printing orientation has been changed. If the buffer and ready light remain steady, press the Print/Check button on the printer's operator panel to eject the last page.

5.10.3 Duplex Printing

Some printers can perform both simplex (single-sided) and duplex (double-sided) printing. Duplex printing can be accomplished in three ways:

- In OfficeVision/400, select duplex printing in the host print options menu for that document
- In OS/400 V2 R3, select duplex printing in the printer file ("Print on both sides. . ." *Yes or *Tumble)
- Place the duplexing commands in the document

For most documents, select duplex printing through the host's print options menu (OfficeVision/400) or through the printer file (OS/400 V2 R3).

Duplexing commands are similar to the font change commands. These commands are placed on the first line of the document (if not on the first line, the commands do not take effect until the second page of the document). The commands are:

¬D0 for simplex printing

¬D1 for long edge duplex printing

¬D2 for short edge duplex printing

When the printer receives a duplexing command, it prints in that mode until another printing command is received. Place the simplex command at the end of the document to return the printer to simplex mode. Envelope printing between documents does not change the printer's mode.

With some duplex printing, if the last page is single-sided, it might remain in the printer. The form feed light remains on. When the next print job is sent, this page will be ejected. To manually eject the last page, take the printer off line by pressing the ONLINE button, then press the FORM FEED button to eject the last page. Put the printer back on line by pressing the ONLINE button once more.

5.11 Other Printer Commands

Table 5-4 contains a summary list of special commands that the laser-printer emulation will obey if they are imbedded in a user's document.

Table 5-4. Summary List of Special Commands.

Command	Function
¬E	Sends an ASCII ESC command to the printer
¬TY	Enables true 6 LPI printing
¬TN	Disaables true 6 LPI printing
¬I	Ignores all host formatting commands
¬S	Stop ignoring host formatting commands

The ¬E command allows an "Esc" command to be sent to the printer to control the printing. Simple "escape" commands eliminate the need for putting in complicated hex codes using Command Pass-Thru. These commands allow use of some of the special features of the laser printer.

Check the printer's manual or the technical manual for any option installed in the printer for a description of the feature and the escape commands needed to access the feature. These commands consist of characters that are all found on the IBM twinax keyboard except for the Escape character. For example, ¬E(s3B would begin bold printing.

The printer will slightly compress line spacing to fit 66 lines onto the page. This may be undesirable (such as when using pre-printed forms that must align correctly). In these cases, the ¬TY command prevents the printer from compressing the line spacing.

Use the ¬I and ¬S commands to remove unwanted host commands from a print file. For example, when printing with electronic forms software, these files are recognized by the host as text files, which causes the host to format the files with unwanted carriage returns and line feeds. Placing the ¬I at the end of a line and ¬S at the front of the next line causes the interface to remove the host carriage return and line feed commands and send only the data to the printer.

The TX/CX 4000 printer emulation is compatible with the electronic forms software marketed by Xpoint Corporation, Eclipse Corporation, Formula One Systems, and others.

5.12 Matrix/Specialty Printer Operation

The TX/CX 4000 offers the following output protocols for matrix printers:

- IBM PPDS (Proprinter III, 23XX, 4226)
- IBM Proprinter 4201/4202
- Epson, 9-pin (FX, DFX)
- Epson, 9-pin (DFX+)
- Epson, 24-pin (LQ)
- Epson ESC/P2
- Generic

5.13 ASCII Codes (Character Set)

By default, the interface uses the Code Page 850 character set. You also have the option to select the Code Page 437 or HP Roman 8 character sets. Please be aware that Code Page 437 has 41 fewer characters than Code Page 850. Although the TX/CX 4000 artificially produces these missing characters, at times the "reproduction" may not satisfy your quality requirements.

5.14 Print Quality

The TX/CX 4000's IBM 4214 printer emulation offers Draft Default or Draft NLG (Near Letter Quality) print-quality options. If a default-print-quality command is sent from the host, the TX/CX 4000 allows you to specify whether this default is Draft or NLQ. Set the desired print quality through the front panel (4214 Print Quality) or through Host/PC download command 22.

5.14.1 Pitch Control

The TX/CX 4000's 4214 emulation permits the printer to print 5, 10, 12, 15, and 17.1 CPI (pitch). The pitch can vary, depending on the CPI selected in the host document or the printer's front panel.

The 5224/5225 emulation only allows 10 and 15 CPI printing, and the 5256 emulation only allows 10 CPI printing, unless the CPI is overridden at the printer's front panel.

5.14.2 Graphics Printing

The TX/CX 4000 will print the same Advanced Printer Functions (APF) and Business Graphics Utility (BGU) graphics as the IBM 4214, 5224, and 5225 printers using All Points Available (APA) bit-image graphics using Epson and Proprinter Emulations. It does not function in Generic emulation. This method is used for printing continuous patterns such as bar codes and logos that come from the twinax host.

Graphics are printed on IBM System/34, /36, /38 from the APF and BGU programs and programmer-defined characters using the command Load Alternate Character (LAC). This capability is supported by 5224/5225 printers in spacing of 10 and 15 CPI and 4214 printers in spacing of 10, 12, and 15 CPI.

The TX/CX 4000 implements the LAC command by taking the dot pattern received from the twinax host and then printing that exact dot pattern using the printer's APA bit image graphics at high density 240 dots/inch. This permits the printer to print APF and BGU graphic output using exactly the same spacing as the IBM 4214/5224/5225 printers.

5.14.3 Line Length

This option allows documents formatted for wide paper to print on 8" paper without wrapping to the next line. This is very useful for screen dumps when no valuable data is beyond 8 inches. When Truncate is selected, the TX/CX 4000 will drop all the data beyond 8" on the page. The feature can be activated using the front panel or Host/PC download command 26.

5.14.4 True 15 CPI

True 15-CPI printing is not available for printers without 15-CPI capability. However, the TX/CX 4000 is able to print an artificial 15-CPI pitch when using the Epson 9-pin output protocol. The printer actually prints 17.1 CPI, and the TX/CX 4000 adjusts for the spacing differences. This allows 15-CPI fonts to be sent from the host and still use preprinted forms that must align correctly. However, printing 15 CPI on Epson 9-pin printers and printers using the same output protocol may reduce printing speed. The Epson 5000+ is the currently the only Epson 9-pin printer with the capability to print true 15 CPI.

5.15 Generic Mode

The Generic output protocol should be used when the other output protocols of the TX/CX 4000 are inadequate. This can be the case with printers such as certain barcode-label printers or embossers and also with older printers from Okidata or Mannesmann-Tally. Refer to the printer's user's guide to find out if the printer operates with one of the TX/CX 4000 output protocols.

In Generic mode, the TX/CX 4000 does not pass on the LPI and CPI commands from the host. Rather, it allows you to match the printer specific CPI or LPI command with the CPI or LPI command from the host (through Host/PC download commands 84 through 89).

For example, the printer protocol required is not available on the TX/CX 4000. To change the printer to 10 CPI, the printer's user's manual provides the hexadecimal value of 1B 50. Use the Host/PC download command 88 to assign the value 1B 50 to the 10 CPI string (type &%Z88,1(1B 50)). From now on, when the interface receives a request for 10 CPI from the host, it will send the value 1B 50 to the printer and thereby set it to 10 CPI.

If nothing is assigned to the CPI or LPI string, the TX/CX 4000 will send nothing to the printer: it will ignore the CPI or LPI command from the host.

The TX/CX 4000 stores commands for the following CPI and LPI values:

- 6 LPI—Host/PC download command 84
- 8 LPI—Host/PC download command 85
- 10 CPI—Host/PC download command 86
- 15 CPI—Host/PC download command 87
- 12 CPI—Host/PC download command 88
- 16.7 CPI—Host/PC download command 89

5.16 Command Pass-Thru™

The Command Pass-Thru feature allows access to all of the built-in features of the printer, even if these features aren't normally available through the host software. Command Pass-Thru lets you place printer-specific command sequences into the data sent to the printer. The TX/CX 4000 recognizes these special sequences and "passes the command through" to the printer. The steps below describe how to use Command Pass-Thru.

1. Find the command for the print feature in the printer's user's guide.
2. Convert the printer command to hexadecimal.
3. Place &% , or the alternate CPT start delimiter, in the document at the point where the feature is to take effect. This signals the start of the print feature.

   Enter the beginning printer command, then enter &% or the alternate CPT end delimiter. A space may be entered between hexadecimal code pairs to make the command easier to read, but do not put spaces between the delimiter and the hexadecimal characters.

4. Move the cursor to the point in the text that you want to end the print feature. Enter &% , or the alternate CPT start delimiter, followed by the ending printer command, and then &% or the alternate CPT end delimiter again.

For example:

The command ESC &d0D begins underlining and ESC &d@ ends underlining. First convert the start command to the hexadecimal 1B 26 64 30 44 and the ending command to 1B 26 64 40. If the delimiter is the default &% (hex 50 6C), then enter the commands as follows:

This is an &%1B26643044&%underlined&%1B266440&% word.

to print on the printer as:

This is an underlined word.

Only characters from 00 to FF are recognized (alphabetic characters must be in upper case). Errors in the Command Pass-Thru sequence will cause the TX/CX 4000 to ignore the command, and printing will resume at the point where the error occurred.

Command Pass-Thru may make lines shorter than you expect, since the commands take up space on the screen but do not print.

If part of the command sequence is printed, an error has been made entering the codes. Check the document and make sure the correct format and EBCDIC hexadecimal characters are being used.

Avoid sending codes that would move the print position during Command Pass-Thru. Since the TX/CX 4000 does not process these commands, it cannot keep track of the print-position changes. This may affect the position of characters that follow the command and the page layout.

Some commands (such as emphasized or bold printing) may continue until another string is encountered that returns printing to normal, or for some host systems, until the next page is sent to the printer.

The TX/CX 4000 self-test prints out a list of command numbers and the command strings assigned to them.

If the printer has the capability, the TX/CX 4000 allows you to further specify if Draft printing should be Fast Draft or Normal Draft (Front Panel: Draft Printing; Host/PC download: Command 23). Request for Draft printing can come directly from the host or from the TX/CX 4000 (host sends Default print quality and TX/CX 4000's 4214 Default Print Quality is set to Draft). If the printer only offers one draft printing mode, the setting of the Draft Printing option is ignored.

Another way to modify the print quality is to set the printer to a certain value through its front panel. By activating the Override Format Commands option of the TX/CX 4000 through the TX/CX 4000's front panel or through Host/PC download command 16, the printer's front-panel settings are "locked in" and remain valid until the Override Format Command is disabled.

5.17 User-Defined Command Strings

5.17.1 User-Defined Strings

To avoid keying in frequently used printer commands (which would appear in the document as hex values imbedded in Command Pass-Thru delimiters), you should take advantage of the User-Defined Strings feature.

Using Host/PC download command 55, assign the numbers 0 through 5 to frequently used printer command strings.

After a command string has been defined, activate it by typing the delimiter (&% or the alternate CPT start delimiter) followed by the string number (U0 through U9) into the document or on the screen. When the document or screen is printed, the interface will recognize the &%U and send the command assigned to the string number to the printer.

For example, if you assigned command number U1 to a command string to turn on shadowed printing (hex codes 1B 28 73 31 32 38 53) for a Lexmark 4039 printer, then simply enter &%U1 in the document at the point where shadowed printing is to begin.

5.17.2 User-Defined Fonts (HP PCL only)

The TX/CX 4000 supports a vast variety of fonts. In addition, the User-Defined Fonts feature allows assignment of new or existing font IDs to different printer-resident fonts or fonts from an optional font cartridge. Up to 10 new pairs of font IDs and fonts can be created.

For example, if an HP LaserJet 4Si is being used, the font ID 11by default represents Courier 10 cpi. You can assign the font ID 11 to a different font (e.g. Courier bold 10 cpi), by sending the Host/PC download command &%Z21,0,11(<(12U<(s0p10h12v0s3b 4099T) to the printer. Font ID 11 has now been redefined as Courier bold 10 cpi. Consult the printer's user's guide for the information needed to write the string.

In the same manner, personalized font IDs can be assigned to printer-resident fonts or to fonts from an optional font cartridge. These fonts can then be called up by using the newly assigned font ID, the same way the standard printer-resident fonts are called up.

6. Configuration—Coax

The TX/CX 4000 can be configured through the front panel or by sending download commands from the host or from a PC/LAN. Refer to **Section 3.1, Using the Front Panel**, for more detailed information. **Figures 6-1, 6-2,** and **6-3** show how the front panel is arranged and the option menus.

Test Menu	Self Test Active	
Self Test Printout	Cycle power to end	
Twinax Diagnostics		
Hard Loopback Test		
Basic Setup Menu	[02] Lines Per Inch	
	3	*6=Default LPI
	4	8
	[03] Characters Per Inch	
	*10=Default CPI	15
	12	16
	[04] Line Spacing	
	*0=Single (6/8 LPI)	
	1=Double (3/4 LPI)	
	[07] Print Case	
	0=Mono	*1=Dual
	[30] Override Format	
	*0=Disable	1=Enable
	[42] Buffer Hex Dump	
	1=Yes	*2=No

NOTE: * indicates factory defaults.

Figure 6-1. Test Menu and Basic Setup Menu.

[60] Output Printer

0=IBM PPDS Matrix	5=IBM Proprinter
1=Epson ESC/P2	6=Epson LQ (24-pin)
2=HP LaserJet PCL-4	7=Epson DFX plus
3=IBM PPDSLaser	8=Epson FX/DFX(old)
4=IBM HP Laser	*9=Generic Matrix

[66] Output Port

*0=Parallel	1=Serial

[76] Input Baud (and [72] Output Baud)

0=38.4K	4=2400
1=19.2K	5=1200
*2=9600	6=600
3=4800	7=300

[77] Input Word (and [73] Output Word)

7=7 bits	*8=8 bits

[78] Input Stop (and [74] Output Stop)

*1=1 bit	2=2 bits

[79] Input Parity (and [75] Output Parity)

*0=None	2=Even
1=Odd	

[05] Form Length

*66 Lines	+ or -

[06] Maximum Print Position

*132 Characters	+ or -

[34] Interval Timeout

*120 x 5 seconds	+ or -

[50] P/S Timeout

4 to 60 seconds	*8 seconds

[51] Coax Timeout

4 to 60 seconds	*10 seconds

NOTE: * indicates factory defaults.

Figure 6-2. Basic Setup Menu.

Advanced Setup Menu

[01] Buffer Size
- 1=196 characters
- *2=1920 characters
- 3=2560 characters
- 4=3440 characters
- 5=3564 characters

[08] LU1 Language
- 00=Multinational
- *01=U.S/Canada
- 02=Austria/German
- 03=Belgian
- 04=Brazil
- 05=Canada (French)
- 06=Denmark/Norway
- 07=Finland/Sweden
- 08=France
- 09=Italy
- 10=Japan (English)
- 11=Katakana (US)
- 12=Portugal
- 13=Spain
- 14=Spanish Speaking
- 15=United Kingdom

[11] Paper Path
- 0=Ignore Host
- *1=Tray 1/Tractor
- 2=Tray 2/Primary
- 3=Envelope
- 4=Manual sheet
- 5=Manual envelope
- 7=Epson DFX Front
- 8=Epson DFX Rear

[25] Form Feed Usage
- *0=Obey All
- 1=FF by LFs
- 2=Ignore FFs

[26] Empty Forms
- *0=No Suppression
- 1=Suppress Empty

[27] FF After Time
- *0=No
- 1=Yes

[31] Truncate/Wrap
- *0=Wrap
- 1=Truncate

[36] Suppress IBM Code
- *0=No
- 1=All
- 2=CPI & LPI
- 3=CPI
- 4=LPI
- 5=Print Quality

[37] Vertical Channel
- 0=3287 VCS
- *1=3268/4214/4224

[45] SCS Translate
- 0=Binary Transfer
- *1=Emulate 3287

[65] Character Set
- *Code Page 850
- Roman 8
- PC Set 2

NOTE: * indicates default settings.

Figure 6-3. Advanced Setup Menu.

	[09] EPSON Matrix Font	
	*2=Roman	7=OCR-8
	3=Sans Serif	8=OCR-A
	4=Courier	9=OCR-B
	5=Prestige	A=OCR-B
	6=Script	B=OCR-B
	[21] Matrix Quality	
	*0=PPM Commands	
	1=Fast Draft	3=PPM Reversed
	2=Normal Draft	4=NLQ
LU3 RPQ Setup Menu	[12] FF Before Dump	
	*0=No FF	1=Form Feed
	[13] FF After Dump	
	*0=No FF	1=Form Feed
	[14] Null Line Suppress	
	0=NLS Loc & N-SCS	2=NLS Loc TSI NSCS
	1=N-SCS TSI Loc	*3=TSI Loc & N-SCS
	[15] CR at MMP+1	
	*0=Next Line	1=Current Line
	[16] NL at MMP +1	
	*0=+2 Lines	1=Current Line
	[17] Text After FF	
	*0=PP-1 +2 lines	1=PP-1 + 1 line
	[18] FF at EOB	
	*0=PP-1 on Line 2	1=PP-1 on line 1
	[19] FF Valid Position	
	*0=PP-1 or MMP +1	1=Anywhere
	[20] Action at EOJ	
	*0=Auto New Line	1=Auto Form Feed
Set Factory Defaults	Select=Restoring Factory Defaults	
	Are you sure? Press SELECT to continue	
	Restoring Factory	
	Menu=Press MENU to enter or SELECT to exit	
	Menu-Recycles to Test Menu	
	Select-Returns to on-line condition	

NOTE: * indicates default values.

Figure 6-4. Advanced Setup Menu (continued), LU3 RPQ Setup Menu, and Set Factory Defaults.

Coax Host/PC Download Commands

By sending download commands from the Host/PC to the TX/CX 4000, you can change all available configuration parameters.

NOTE

This section includes all configuration parameters accessible through the front panel, as well as additional parameters.

Host/PC download commands are placed in a host/PC document or on the screen. The commands take effect when the print job or screen print is sent to the TX/CX 4000. The TX/CX 4000 checks data streams on all three input ports (host, serial, parallel) for download commands. So, no matter whether the incoming print job is a screen print, a spreadsheet, or a word-processing document created on either host or PC, the interface will recognize the Host/PC download command. The command itself will not be printed if it was entered correctly and is accepted by the TX/CX 4000.

If any part of the command is printed, the TX/CX 4000 did not recognize the command because of a problem in the format. Check the syntax of the command and send the command again.

You can send invalid Host/PC download commands to the printer. For example, if you selected an output printer different from HP LaserJet PCL-4 (Command 60) and then send a request for landscape orientation (Command 33), the orientation command would be invalid, since it only functions with the HP LaserJet PCL-4 output printer.

Host/PC download commands sent to the TX/CX 4000 take effect immediately (unless noted otherwise) and stay only in the TX/CX 4000's active memory. To save the changed configuration beyond a power-off, Host/PC download command Z99,1 must be sent.

NOTE

Save the Host/PC download commands in a separate file. If the TX/CX 4000 has to be reconfigured at a later time or if you need to configure more than one TX/CX 4000, all you need to do is "print" the file containing your Host/PC download commands.

Take the following steps to enter a host download command.

1. Type the Command Pass-Thru delimiter &% (or alternate CPT start delimiter as described in the table under "Alternate Command ID Characters") in the document at the point where the command to take effect.

2. Type an upper-case "Z."

3. Type the command number for the command to be used, as shown in the table.

4. Type a comma.

5. Type the command. No spaces are allowed. A space or invalid character in a command causes the TX/CX 4000 to ignore the command and resume printing from the point where the error occurred.

6. Multiple commands can be chained together by using a slash (/) or backslash (\) to separate the commands (no spaces allowed). For example, to set the Output Printer (Command 60) to HP LaserJet PCL-4 (Option 2), the Output Port (Command 66) to Parallel (Option 0), and the orientation for the Alternate Paper Tray (Command 63) to Landscape (Option 2), type:

&%Z60,2\66,0\63,2

The following table shows the Coax Host/PC Download command and its command number in alphabetical order. This table includes all configuration parameters accessible through the front panel, as well as additional parameters.

Table 6-1. Coax Host/PC Download Commands.

Host/PC Download Command	Command Number
10 CPI String	86
12 CPI String	88
15 CPI String	87
16.7 CPI String	89
6 LPI String	84
8 LPI String	85
Action at End of Job	20
Alternate Command ID Characters	41
Alternate Paper Tray	63
Automatic Print Orientation	61
Buffer Hex Dump	42
Buffer Size	01
Characters Per Inch	03
Character Set	65
Coax Timeout	51

Table 6-1. Coax Host/PC Download Commands (continued).

Host/PC Download Command	Command Number
CPT Beginning Delimiter Characters	40
CPT Ending Delimiter Characters	39
CR at MPP +1	15
Custom User Strings	55
Empty Forms	26
EPSON Matrix Font	09
FF After Dump	13
FF After Timeout	27
FF At End of Print	18
FF Before Dump	12
FF Valid Position	19
Form Feed Usage	25
Form Length	05
Host Port Initialization String	57
Input Baud	76

Table 6-1. Coax Host/PC Download Commands (continued).

Host/PC Download Command	Command Number
Input Parity	79
Input Stop	78
Input Word	77
Interval Timeout	34
Laser Paper Size	32
Line Spacing	04
Lines Per Inch	02
LU1 Language	08
Manual Feed Tray Organization	64
Matrix Quality	21
Maximum Print Position	06
NL at MPP +1	16
Null Line Suppress	14
Output Port	66
Output Printer	60

Table 6-1. Coax Host/PC Download Commands (continued).

Host/PC Download Command	Command Number
Override Format	30
Overwrite DSC (LU3) Translation Table	71
Overwrite EBCDIC (SCS/LU1) Translation Table	70
PA Response	35
Paper Path	11
Parallel Port Initialization String	56
Primary Paper Tray Orientation	62
Print Case	07
P/S Timeout	50
Restore Factory Defaults	98
SCS Translate	45
Serial Port Initialization String	58
Serial Out Baud Rate	72
Serial Out Parity	75
Serial Out Stop Bits	74

Table 6-1. Coax Host/PC Download Commands (continued).

Host/PC Download Command	Command Number
Serial Out Word	73
Store Configuration in Permanent Memory	99
Suppress IBM Code	36
Text After FF	17
True LPI	38
Truncate/Wrap Select	31
Vertical Channel	37

Asterisks identify factory-default settings. Invalid commands (such as selecting 2 LPI) are ignored and the last valid setting will be unchanged. Examples in this section apply to configuration through Coax Host/PC download only.

COMMAND 01: BUFFER SIZE

Selects logical default buffer size.

VALUE	DESCRIPTION
1	960 characters
*2	1920 characters
3	2560 characters
4	3440 characters
5	3564 characters

COMMAND 02: LINES PER INCH

Selects default LPI.

VALUE	DESCRIPTION
3	3 LPI
4	4 LPI
*6	6 LPI
8	8 LPI

NOTE

This default emulates the front-panel selection on an IBM printer.

Example: &%Z2,8 Sets the printer to 8 LPI default

COMMAND 03: CHARACTERS PER INCH

Selects default CPI

VALUE	DESCRIPTION
*10	10 CPI
12	12 CPI
15	15 CPI
16	16.7 CPI

Example: &%Z3,15 Sets the printer to 15 CPI default

COMMAND 04: LINE SPACING

Selects default Line Spacing

VALUE	DESCRIPTION
*0	6/8 LPI (single space)
1	3/4 LPI (double space)

Example: &%Z4,1 Sets the printer to double space default

COMMAND 05: FORM LENGTH

Selects default Form Length (MPL = Maximum Print Lines).

VALUE	DESCRIPTION
000	No form length control
001 to 255	Set form length in number of lines
*66	Factory Default

NOTE

The 000 value enables the front-panel selection on the printer to control the form length when Command 25 is set to value 0.

Example: &%Z5,70 Sets form length to 70 lines for A4 paper

COMMAND 06: MAXIMUM PRINT POSITION

Selects current and default Maximum Print Position, the maximum number of characters which can be printed on each line.

VALUE	DESCRIPTION
000	Infinite line length
001 to 255	Set MPP in number of characters
*132	Factory Default

NOTES

Normal values are 80, 132, or 198 characters. This default emulates the front-panel selection on an HP printer.

MPP and the current position will not be changed by changes in CPI.

The infinite line length will place no limits on the number of characters that can be sent to the printer on a single line.

Example: &%Z6,80 Sets MPP to 80 characters

COMMAND 07: PRINT CASE

Selects default print case.

VALUE	DESCRIPTION
0	Mono case
*1	Dual case

NOTE

This default affects only LU3 printing.

Example: &%Z7,0Sets default to mono case

COMMAND 08: LU1 LANGUAGE

Selects default LU1 language.

VALUE	DESCRIPTION
00	Multinational
* 01	U.S./Canada
02	Austrian/German
03	Belgian
04	Brazil
05	Canada (French)
06	Denmark/Norway
07	Finland/Sweden
08	France
09	Italy
10	Japan (English
11	Katakana (US)
12	Portugal
13	Spain
14	Spanish Speaking
15	United Kingdom

NOTES

This command, along with command Z99,0, changes the default LU1 language selection in the permanent memory of the interface.

The command value should match the language number used in IBM CU configuration sequence number 121.

Example: &%Z8,04 Sets LU1 language to Brazil.

COMMAND 09: EPSON MATRIX FONT

Selects Epson default font, if supported by the printer.

VALUE	DESCRIPTION
*2	Roman
3	Sans Serif
4	Courier
5	Prestige
6	Script
7	OCR-B
8	OCR-A
9	OCR-B
A	OCR-B
B	OCR-B

COMMAND 11: PAPER PATH

Selects default paper path for the Page Presentation Media (PPM) command.

VALUE	DESCRIPTION
0	Ignore the host
*1	Tray 1/Tractor feed
2	Tray 2/Primary
3	Envelope
4	Manual sheet
5	Manual envelope
6	Epson DFX Front
8	Epson DFX Rear

NOTES

This command defines the default paper source for the Page Presentation Media (PPM) command in SCS mode. If the PPM command is received from the host, the interface always sends the paper source to the printer unless value 0 or 1 is selected.

The printer ignores the command if it does not have a secondary paper bin or an envelope feeder.

A manual sheet feed command in the SCS PPM causes the printer to wait for the operator to insert paper in the manual feed tray. This command takes effect immediately if placed on the first position of the page (line 1, position 1); otherwise, it takes effect on the next page.

Example: &%Z11,4 Selects manual sheet feed as the default source of paper

COMMAND 12: FF BEFORE DUMP

Specifies whether a form feed is performed before doing local screen dump.

VALUE	DESCRIPTION
*0	No form feed before local screen dump
1	Form feed before local screen dump

NOTE

This command affects only the local screen copy function, not the host-initiated local copy printing, and functions only in LU3 (non-SCS) operations.

Example: &%Z12,1 Performs a FF before local screen dump

COMMAND 13: FF AFTER DUMP

Specifies whether a form feed is performed after a local screen dump.

VALUE	DESCRIPTION
*0	No form feed after local screen dump
1	Form feed performed after local screen dump

NOTES

To use this function, the RPQ should be:
IBM 3268 RPQ SC9508
IBM 3287 RPQ MC3750
IBM 4214 OPT 20=3

This command only affects the local screen copy, not the host-initiated local copy printing, and functions only in LU3 (non-SCS) operations.

Example: &%Z13,1 Performs a FF after local screen dump

COMMAND 14: NULL LINE SUPPRESS

Selects Null Line Suppression or True Screen Image in LU3 printing mode.

VALUE	DESCRIPTION
*0	Null line suppression in local copy and non-SCS print
1	Null line suppression in non-SCS print and true screen image in local copy
2	True screen image in non-SCS print and null line suppression in local copy
3	True screen image in non-SCS print and true screen image in local copy

NOTES

To use this function, the RPQ should be:
IBM 3268 RPQ SC9505
IBM 3287 RPQ SC3741
IBM 4214 OPT 18=2

Available only in LU3 (non-SCS) operations.

Values 0 and 1 are only functional from CUT terminals.

Example: &%Z14,3 Prints true screen image in non-SCS print and local copy

COMMAND 15: CR at MPP + 1

Sets the printer in accordance with the RPQ installed in the control unit.

VALUE	DESCRIPTION
*0	First print position (PP) of next line
1	First PP of current line

NOTES

To use this function, the RPQ should be:
IBM 3268 RPQ SC9501
IBM 3287 RPQ S30219
IBM 4214 OPT 15=1

Available only in LU3 (non-SCS) operation.

Example: &%Z15,1 Prints first PP of current line as the next PP when a CR is received at MPP+1.

COMMAND 16: NL at MPP + 1

Sets the printer in accordance with the RPQ installed in the control unit.

VALUE	DESCRIPTION
*0	First PP of current line + 2 lines
1	First PP of next line

NOTES

To use this function, the RPQ should be:
IBM 3268 RPQ SC9502
IBM 3287 RPQ S30219
IBM 4214 OPT 15=1

Available only in LU3 (non-SCS) operation.

Example: &%Z16,1 Performs first PP of next line as the next PP when an NL is received at MPP+1.

COMMAND 17: TEXT AFTER FF

Sets the printer in accordance with the RPQ installed in the control unit.

VALUE	DESCRIPTION
*0	Second print position of first line on next form
1	First print position (PP) of first line on next form

NOTES

For the Value 1 selection, the RPQ would be:
IBM 3268 RPQ SC9503
IBM 3287 RPQ N/A
IBM 4214 OPT 16=2

Available only in LU3 (non-SCS) operation.

Example: &%Z17,1 Performs first PP of first line on next form as the next PP when a valid FF is not positioned at the end of an IBM print buffer.

COMMAND 18: FF AT END OF PRINT

Sets the printer in accordance with the RPQ installed in the control unit.

VALUE	DESCRIPTION
0	First PP of second line on next form
*1	First PP of first line on next form

NOTES

To use this function, the RPQ should be:
IBM 3268 RPQ SC9504
IBM 3287 RPQ SC3749
IBM 4214 OPT 17=2

Available only in LU3 (non-SCS) operation.

Example: &%Z18,1 Performs first PP of first line on next form as the next PP when a valid FF is received at the end of an IBM print buffer.

COMMAND 19: FF VALID POSITION

Sets the printer in accordance with the RPQ installed in the control unit

VALUE	DESCRIPTION
*0	FF is valid only at the first print position or at position MPP+1.
1	FF is valid anywhere it occurs.

NOTES

To use this function, the RPQ should be:
IBM 3268 RPQ SC9506
IBM 3287 RPQ SC3739
IBM 4214 OPT 19=1

Available only in LU3 (non-SCS) operation.

Example: &%Z19,1 Makes FF valid anywhere it occurs

COMMAND 20: ACTION AT END OF JOB

Sets the printer in accordance with the RPQ installed in the control unit.

VALUE	DESCRIPTION
*0	Auto new line
1	Auto form feed

NOTES

To use this function, the RPQ should be:
IBM 3268 RPQ SC9507
IBM 3287 RPQ SC3740
IBM 4214 OPT 20=2

Available only in LU3 (non-SCS) operation.

Do not press the form feed or line feed button on the front of the printer. This will cause the host and printer to lose synchronization of paper position. This command reduces the need to advance the paper.

Example: &%Z20,1 Sets the printer to issue a FF automatically at the end of the print buffer.

COMMAND 21: MATRIX QUALITY

Defines matrix print quality.

VALUE	DESCRIPTION
*0	PPM commands
1	Fast Draft
2	Normal Draft
3	PPM Reversed
4	NLQ

COMMAND 25: FORM FEED USAGE

Enables a Forms Feed from the host system to be converted to the required number of line feeds (beneficial when forms length is controlled by the TX/CX 4000).

VALUE	DESCRIPTION
*0	Obey all
1	Form feeds by line feed
2	Ignore form feeds

Example: &%Z25,1 Sets the printer to count the lines specified in Command 5.

COMMAND 26: EMPTY FORMS

Suppresses blank printout pages caused by form feed commands that occur at the top of a form.

VALUE	DESCRIPTION
*0	No, do not suppress empty forms
1	Yes, suppress empty forms

NOTES

If empty forms are suppressed, the TX/CX 4000 ignores form-feed commands located at the top-of-form position.

This command affects printing in both DSC and SCS modes. This differs from the IBM 3287, which suppresses form feed only in DSC mode.

Example: &%Z26,1 Sets the interface to suppress empty forms

COMMAND 27: FF AFTER TIMEOUT

Sends a form feed if unprinted data remains in the print buffer for the specified coax timeout interval in Command 51.

VALUE	DESCRIPTION
*0	No extra FF is sent
1	Yes, send FF after timeout value

NOTE

In most cases, the host application generates a termination FF and there is no need to change this command from the default.

Example: &%Z27,1 Sends a FF after time delay selected by command 51 (default = 10 seconds) when unprinted data remains in the print buffer.

COMMAND 30: OVERRIDE FORMAT

Enables the printer's front-panel selections to control how a job is printed.

VALUE	DESCRIPTION
*0	Disable
1	Enable

NOTES

When active, this command overrides the interface's default selections for CPI, LPI, font, orientation, bin selection, paper size, COR and line compression.

A reset command is sent to the printer before a coax print job in order to restore the printer's front-panel default selections.

This command has no effect on the special features Command Pass-Thru, user strings, initialization strings, and coax host RPQs.

Example: &%Z30,1 Sets override of formatting commands

COMMAND 31: TRUNCATE/WRAP SELECT

Selects whether the interface truncates or wraps the text if the maximum print position is exceeded.

VALUE	DESCRIPTION
*0	Wrap
1	Truncate text beyond the maximum print position

Example: &%Z31,1 Causes text that exceeds the maximum print position to be truncated (not printed).

COMMAND 32: LASER PAPER SIZE

Specifies the paper size used for printing.

VALUE	DESCRIPTION
*0	Selects 8 1/2" x 11" letter paper
1	Selects A4 (210mm x 297mm, 8.27" X 11.69") paper
2	Selects 8 1/2" x 14" legal paper
3	Printer selected

Example: &%Z32,1 Selects A4 paper

COMMAND 34: INTERVAL TIMEOUT

Sets the time interval before an intervention-required signal is sent to the host after a printer error occurs.

VALUE	DESCRIPTION
000	Never send an IR
001 to 255	Send IR VALUE-times-5 seconds after printer error occurs
*120 x 5	Default, send IR after five minutes.

Example: &%Z34,036 Sets IR time interval to 3 minutes.

COMMAND 35: PA RESPONSE

There are no front panel buttons for this command, since the PA Response is automatically sensed. However, the TX/CX 4000 will accept manual inputs from the host.

COMMAND 36: SUPPRESS IBM CODE

This function is used to select suppression of all or some IBM control codes sent from the host system.

VALUE	DESCRIPTION
*0	No, obey all IBM control codes
1	Suppress all IBM control codes
2	Suppress CPI and LPI control codes
3	Suppress CPI control code
4	Suppress LPI control code
5	Suppress print quality specified in the PPM command

NOTES

If this command is set to 1, documents need to be formatted by sending transparent control codes to the printer using Command Pass-Thru or SCS mode transparent data.

If value 2 is selected, the SCS pitch (CPI), line density (LPI), SHF (MPP), and SVF (MPL) commands will be suppressed (not sent to the printer).

Example: &%Z36,2 No CPI or LPI commands are sent to the printer.

COMMAND 37: VERTICAL CHANNEL

Specifies vertical channel select (VCS) emulation. Functions similarly to a vertical tab, except the 3287 does LF only.

VALUE	DESCRIPTION
0	3287 VCS emulation
*1	3268/4214/4224 VCS emulation

Example: &%Z37,0 Selects 3287 VCS emulation

COMMAND 38: TRUE LPI

Because laser printers have a non-printable border around the edge of a page, 6 LPI and 8 LPI spacing is compressed slightly to enable 66 lines and 88 lines to be printed on 11-inch long paper. This can occasionally cause a problem, especially when using preprinted forms that must align precisely. Command 38 enables a user to override the laser printer LPI compression.

VALUE	DESCRIPTION
*0	Compress the vertical LPI spacing
1	Print using true 6 and 8 LPI spacing

NOTE

If true LPI is selected, the user needs to adjust the document formats to allow for the reduced number of lines that can be printed per page, or the extra lines may print onto another sheet of paper.

Example:	&%Z38,1	Specifies that vertical spacing prints using true 6 and 8 LPI

COMMAND 39: CPT ENDING DELIMITER CHARACTERS

Specifies the two characters to be used for the ending delimiter characters for Command Pass-Thru.

VALUE	DESCRIPTION
XXYY	XX is the ASCII hexadecimal value of the first character and YY is the ASCII hexadecimal value of the second character.

NOTES

If an ending delimiter is not selected with this command, the delimiter selected with Command 40 will be used as a default.

The default delimiter will no longer be active if the command is used to change it. If Command 39 and Command 40 are both entered, Command 39 must be sent after Command 40 to be active.

One delimiter character can be specified instead of two by entering the hex code for the character followed by two zeros (e.g., &%Z39,2500 selects & as the delimiter).

A hex code that starts with 00 is invalid.

Example: &%Z39,253F Specifies the %? characters as the alternate ending delimiter characters (the ASCII hex value for % is 25; the value for ? is 3F).

COMMAND 40: CPT BEGINNING DELIMITER CHARACTERS

Specifies the two characters to be used for the beginning delimiter characters for Command Pass-Thru.

VALUE	DESCRIPTION
XXYY	XX is the ASCII hexadecimal value of the first character, and YY is the ASCII hexadecimal value of the second character

NOTES

Host download commands use the CPT beginning delimiter characters as well. The new character(s) replace the &% in front of the Z.

If you do not select an ending delimiter with Command 39, the delimiter selected with this command will be used as the default ending delimiter.

The default beginning delimiter will no longer be active if you use this command to change it.

One delimiter character can be specified instead of two by entering the hex code for the character followed by two zeros (e.g., &%Z40,2500 selects & as the delimiter).

A hex code that starts with 00 is invalid.

Example: &%Z40,253F Specifies the %? characters as the beginning delimiter characters (the ASCII hex value for % is 25; the value for ? is 3F).

COMMAND 41: ALTERNATE COMMAND ID CHARACTERS

Specifies a character (in addition to Z) that can be used for the command identifier that follows the delimiter characters.

VALUE	DESCRIPTION
00	Deletes the previously selected alternate character
ZZ	ZZ is the ASCII HEX value of the command ID character

NOTE

The character selected must not be a hex value (0 through 9 or A through F), L, P, or U.

Example: &%Z41,59 Specifies "Y" as the alternate command ID character

COMMAND 42: BUFFER HEX DUMP

After receiving a start command, the TX/CX 4000, starting with the next buffer received, sends all host data directly to the printer as hexadecimal printing until a stop command is received or the printer is powered off.

VALUE	DESCRIPTION
1	Yes, start buffer hex dump
*2	No, stop buffer hex dump

NOTES

This command enables the user to print only the section of the document that is in question in buffer hex dump format.

Hex printing starts with the cable buffer after the start command and stops with the cable buffer after the stop command.

Examples: &%Z42,1 Starts buffer hex dump printing
&%Z42,2 Stops buffer hex dump printing

COMMAND 45: SCS TRANSLATE

Specifies how transparent data sent using SCS code 35 is handled.

VALUE	DESCRIPTION
0	Binary Transfer
*1	Emulate 3287

NOTES

Value 1 causes valid graphic characters to be printed normally (i.e., converted from EBCDIC to ASCII), while control codes and invalid graphics are printed as hyphens, and normal page formatting is maintained.

Value 0 causes the 8-bit binary codes to be sent directly to the printer just as they are received from the host.

SCS code 36 functions the same as code 35.

Available in SCS (LU1) mode only.

Example: &%Z45,0 All SCS Code 35 data is sent to the printer as binary codes without translation.

COMMAND 50: P/S TIMEOUT

Selects the time interval that the TX/CX 4000 waits for additional data from the alternate (PC) host before automatically switching to check for data from the coax host.

VALUE	DESCRIPTION
04 to 60	Time interval in number of seconds
*8	Factory default is 8 seconds

NOTES

The TX/CX 4000 sends a reset command to the printer and restores the coax host defined format commands (LPI, CPI, MPL, MPP) prior to printing data from the coax host.

Because the printer is being shared between the parallel port and 3270 host, make sure the PC jobs are not automatically terminated because the printer is busy.

If the printer supports intelligent emulation switching (IES), make sure the printer's timeout period is set to less than the Command 50 timeout setting.

Example: &%Z50,10 Sets the time interval to 10 seconds.

COMMAND 51: COAX TIMEOUT

Selects the time interval that the TX/CX 4000 waits for receipt of additional data from the host before allowing the printer to check for data from the serial or parallel ports.

VALUE	DESCRIPTION
04 to 60	Time interval in number of seconds

*10 Factory default is 10 seconds

Example: &%Z51,05 Sets the timeout interval to 5 seconds

COMMAND 55: CUSTOM USER STRINGS

Allows the user to define up to six custom user strings, of up to 25 bytes each, which are stored in the memory of the TX/CX 4000 and sent to the printer whenever the character delimiter, letter U, and number of the string appears in the text of the document (for example, &%U3).

VALUE	DESCRIPTION
0	
1	Following the value number,
2	type a parenthesis, followed by the ASCII hex bytes
3	included in the user string, and then a parenthesis to end
4	
5	

NOTES

To aid in readability, a single space is allowed between hex bytes, but is not included in the string.

The strings could specify a special font-selection command or other custom command to be sent directly to the printer.

This command, if placed as the first printable data at the top of the page (position 1, line 1), will be sent to the printer prior to the data.

To change a custom user string, simply input the new custom user string values; the old string is automatically erased.

Example:	&%Z55,3(1B01)	Defines the &%U3 custom user string to send an "Escape and SOH" (1B and 01 hex), which is the double-width command to the printer).

COMMAND 56: PARALLEL PORT INITIALIZATION STRING

Allows the user to define a parallel port initialization string of up to 25 bytes, which is stored in the memory of the TX/CX 4000. The string is sent to initialize the printer for parallel port printing after host printing has occurred. The string is sent only if activated through command 66.
To aid in readability, a single space is allowed between hex bytes.

VALUE	DESCRIPTION
1(up to 25 hex bytes)	Defines the initialization string
1()	Deletes initialization string

Example: &%Z56,1() deletes the hex strings previously defined as parallel-port initialization string.

NOTES

To aid in readability, a single space is allowed between hex bytes but is not included in the string.

The coax port initialization string is sent to the printer only when you turn the printer on and after printing by the shared parallel port has occurred.

Host SCS commands and download commands have priority over the initialization-string instructions.

To change the initialization string, simply input the new command values. The old string is automatically erased.

To delete the initialization string from the permanent memory, simply type the parentheses with nothing between them.

COMMAND 57: HOST PORT INITIALIZATION STRING

Allows the user to define an initialization string of up to 25 bytes, which is stored in the memory of the TX/CX 4000 and is sent to initialize the printer for host printing after shared port printing has occurred. The TX/CX 4000 also restores the host page-format parameters after sending this string and prior to host printing.

VALUE	DESCRIPTION
1	Following the value number, insert a parenthesis, followed by the hex bytes included in the command string, and then a parenthesis to end.

NOTES

To aid in readability, a single space is allowed between hex bytes but is not included in the string.

The coax port initialization string is sent to the printer only when you turn the printer on and after printing by the shared parallel port has occurred.

Host SCS commands and download commands have priority over the initialization-string instructions.

To change the initialization string, simply input the new command values. The old string is automatically erased.

To delete the initialization string from the permanent memory, simply type the parentheses with nothing between them.

Example:	&%Z57,1( )	Deletes from permanent memory any hex string that had been previously defined for the coax port initialization string

COMMAND 58: SERIAL PORT INITIALIZATION STRING

Allows the user to define a serial port initialization string of up to 25 bytes. See command 56.

VALUE	DESCRIPTION
1(up to 25 hex bytes)	Defines the initialization string
1()	Deletes the initialization string

Example: &%Z58,1() Deletes the initialization string

COMMAND 60: OUTPUT PRINTER

Specifies the type of output printer the interface will be using when converting host commands.

VALUE	DESCRIPTION
0	IBM PPDS Matrix
1	Epson ESC/P2
2	HP LaserJet PCL-4
3	IBM PPDS Laser
4	IBM HP Laser
5	IBM Proprinter
6	Epson LQ (24 pin)
7	Epson DFX +
8	Epson FX/DFX (old)
*9	Generic Matrix (CPI and LPI)

NOTES

A new setting will not be effective immediately. To activate the new setting save it permanently using the "&%Z99,0" command and then cycle power on the interface.

Values 1 (Epson ESC/P2), 6 (Epson LQ 24-pin), and 9 (Generic Matrix) require the user to manually select the appropriate character set (command 65).

When the HP LaserJet PCL-4 protocol is selected, the default for command 25 (Form Feed Usage) changes to the form feed option.

Example: &%Z60,1 selects the Epson ESC/P2 protocol.

COMMAND 61: AUTOMATIC PRINT ORIENTATION (APO)

Laser printers have the ability to automatically control page orientation if the user decides to activate Auto Print Orientation (APO). Refer to the page orientation logic chart in the Computer Output Reduction section of this manual.

VALUE	DESCRIPTION
*0	APO is ACTIVE. The page dimensions of a document are checked to determine if the data should be printed in landscape because the width is greater than the length.
1	APO is NOT ACTIVE. Print orientation is controlled by the orientation selections specified in Commands 62, 63, and 64.

NOTE

APO active is the recommended selection. A user can manipulate the page dimensions using SCS commands to control the orientation of the printing as long as the page size required is 8 1/2 x 11" or smaller.

Example: &%Z61,1 Disables APO

COMMAND 62: PRIMARY PAPER TRAY ORIENTATION

The SCS (LU1) PPM command specifying the paper tray can also have a printing orientation assigned to that paper tray. Refer to the page orientation logic chart in the Computer Output Reduction section of the manual. This command duplicates the IBM 3812 and 4028 printers' feature with the additional selection of option 3 below.

VALUE	DESCRIPTION
*0	Computer Output Reduction (COR) Mode is active when paper is specified to be selected from the primary tray.
1	Prints PORTRAIT orientation using the active font when the primary tray is specified.
2	Prints LANDSCAPE orientation using the active font when the primary tray is specified.
3	User Defined mode. Documents are printed using the fonts and orientation that the user specifies through use of the &% font ID commands.

Example: &%Z62,3 Specifies that the document is printed as formatted when the primary paper tray is specified as the paper source.

COMMAND 63: ALTERNATE PAPER TRAY ORIENTATION

This command works the same way as Command 62 except it controls the orientation for printing that specifies the alternate tray for the paper source.

Even if the printer does not have an alternate paper tray, the SCS (LU1) host specifies the alternate tray, and the interface prints the document in accordance with the selection in Command 63.

Values are the same as Command 62, but substitute "alternate tray" for "primary tray" in the descriptions.

NOTE

The value 3 is an excellent choice when COR is not required, since the user can choose the fonts and orientation with &% font ID commands.

Example:	&%Z63,2	Specifies that landscape orientation will be used for all printing in which the SCS (LU1) PPM code specifies the alternate paper tray be used.

COMMAND 64: MANUAL FEED TRAY ORIENTATION

This command works the same way as Command 62 except it controls the orientation for printing when the PPM Command specifies the manual feed tray for the paper source.

Values are the same as Command 62 except substitute "manual feed tray" in place of "primary tray" in the descriptions.

NOTE

When the laser printer receives the manual feed tray command, it will not print until paper is placed into the manual feed slot. This allows the user to insert special forms, letter head, or colored paper into the manual feed slot.

Example:	&%Z64,1	Specifies that all printing using paper from the manual feed slot be printed in portrait orientation

COMMAND 65: CHARACTER SET

Enables the user to make a special selection of which ASCII character set is used in the conversion from EBCDIC (SCS/LU1) or DSC (LU3) to ASCII.

VALUE	DESCRIPTION
1	Roman 8 character set
*2	Code Page 850 character set
3	IBM PC Set 2 (Code Page 437)

NOTES

The character-set substitutions defined in Commands 70 and 71 must be adjusted if the ASCII character set is changed. All previously defined substitutions are lost from NV memory when the character-set selection is changed.

This is the character set that the printer uses. It must be selected at the printer by using the front panel.

Refer to the character-set summary tables at the end of the self-test to confirm which ASCII character is printed for each of the 3270 hex codes. Both the EBCDIC and DSC tables are provided.

Example: &%Z65,1 Selects the Roman 8 character set

COMMAND 66: OUTPUT PORT

Selects the Output Port. Selections 0 and 1 ignore the initialization strings defined in commands 57 and 58.

VALUE	DESCRIPTION
*0	Parallel port
1	Serial port

Example: &%Z66,1 Directs the print output to the serial port and sends the host port initialization string defined in command 58 to the printer.

COMMAND 70: OVERWRITE EBCDIC (SCS/LU1) TRANSLATION TABLE

Custom substitutions defined by this command and stored in permanent memory are written into the EBCDIC (SCS/LU1) to ASCII translation table.

VALUE	DESCRIPTION
XX	The EBCDIC character to be changed (in hex)
YY	The substitute ASCII character for the EBCDIC character above

NOTES

Previously stored substitutions are automatically changed to the new selection when the same hex location is specified in the EBCDIC table.

Previously stored substitutions are canceled if an ASCII hex sequence of 00 is specified.

Command Z99,0 must be used to store the substitutions in permanent memory for them to be effective when the printer is next turned on.

The active EBCDIC (SCS/LU1) translation table prints out at the end of the interface self-test summary.

Example:	&%Z70,7B,40/Z99,0	Prints a 40 ASCII hex (a @ symbol) when the interface receives an EBCDIC 7B (a # symbol). The command is followed by a command Z99,0 which stores the active setup selections in permanent memory.

COMMAND 71: OVERWRITE DSC (LU3) TRANSLATION TABLE

Custom substitutions defined by this command, and stored in the permanent memory, are overwritten into the DSC (LU3) to ASCII translation table.

NOTES

This command functions similarly to Command 70 except the substitutions are applicable to the DSC (LU3) translation table. Refer to the Command 70 instructions.

The active DSC (LU3) translation table prints out at the end of the interface self-test summary.

COMMAND 72: SERIAL OUT BAUD RATE

Selects the Baud Rate for data sent from the TX/CX 4000 to the printer. A new setting will not be effective immediately. To activate the new setting, cycle power on the TX/CX 4000.

VALUE	DESCRIPTION
0	38,400 baud
1	19,200 baud
*2	9,600 baud
3	4,800 baud
4	2,400 baud
5	1,200 baud
6	600 baud
7	300 baud

Example: &%Z72,0 Sets the outgoing baud rate to 38,400

COMMAND 73: SERIAL OUT WORD LENGTH

Selects the Word Length of data sent from the TX/CX 4000 to the printer. A new setting will not be effective immediately: To activate the new setting, cycle power on the TX/CX 4000.

VALUE	DESCRIPTION
7	7 Bits
*8	8 Bits

Example: &%Z73,7 Sets the outgoing word length to 7 bits.

COMMAND 74: SERIAL OUT STOP BITS

Selects the number of Stop Bits of a data stream sent from the TX/CX 4000 to the printer. A new setting will not be effective immediately: To activate the new setting, cycle power on the TX/CX 4000.

VALUE	DESCRIPTION
*1	1 Bit
2	2 Bits

Example: &%Z75,2 Sets the number of Stop Bits to 2.

COMMAND 75: SERIAL OUT PARITY

Selects the Parity of a data stream sent from the TX/CX 4000 to the printer. A new setting will not be effective immediately: To activate the new setting, cycle power on the TX/CX 4000.

VALUE	DESCRIPTION
*0	None
1	Odd
2	Even

Example: &%Z75,2 Sets the outgoing parity to even.

COMMAND 76: INPUT BAUD

Selects the baud rate for data received at the serial-in port. A new setting will not be effective immediately: To activate the new setting cycle power on the TX/CX 4000.

VALUE	DESCRIPTION
0	38,400 baud
1	19,200 baud
*2	9,600 baud
3	4,800 baud
4	2,400 baud
5	1,200 baud
6	600 baud
7	300 baud

Example: &%Z76,0 Sets the receiving baud rate to 38,400

COMMAND 77: INPUT WORD

Selects the word length of data received at the serial-in port.
A new setting will not be effective immediately: To activate the new setting cycle power on the TX/CX 4000.

VALUE	DESCRIPTION
7	7 Bits
*8	8 Bits

Example: &%Z77,7 Sets the word length to 7 bits.

COMMAND 78: INPUT STOP

Selects the number of stop bits of a data stream received at the serial-in port. A new setting will not be effective immediately. To activate the new setting, cycle power on the TX/CX 4000.

VALUE	DESCRIPTION
*1	1 Bit
2	2 Bits

Example: &%Z78,2 Sets the number of Stop Bits to 2.

COMMAND 79: INPUT PARITY

Selects the parity of a data stream received at the serial-in port.
A new setting will not be effective immediately. To activate the new setting, cycle power on the TX/CX 4000.

VALUE	DESCRIPTION
*0	None
1	Odd
2	Even

Example: &%Z79,2 Sets the parity to even.

COMMAND 84: 6 LPI STRING

Matrix only. Generic output protocol (see command 60). Defines the 6 LPI String.

VALUE	DESCRIPTION
1	(max. 25 bytes of ASCII hex code)

NOTES

This string represents the printer-specific command to set the printer to 6 LPI. Consult your printer's manual for the appropriate hex value representing the 6 LPI command.
The printer can be set to 6 LPI mode by typing &%...

Example: &%Z84,1(1B 32) Assigns the 6 LPI command for an Epson LQ-2500 printer (hex value 1B 32) to the Host/PC download command 84.

COMMAND 85: 8 LPI STRING

Matrix only. Generic output protocol (see command 60). Defines the 8 LPI String. See command 84.

VALUE	DESCRIPTION
1	(max. 25 bytes of ASCII hex code)

Example: &%Z85,1(1B 30) Assigns the 8 LPI command for an Epson LQ-2500 printer (hex value 1B 30) to the Host/PC download command 85.

COMMAND 86: 10 CPI STRING

Matrix only. Generic output protocol (see command 60). Defines the 10 CPI String. See command 84.

VALUE	DESCRIPTION
1	(max. 25 bytes of ASCII hex code)

Example: &%Z86,1(1B 50) Assigns the 10 CPI command for an Epson LQ-2500 printer (hex value 1B 50) to the Host/PC download command 86.

COMMAND 87: 15 CPI STRING

Matrix only. Generic output protocol (see command 60). Defines the 15 CPI String. See command 84.

VALUE	DESCRIPTION
1	(max. 25 bytes of ASCII hex code)

Example: &%Z87,1(1B 67) Assigns the 15 CPI command for an Epson LQ-2500 printer (hex value 1B 67) to the Host/PC download command 87.

COMMAND 88: 12 CPI STRING

Matrix only. Generic output protocol (see command 60). Defines the 12 CPI String. See command 84.

VALUE	DESCRIPTION
1	(max. 25 bytes of ASCII hex code)

Example: &%Z88,1(1B 4D) Assigns the 12 CPI command for an Epson LQ-2500 printer (hex value 1B 4D) to the Host/PC download command 88.

COMMAND 89: 16.7 CPI STRING

Matrix only. Generic output protocol (see command 60). Defines the 16.7 CPI String. See command 84.

VALUE	DESCRIPTION
1	(max. 25 bytes of ASCII hex code)

Example: &%Z89,1(1B 10) Assigns the 16.7 (actually: 17 CPI normal draft) CPI command for an IBM Proprinter X24E (hex value 1B 10) to the Host/PC download command 89.

COMMAND 98: RESTORE FACTORY DEFAULTS

Restores the factory-default configuration selections, prints out a copy of the active configuration selections, or restores the permanent memory selections to the active setup status.

VALUE	DESCRIPTION
*0	Restores the factory setup
1	Prints out the active setup selections
2	Restores the setup selections stored in the permanent memory to active status

NOTES

If a document is printed using temporary host download commands (commands not stored using the &%Z99,0 command), value 2 will restore the permanent memory selections.

Put a &%Z98,2 at the end of the document to restore the standard setup parameters for the next user of the printer.

The active setup and permanent memory setup selections are the same after a Command &%Z99,0 or a Command &%Z98,2 is sent to the printer.

Example:	&%Z98,1	Prints out the active setup selections for review

COMMAND 99: STORE CONFIGURATION IN PERMANENT MEMORY

Send this command after all desired host download configuration commands have been sent to the interface. It stores the active setup in the permanent memory of the interface so it will be in effect whenever the printer is powered on. Otherwise, active configuration commands are lost when the printer is turned off.

VALUE	DESCRIPTION
0	To complete the command, the value 0 must be used.

NOTES

Host download selections followed by a Command &%Z99,0 will be stored in permanent memory and active when the printer is turned on.

Only use Command &%Z99,0 when the host download selection needs to be permanently stored in the memory of the interface.

Example:	&%Z99,0	Stores the currently active setup selections in the permanent memory of the interface.

7. Operation—Coax

When the printer is turned on, the interface checks for a proper 9-pin host attachment cable to determine which mode of operation is desired. If none is found, a message is shown on the front panel, and the interface waits for a proper cable to be attached. With the TX/CX 4000 installed and a coax host adapter cable attached, an ASCII printer emulates a 3287, 3262, 3812-1, 4028, 4214, or 4224 (non-IPDS) printer on a 3270-type host system.

7.1 Printer Sharing

The TX/CX 4000 allows the printer to automatically share printing from an attached PC/LAN (any parallel or serial source) and an IBM coax host. The TX/CX 4000 uses a timeout between each print to select the next printing without changing cables or switches.

At the end of a host print job, the TX/CX 4000 waits for the specified Host Port Timeout period before it honors data streams coming in through the parallel or serial ports. The Host Port Timeout period is set through Host/PC download command 51 or through the front panel. After a parallel or serial print job is completed, the interface will again wait for a period of time before it honors host print jobs. The P/S Timeout is set through Host/PC download command 50 or through the front panel.

If the PC print job is sent while a host job is printing, the printer responds as "busy" to the PC print request. The print job can be spooled through a spool program or sent to the printer when the host job is finished. If the PC's printer port is set for infinite retry through the DOS "Configure Printer" command (described in the DOS manual), the print job waits for the printer to be available to receive the data.

When the TX/CX 4000 is not processing a print job, the LCD display will show whether the interface is READY or OFF LINE and whether the selected output port (parallel or serial) is READY or NOT READY. When the TX/CX 4000 is processing a print job it will indicate from which input port the print job is coming (host, serial, or parallel) and to which output port the print job is directed (serial or parallel).

7.2 PC/LAN Printing

The TX/CX 4000 offers a serial and a parallel port to share the printer with PCs or LANs. Simply connect the PC/LAN printer server to the parallel or serial port. You can use just one or both of these sharing ports.

All data streams received by the TX/CX 4000 will be directed to the output port specified through the active configuration. The output port can be changed through the front panel or through Host/PC download command 66. Unless the Host/PC download command is placed on the first line in the first possible position of the document, the output port will not be changed until the whole document is printed. Select output port option 0 or 1, since the initialization feature only applies to switching printers during coax host printing.

The output printer specified in the TX/CX 4000's configuration (through the front panel or through Host/PC download command 60) is irrelevant for printing from one of the shared ports. For PC/LAN printing, select the appropriate printer driver on the PC/LAN printer server.

PC printing longer than 10-20 minutes (depends on host configuration) may cause the 3270-type host to drop communication with the printer ("go to sleep").

7.3 Parallel and/or Serial Initialization

If you want to change the printer's configuration for shared printing (e.g. set it to PostScript mode), use the parallel and/or serial initialization strings (Host/PC download commands 56 and 58 respectively). Consult the printer's user's guide for the ASCII hex values representing the desired configuration commands. Then store these commands in the TX/CX 4000's memory using Host/PC download commands 56 and/or 58.

After the host printing is completed, and before the print job from the parallel or serial shared port is sent to the printer, the interface will send this initialization string to the printer and configure it according to your instructions. However, it is possible that the print job coming through the parallel/serial shared port contains other printer instructions, thus overriding the parallel/serial initialization string.

7.4 Host Printing

The TX/CX 4000 will auto-detect which host environment (coax or twinax) to operate in by the cable adapter plugged into the 9-pin host connector. If no host cable adapter is connected to the interface, the front panel will display a message to connect one.

Depending on the IBM printer emulation selected, you will have access to all the features of the IBM printer the TX/CX 4000 is emulating. The interface also needs to be told which ASCII output printer (command 60) to use to convert EBCDIC data streams from the host into the ASCII format the printer can use.

In addition to the features of the emulated IBM printer, ASCII printers will often have other capabilities, which you can take advantage of using Command Pass-Thru.

7.5 Host Port Initialization

The TX/CX 4000 reconfigures the printer according to the active coax configuration settings after shared printing. If you want to modify the printer configuration further (for example, select a different font for all host printing) take advantage of the host-port initialization string. Unlike the Parallel and Serial Shared Port Initialization Strings, which are usually overridden by commands coming with the PC/LAN print job, the Host Port Initialization String is not sent to the printer until after the interface has reconfigured the printer for host printing. The initialization string is sent at the beginning of each printed page.

7.6 Connecting Two Printers

The TX/CX 4000 allows host print jobs to be sent to two different printers. Simply connect one printer via the parallel port and the other via the serial port to the interface. Verify the Serial Out Settings. Switch from one Printer Port to the other by using the Host/PC download command 66 or by changing the printer-port settings through the TX/CX 4000's front panel.

It does not matter whether the printer port is selected with or without the initialization string. In coax mode, the interface always sends the host port initialization string with each page.

7.7 Serial Printing

When printing to a serial printer, verify the current Serial Out setting: baud rate, word length, stop bits, parity. The TX/CX 4000 does not offer handshaking settings. Rather, it automatically detects if the printer is ready to receive data or not,

regardless of what handshaking method the printer is using.

The same is true for a serial connection to a PC, LAN printer server, or other ASCII device. The TX/CX 4000 will indicate to the PC, LAN printer server, or other ASCII device when it is ready to receive data and when it isn't, regardless of what handshaking method the PC, LAN printer server, or other ASCII device is using.

If you are using the serial sharing port and the serial out port, make sure that the in and out settings are comparable.

7.8 Print Position and Page Length

Table 7-1 outlines the PMPP (Physical Maximum Print Position) and PMPL (Physical Maximum Page Length) for letter, legal, and A4 size paper.

Table 7-1. Print Position and Page Length.

	PMPP at...				PMPL at...			
Paper Size	10 CPI	12CPI	15 CPI	17.1 CPI	6 LPI	8 LPI	True 6 LPI	True 8 LPI
Letter								
Portrait	80	96	120	136	66	88	63	84
Landscape	105	126	157	178	50	87	48	84
COR, HP	136	154	201	201	66	89	—	—
Legal								
Portrait	80	96	120	136	84	112	81	108
Landscape	135	162	202	230	50	67	48	64
A4								
Portrait	78	93	117	133	70	93	67	89
Landscape	112	134	167	191	49	66	47	62

7.9 Laser Printing (HP PCL protocol selected)

With the TX/CX 4000 installed and a 9-pin-to-coax host adapter cable attached, your printer emulates a 3287, 3262, 3268, 3812-1, 4028, 4214 or 4224 (non-IPDS) printer on your 3270-type host system.

Selecting Fonts

You can select a printer-resident font or a font from an optional font cartridge in the printer by entering a font change command in the document. The font change commands take the following format:

&%[P or L][font ID]

The &% (or the alternate beginning delimiter selected with command 40) is the delimiter that signals the interface that the information following is a command. The letter P (portrait) or L (landscape) controls the orientation of the printing. The font ID number selects the font to be used for printing.

For example:

&%L086 selects Prestige 12 CPI font in landscape orientation.

The font ID number must select a font available in the printer or in the installed cartridge. If the proper cartridge is not installed, or the font does not exist on the cartridge, then the printer will automatically select an alternate landscape font for printing. Multiple font changes can be made in a document as long as all fonts are in the same orientation. Changes in orientation (portrait or landscape) automatically eject the page. A font ID that changes the orientation from the previous page must be on the first line and first position of the page or a blank page will be ejected. A blank page at the beginning of a print job is often caused by a change in orientation.

7.10 Computer Output Reduction (COR)

Computer Output Reduction (COR) is an IBM printer feature that automatically rotates data processing reports to landscape orientation and compresses the text to fit 198 columns x 66 lines on the page. COR is enabled by doing the following:

1. Select APO active with command 61 (value 0) or through the front panel.

2. Select COR for the paper source with commands 62-64 (value 0) or through the front panel.

When COR is enabled, the following format changes are automatically made to data processing reports:

- The page is printed in landscape orientation.
- Vertical line height is 70% of that specified.
- An half-inch blank area is provided on the top and left edge of the paper.
- The selected pitch is changed: 10 pitch to 13.3 pitch; 12 pitch to 15 pitch; 15 pitch to 19 pitch.

A combination of control codes in the printer data stream and the settings in the configuration are used to determine page orientation when processing DSC, DSE, or LU1 (SCS) data streams.

Some applications will not allow the user to insert the data stream commands required to select orientation and format. Where the insertion of the required data-stream commands is not possible, the user can select the orientation and format desired by using the printer configuration settings. Use of the Write Control Character (WCC) in the DSC/DSE data streams for orientation and format selection is not recommended.

7.11 Automatic Print Orientation (APO)

When Automatic Print Orientation (APO) is activated (command 61, value 0) or through the front panel, the TX/CX 4000 notes the format of the print image and calculates the required print dimensions. **Figure 7-1** shows how the page size determines the orientation for coax COR.

If a calculated paper size is larger than 8 1/2" x 11", the paper-tray-orientation selection (commands) determines the orientation.

In LU3 (DSC/DSE) mode, the values used in the calculations are specified by the TX/CX 4000's active configuration selections. In LUl (SCS) mode, the values are specified in the data stream by the SCS controls. If a value has not been set in the SCS data stream, the interface's active configuration is used instead.

The APO feature also uses the calculated print width and length to determine the print orientation when the dimensions are less than 8 1/2" x 11". When the width is greater than the length and APO is active, the document prints in landscape, even if the font is specified as portrait.

The steps on the following page describe printing with the APO feature (refer to **Figure 7-1**).

1. If APO is not active (command 61, value 1; or front panel), the TX/CX 4000 uses the paper source selections (commands 62-64, or front panel) to control orientation in the active font. If APO is active, the report continues to block 2.

2. The TX/CX 4000 calculates the page size. If the page size is more than 8 1/2" x 11" the TX/CX 4000 uses the paper source selections to control the orientation in the active font. If the report is less than 8 1/2" x 11" it continues to block 3.

3. At block 3, the TX/CX 4000 checks the length and width. If the report is longer than it is wide, it prints in portrait. If the report is wider than it is long, the report prints in landscape.

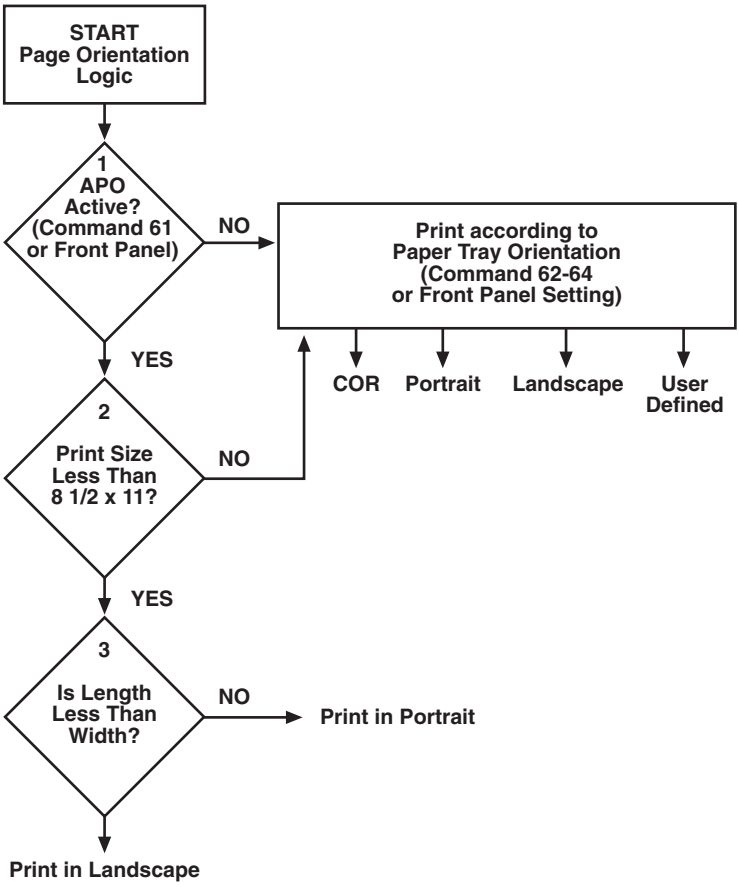

Figure 7-1. Printing with the APO Feature.

7.12 Generic Mode

The Generic output protocol should be used when the other output protocols of the TX/CX 4000 are inadequate. This could be the case with printers such as certain barcode label printers or embossers, but also with older printers from OKIDATA® or Mannesmann Tally®. Refer to the printer's user's guide to find out if the printer operates with one of the TX/CX 4000 output protocols.

In Generic mode, the TX/CX 4000 does not pass on the LPI and CPI commands from the host. Rather, it allows you to match the printer-specific CPI or LPI command with the CPI or LPI command from the host commands 84 through 89.

For example, if the printer protocol a printer requires is not available on the TX/CX 4000. To change the printer to 10 CPI, the printer's user's guide provides the hexadecimal value of 1B 50. Use the Host/PC download command 88 to assign the value 1B 50 to the 10 CPI string: Type &%Z88,1(1B 50). From now on, when the interface receives a request for 10 CPI from the host, it will send the value 1B 50 to the printer and thereby set it to 10 CPI.

If nothing is assigned to the CPI or LPI string, the interface will send nothing to the printer: It will ignore the CPI or LPI command from the host.

The interface stores commands for the following CPI and LPI values:

- 6 LPI—Host/PC download command 84
- 8 LPI—Host/PC download command 85
- 10 CPI—Host/PC download command 86
- 15 CPI—Host/PC download command 87
- 12 CPI—Host/PC download command 88
- 16.7 CPI—Host/PC download command 89

7.13 Advanced Features

There are three advanced features in the TX/CX 4000 for accessing special functions of the printers, which are not normally available on the IBM 3287 or 4224 printers. These features include:

- Command Pass-Thru
- Custom User Strings
- SCS Mode Transparent Data

Each of these features is described below.

7.13.1 COMMAND PASS-THRU

The Command Pass-Thru feature allows access to all of the built-in features of your printer, even if these features aren't normally available through the host software. Command Pass-Thru lets you place printer-specific command sequences into the data sent to the printer. The TX/CX 4000 recognizes these special sequences and "passes the command through" to the printer. The steps below describe how to use Command Pass-Thru.

1. Find the command for the print feature in the printer's user's guide.

2. Convert the printer command to hexadecimal.

3. Place the beginning delimiter &% (or the custom delimiter as defined with command 40) in the document at the point where you want the feature to take effect. This signals the start of the print feature. Enter the beginning printer command, then enter the ending delimiter &% (or the custom delimiter as defined with command 39). No spaces are allowed.

4. Move the cursor to the point in the text that you want to end the print feature. Enter the delimiter followed by the ending printer command and then the delimiter again, into the document.

For example:

If ESC E begins bold printing and ESC F ends bold printing on your printer, first convert ESC E to the hexadecimal 1B45 (ESC = 1B and E=45) and ESC F to 1B46. Then enter the commands as follows:

This is a &%1B45&%bold&%1B46&% word.

to print on the printer as:

```
This is a bold word.
```

NOTES

Only numbers or the upper case letters A–F are allowed.

Errors in the Command Pass-Thru sequence will cause the TX/CX 4000 to ignore the command and resume printing at the point the error occurred.

Command Pass-Thru may make lines shorter than you expect, since the commands take up space on the screen but do not print.

7.13.2 Custom User Strings

Host download command 55 allows you to define up to six (0 through 5) custom user strings. A user string can be a font ID, a form feed, or another printer command that is frequently used. **Section 5.17.1** describes how to define the custom user strings.

After the custom user string is defined, the string is activated by placing the delimiter (&% or the beginning delimiter defined with command 40), a capital letter U, and the number of the desired custom user string into the text of a document.

For example, use command 55 to define user string number 3 to send a form feed as follows (FF = 0C in hex):

&%Z55,3(0C)

Then, to send a form feed at the end of a print job, enter the following at the end of the document:

&%U3

Print the document, and the TX/CX 4000 will send the 0C, or form feed, command to the printer when it encounters the &%U3 code.

7.13.3 SCS Mode Transparent Data

SCS transparent mode (SCS TRN code 35) provides a method for transparent data transmission when operating in LU1 mode. To use this method, you must be connected to a system using SNA protocol and be operating as a Logical Unit Type 1.

An SCS TRN sequence begins with a one-byte binary count immediately following the TRN code. The count indicates the number of bytes, not including the count byte, of transparent data to follow. Up to 256 bytes of transparent data can be sent in each sequence.

SCS TRN data is user-defined and is not scanned for SCS control codes. However, to emulate the characteristics of the IBM 3287, non-printable characters (i.e., control characters) are converted to hyphens. Data is translated to ASCII with undefined characters printed as hyphens. The TX/CX 4000 offers a configurable option to emulate the IBM 3287 or to pass the data without translation. Refer to command 45, SCS TRN translate.

8. Troubleshooting

This chapter provides instructions for performing diagnostic tests on the TX/CX 4000, and a problem-resolution guide that describes common problems with the TX/CX 4000 or the printer and their solutions. If you are unable to solve a problem by following the procedures outlined in this chapter, contact technical support.

Before calling, verify that the TX/CX 4000 is installed correctly, that the TX/CX 4000 configuration settings are correct, perform the appropriate diagnostic tests outlined in this chapter, and have the following information ready:

- Printer and TX/CX 4000 self-test printouts
- Model number and serial number of the interface
- Description of the problem
- Results of diagnostic tests
- Type of host system or controller

You may also need to print a "hex dump" or "buffer print" by enabling the Buffer Print option in the front panel setup options. This causes all printing to be in hexadecimal code, just as it's received from the host, to help in tracing problems.

If you need to ship the interface, use the original carton and packaging to prevent damage.

8.1 Interface Self-Test

Verify proper installation and configuration of the TX/CX 4000 by performing an interface self-test. The self-test prints out the current software version, memory condition (RAM and ROM), and the current configuration selections. Follow the steps below to start the self-test from the TX/CX 4000's front panel.

1. Make sure the proper 9-pin host adapter is attached.
2. Verify that the printer is connected properly to the interface.
3. Power on the printer and wait for it to go to "READY" mode.
4. Power on the TX/CX 4000. Its LCD screen should display "3X/AS-400. . . Ready (ParOut/SerOut)".
5. Enter the front-panel mode by pressing the Menu button on the TX/CX 4000's front panel. Be sure that the proper printer output is selected.
6. Press the Menu button a second time to display TEST MENU.

7. Press List to display the “Self-Test Printout” option.

8. Press the Select button. The self-test will print out in a few seconds.

9. Cycle power when done.

The self-test can also be started through Host/PC download command.

Use Host/PC download command &%Z98,1 to start the self-test.

Two self-test pages will print if the TX/CX 4000 is installed properly. A sample printout of the first page is shown on the following page. The selections in the sample are factory defaults. The numbers at the left margin are command numbers used to change this setting using twinax host download commands.

If the test does not print, the interface failed the self-test. Contact technical support for assistance.

Twinax Self-Test PrintoutDefault GenericPage 1

Twinax Interface
Software Version 1.00 Twinax Level 1.00

RAM OK
ROM OK

Twinax Setup Selections :

#00 - Twinax Address	:	0
#01 - Alt. CPT Start Delimiters	:	50 6C
#02 - Alt. CPT End Delimiters	:	50 6C
#03 - Twinax Port Timeout	:	08 - seconds
#05 - Host Language	:	00 - Multinational
#16 - Override Host	:	0 - No Overrides
#17 - ASCII Codes	:	1 - Code Page 850
#20 - Twinax Drive	:	0 - Normal
#22 - Print Quality	:	0 - Default Draft
#24 - IBM Emulation	:	0 - 5256
#25 - Carriage Cmds	:	0 - Use Formfeeds
#26 - Line Length	:	0 - Wrap beyond 8”
#50 - Parallel Serial Timeout	:	08 - seconds
#60 - Output Printer	:	9 - Generic Strings
#66 - Output Port	:	0 - Parallel
#76 - Input Baud	:	2 - 9600
#77 - Input Word	:	8 - 8 bits
#78 - Input Stop :		1 - 1 bit
#79 - Input Parity	:	0 - None

#11 - Twinax Port Initialization:
#56 - Parallel Port Initialization:
#58 - Serial Port Initialization:
#84 - Generic Emulation 6LPI String:
#85 - Generic Emulation 8LPI String:
#86 - Generic Emulation 10CPI String:
#87 - Generic Emulation 15CPI String:
#88 - Generic Emulation 12CPI String:
#89 - Generic Emulation 16.7CPI String:

Figure 8-1. Twinax Self-Test Printout Page 1.

Twinax Self-Test PrintoutDefault GenericPage 2

#04 - User Defined Strings:
U0:
U1:
U2:
U3:
U4:
U5:
U6:
U7:
U8:
U9:

Figure 8-2. Twinax Self-Test Printout Page 2.

	40	50	60	70	80	90	A0	B0	C0	D0	E0	F0
0:	20	26	2D	9B	9D	F8	E6	BD	7B	7D	5C	30
1:	20	82	2F	90	61	6A	7E	9C	41	4A	00	31
2:	83	88	B6	D2	62	6B	73	BE	42	4B	53	32
3:	84	89	8E	D3	63	6C	74	FA	43	4C	54	33
4:	85	8A	B7	D4	64	6D	75	9F	44	4D	55	34
5:	A0	A1	B5	D6	65	6E	76	F5	45	4E	56	35
6:	C6	8C	C7	D7	66	6F	77	F4	46	4F	57	36
7:	86	8B	8F	D8	67	70	78	AC	47	50	58	37
8:	87	8D	80	DE	68	71	79	AB	48	51	59	38
9:	A4	E1	A5	60	69	72	7A	F3	49	52	5A	39
A:	5B	5D	7C	3A	AE	A6	AD	AA	2D	FB	FD	FC
B:	2E	24	2C	23	AF	A7	A8	B3	93	96	E2	EA
C:	3C	2A	25	40	D0	91	D1	EE	94	81	99	9A
D:	28	29	5F	27	EC	F7	ED	F9	95	97	E3	EB
E:	2B	3B	3E	3D	E8	92	E7	EF	A2	A3	E0	E9
F:	21	5E	3F	22	F1	CF	A9	F2	E4	98	E5	20

Figure 8-3. EBCDIC to ASCII Translate Table.

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Twinax Self-Test PrintoutLaser    Page 1

TWINAX INTERFACE
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SOFTWARE VERSION 1.00  Twinax Level 1.00

RAM OK
ROM OK

Twinax Setup Selections :
#00 - Twinax Address                :        0
#01 - Alt. CPT Start Delimiters     :        50 6C
#02 - Alt. CPT End Delimiters       :        50 6C
#03 - Twinax Port Timeout           :        08 - seconds
#05 - Host Language                 :        00 - Multinational
#06 - Portrait                      :        0 - No
#07 - Landscape          :          0 - No
#08 - APO                           :        0 - No
#09 - Paper Size         :          0 - Host Selected
#10 - True LPI                      :        0 - Compress LPI
#13 - Paper Drawer 1                :        1 - Tray 1
#14 - Paper Drawer 2                :        4 - Tray 4
#15 - Paper Drawer 3                :        5 - Tray 5
#16 - Override Host                 :        0 - No Overrides
#17 - ASCII Codes                   :        1 - Code Page 850
#18 - Vertical Margin Adjust        :        00
#19 - Horizontal Margin Adjust      :        00
#20 - Twinax Drive                  :        0 - Normal
#32 - 11 x 17 (A3)                  :        0 - No
#33 - Duplexing          :          0 - None
#50 - Parallel Serial Timeout       :        08 - seconds
#60 - Output Printer                :        2 - HP-PCL 3812
#66 - Output Port                   :        0 - Parallel
#76 - Input Baud                    :        2 - 9600
#77 - Input Word                    :        8 - 8 bits
#78 - Input Stop         :          1 - 1 bit
#79 - Input Parity                  :        0 - None

#11 - Twinax Port Initialization:
#56 - Parallel Port Initialization:
#58 - Serial Port Initialization:
```

Table 8-4. Twinax Self-Test Printout, Laser, Page 1.

```
Twinax Self-Test PrintoutLaser    Page 2

#04 - User Defined Strings:
  U0:
  U1:
  U2:
  U3:
  U4:
  U5:
  U6:
  U7:
  U8:
  U9:

#21 - User Defined Fonts:
   0:
   1:
   2:
   3:
   4:
   5:
   6:
   7:
   8:
   9:
```

Figure 8-5. Twinax Self-Test Printout, Laser, Page 2.

	40	50	60	70	80	90	A0	B0	C0	D0	E0	F0
0:	20	26	2D	9B	9D	F8	E6	BD	7B	7D	5C	30
1:	20	82	2F	90	61	6A	7E	9C	41	4A	00	31
2:	83	88	B6	D2	62	6B	73	BE	42	4B	53	32
3:	84	89	8E	D3	63	6C	74	FA	43	4C	54	33
4:	85	8A	B7	D4	64	6D	75	9F	44	4D	55	34
5:	A0	A1	B5	D6	65	6E	76	F5	45	4E	56	35
6:	C6	8C	C7	D7	66	6F	77	F4	46	4F	57	36
7:	86	8B	8F	D8	67	70	78	AC	47	50	58	37
8:	87	8D	80	DE	68	71	79	AB	48	51	59	38
9:	A4	E1	A5	60	69	72	7A	F3	49	52	5A	39
A:	5B	5D	7C	3A	AE	A6	AD	AA	2D	FB	FD	FC
B:	2E	24	2C	23	AF	A7	A8	B3	93	96	E2	EA
C:	3C	2A	25	40	D0	91	D1	EE	94	81	99	9A
D:	28	29	5F	27	EC	F7	ED	F9	95	97	E3	EB
E:	2B	3B	3E	3D	E8	92	E7	EF	A2	A3	E0	E9
F:	21	5E	3F	22	F1	CF	A9	F2	E4	98	E5	20

Figure 8-6. EBCDIC to ASCII Translate Table.

```
Coax Self-Test PrintoutDefault Generic   Page 1

3270 Coax Interface
Copyright 1995
Rom OK
Ram OK
Software Version 2.00  Coax Level 1.30
Active Configuration Selections:
01 Buffer Size (Characters)          :        2 1920
02 Lines Per Inch (LPI)              :        6
03 Characters Per Inch (CPI)         :        10
04 Line Spacing                :              1 Single (6 or 8 LPI)
05 Form Length (MPL)                 :        066
06 Maximum Print Position (MPP)      :        132
07 Print Case                        :        1 Dual
08 LU1 Language                      :        01 English (US)
11 Paper Path                        :        2 Primary
12 FF Before Local Screen Copy       :        0 No
13 FF After Local Screen Copy :      0 No
14 LU3 Print Image(Non-SCS Mode)     :        0 LU3 and Local Copy Null linesuppression
15 CR at MPP + 1                     :        0 Next Line
16 NL at MPP + 1                     :        0 Current line + 2
17 Valid FF Followed by Data         :        0 2nd PP
18 Valid FF at End of Buffer         :        1 Line 1
19 FF Valid Location                 :        0 FF valid at 1st PP or MPP + 1
20 Auto Function at End of Job       :        0 NL
25 Form Feed Usage             :     0 FF
26 Suppress Empty Forms              :        0 No
27 Form Feed After Time Elapse       :        0 No
30 Override of formatting cmds       :        0 Disable
31 Truncate/Wrap select              :        0 Wrap text beyond MPP
34 Interv Required (IR) Time out     :        120 Times 5 Seconds
35 Program Attn (PA) Response        :        1 Auto PA1
36 Suppress Host Control Codes       :        0 No IBM control codes suppressed
37 Vertical Channel Select (VCS)     :        1 3268/4224
39 CPT Ending Delimiter(ASCII)       :        2625 (&%)
40 CPT Delimiter Chars (ASCII)       :        2625 (&%)
41 Command ID Char (ASCII):          5A (Z)
42 Start/Stop Buffer Hex Dump        :        0 No Action
45 SCS TRN Translate                 :        1 3287 emulation, SCS cmd 35
50 Parallel/Serial Port Time Out     :        08 Seconds
51 Coax Port Time out                :        10 Seconds
55 Custom User Strings               :
   U0:
   U1:
   U2:
   U3:
   U4:
   U5:
56 Parallel Port Init String:
   SP:
57 Coax Port Init String:
   CP:
58 Serial Port Init String:
   SS:
60 ASCII Print Protocol              :        9 Generic matrix
65 Character Set Selection           :        2 Code Page 850
66 Output Port to Printer            :        0 Parallel
76 - 79 Serial Input Parameters:     9600,N,8,1
84 - Generic 6LPI String             :
85 - Generic 8LPI String             :
86 - Generic 10CPI String            :
```

Figure 8-7. Coax Self-Test Printout Default Generic, Page 1.

```
Coax Self-Test PrintoutDefault Generic   Page 2

87 - Generic 15CPI String      :
88 - Generic 12CPI String      :
89 - Generic 16.7CPI String    :
```

Figure 8-8. Coax Self-Test Printout, Default Generic,Page 2.

SCS (LU1) EBCDIC to ASCII Translate Table

EBCDIC	40	50	60	70	80	90	A0	B0	C0	D0	E0	F0
0:	20	26	2D	9B	9D	F8	E6	BD	7B	7D	5C	30
1:	20	82	2F	90	61	6A	7E	9C	41	4A	00	31
2:	83	88	B6	D2	62	6B	73	BE	42	4B	53	32
3:	84	89	8E	D3	63	6C	74	FA	43	4C	54	33
4:	85	8A	B7	D4	64	6D	75	9F	44	4D	55	34
5:	A0	A1	B5	D6	65	6E	76	F5	45	4E	56	35
6:	C6	8C	C7	D7	66	6F	77	F4	46	4F	57	36
7:	86	8B	8F	D8	67	70	78	AC	47	50	58	37
8:	87	8D	80	DE	68	71	79	AB	48	51	59	38
9:	A4	E1	A5	60	69	72	7A	F3	49	52	5A	39
A:	5B	5D	7C	3A	AE	A6	AD	AA	2D	FB	FD	FC
B:	2E	24	2C	23	AF	A7	A8	B3	93	96	E2	EA
C:	3C	2A	25	40	D0	91	D1	EE	94	81	99	9A
D:	28	29	5F	27	EC	F7	ED	F9	95	97	E3	EB
E:	2B	3B	3E	3D	E8	92	E7	EF	A2	A3	E0	E9
F:	21	5E	3F	22	F1	CF	A9	F2	E4	98	E5	20

DSC (LU3) DBC to ASCII Translate Table

DBC	00	10	20	30	40	50	60	70	80	90	A0	B0
0	00	20	30	26	85	84	B7	8E	61	71	41	51
1	00	3D	31	2D	8A	89	D4	D3	62	72	42	52
2	00	27	32	2E	8D	8B	DE	D8	63	73	43	53
3	00	22	33	2C	95	94	E3	99	64	74	44	54
4	00	2F	34	3A	97	81	EB	9A	65	75	45	55
5	00	5C	35	2B	C6	83	C7	B6	66	76	46	56
6	00	7C	36	AA	E4	88	E5	D2	67	77	47	57
7	99	DD	37	EE	98	8C	59	D7	68	78	48	58
8	3E	3F	38	F8	85	93	41	E2	69	79	49	59
9	3C	21	39	00	8A	96	45	EA	6A	7A	4A	5A
A	5B	24	E1	5E	82	A0	45	B5	6B	91	4B	92
B	5D	BD	F5	7E	8D	82	49	90	6C	9B	4C	9D
C	29	9C	23	F9	95	A1	4F	D6	6D	86	4D	8F
D	28	BE	40	60	97	A2	55	E0	6E	87	4E	80
E	7D	FA	25	EF	81	A3	59	E9	6F	3B	4F	3B
F	7B	CF	5F	F7	87	A4	43	A5	70	2A	50	2A

Figure 8-9. ASCII Translate Tables.

```
3270 Coax Interface
Copyright 1995
Rom OK
Ram OK
Software Version 2.00  Coax Level 1.30
Active Configuration Selections:
01 Buffer Size (Characters)      :          2 1920
02 Lines Per Inch (LPI)          :          6
03 Characters Per Inch (CPI)     :          10
04 Line Spacing      :                      1 Single (6 or 8 LPI)
05 Form Length (MPL)             :          066
06 Maximum Print Position (MPP):            132
07 Print Case        :                      1 Dual
08 LU1 Language      :                      01 English (US)
09 Active Font       :                      00011
11 Paper Path        :                      2 Primary
12 FF Before Local Screen Copy:             0 No
13 FF After Local Screen Copy:0 No
14 LU3 Print Image(Non-SCS Mode):           0 LU3 and Local Copy Null line suppression
15 CR at MPP + 1     :                      0 Next Line
16 NL at MPP + 1     :                      0 Current line + 2
17 Valid FF Followed by Data     :          0 2nd PP
18 Valid FF at End of Buffer     :          1 Line 1
19 FF Valid Location             :          0 FF valid at 1st PP or MPP + 1
20 Auto Function at End of Job:             0 NL
25 Form Feed Usage:              0 FF
26 Suppress Empty Forms          :          0 No
27 Form Feed After Time Elapse:             0 No
30 Override of formatting cmds:             0 Disable
31 Truncate/Wrap select          :          0 Wrap text beyond MPP
32 Paper Size (Laser)            :          0 Letter
34 Interv Required (IR) Time out:           120 Times 5 Seconds
35 Program Attn (PA) Response:              1 Auto PA1
36 Suppress Host Control Codes:             0 No IBM control codes suppressed
37 Vertical Channel Select (VCS):           1 3268/4224
39 CPT Ending Delimiter(ASCII):             2625 (&%)
40 CPT Delimiter Chars (ASCII):             2625 (&%)
41 Command ID Char (ASCII):                 5A (Z)
42 Start/Stop Buffer Hex Dump:              0 No Action
45 SCS TRN Translate             :          1 3287 emulation, SCS cmd 35
50 Parallel/Serial Port Time Out:           08 Seconds
51 Coax Port Time out            :          10 Seconds
55 Custom User Strings:
   U0:
   U1:
   U2:
   U3:
   U4:
   U5:
56 Parallel Port Init String:
   SP:
57 Coax Port Init String:
   CP:
58 Serial Port Init String:
   SS:
60 ASCII Print Protocol          :          2  HP LaserJet PCL-4
61 Auto Print Orientation (Laser)  :             1 No
62 Primary Tray Options (Laser)   :             0 COR
63 Alternate Tray Options (Laser)  :            0 COR
```

Figure 8-10. Coax Self-Test PrintoutLaser, Page 1.

```
64 Manual Feed Options (Laser)          :          0 COR
65 Character Set Selection      :       1 Roman 8
66 Output Port to Printer       :       0 Parallel
76 - 79 Serial Input Parameters:        9600,N,8,1
```

Figure 8-11. Coax Self-Test Printout Laser, Page 2.

SCS (LU1) EBCDIC to ASCII Translate Table

EBCDIC	40	50	60	70	80	90	A0	B0	C0	D0	E0	F0
0:	20	26	2D	9B	9D	F8	E6	BD	7B	7D	5C	30
1:	20	82	2F	90	61	6A	7E	9C	41	4A	00	31
2:	83	88	B6	D2	62	6B	73	BE	42	4B	53	32
3:	84	89	8E	D3	63	6C	74	FA	43	4C	54	33
4:	85	8A	B7	D4	64	6D	75	9F	44	4D	55	34
5:	A0	A1	B5	D6	65	6E	76	F5	45	4E	56	35
6:	C6	8C	C7	D7	66	6F	77	F4	46	4F	57	36
7:	86	8B	8F	D8	67	70	78	AC	47	50	58	37
8:	87	8D	80	DE	68	71	79	AB	48	51	59	38
9:	A4	E1	A5	60	69	72	7A	F3	49	52	5A	39
A:	5B	5D	7C	3A	AE	A6	AD	AA	2D	FB	FD	FC
B:	2E	24	2C	23	AF	A7	A8	B3	93	96	E2	EA
C:	3C	2A	25	40	D0	91	D1	EE	94	81	99	9A
D:	28	29	5F	27	EC	F7	ED	F9	95	97	E3	EB
E:	2B	3B	3E	3D	E8	92	E7	EF	A2	A3	E0	E9
F:	21	5E	3F	22	F1	CF	A9	F2	E4	98	E5	20

DSC (LU3) DBC to ASCII Translate Table

DBC	00	10	20	30	40	50	60	70	80	90	A0	B0
0	00	20	30	26	85	84	B7	8E	61	71	41	51
1	00	3D	31	2D	8A	89	D4	D3	62	72	42	52
2	00	27	32	2E	8D	8B	DE	D8	63	73	43	53
3	00	22	33	2C	95	94	E3	99	64	74	44	54
4	00	2F	34	3A	97	81	EB	9A	65	75	45	55
5	00	5C	35	2B	C6	83	C7	B6	66	76	46	56
6	00	7C	36	AA	E4	88	E5	D2	67	77	47	57
7	99	DD	37	EE	98	8C	59	D7	68	78	48	58
8	3E	3F	38	F8	85	93	41	E2	69	79	49	59
9	3C	21	39	00	8A	96	45	EA	6A	7A	4A	5A
A	5B	24	E1	5E	82	A0	45	B5	6B	91	4B	92
B	5D	BD	F5	7E	8D	82	49	90	6C	9B	4C	9D
C	29	9C	23	F9	95	A1	4F	D6	6D	86	4D	8F
D	28	BE	40	60	97	A2	55	E0	6E	87	4E	80
E	7D	FA	25	EF	81	A3	59	E9	6F	3B	4F	3B
F	7B	CF	5F	F7	87	A4	43	A5	70	2A	50	2A

Figure 8-12. ASCII Translate Tables.

8.2 Buffer Print

You can set the TX/CX 4000 up to print the buffer in hexadecimal code. This can be useful for a programmer to debug problems with the application software, TX/CX 4000, or the printer.

The EBCDIC hex data is printed on a grid corresponding to the data's position in the buffer. If the hex data represents a printable character, that character is printed below the hex data in twinax.

Start the buffer hex dump from the TX/CX 4000's front panel as follows:

1. Make sure the proper 9-pin host adapter is attached.
2. Verify that the printer is connected properly to the TX/CX 4000.
3. Power on the printer and wait for it to go to "READY" mode.
4. Power on the TX/CX 4000. Its LCD screen should display "3X/AS-400 Sync Line ParOut (Ser) Ready".
5. Enter the front panel mode by pressing the Menu button on the TX/CX 4000's front panel.
6. Press Menu twice to enter the BASIC SETUP MENU.
7. Press List until "#42 - Buffer Print" is displayed.
8. Press Alt to display "1 - Yes".
9. Press the Select button to activate the selection.
10. Press Menu until the Exit option is displayed.
11. Press Select to return to normal mode.

To start the buffer hex dump through Host/PC Download:

1. Use the "&%Z42,1" command to activate the buffer print.
2. To stop the buffer hex dump, use the "&%Z42,2" command.

8.3 Hard Loopback

The TX/CX 4000 performs a hard loopback test by transmitting data to itself and checking for error messages to occur. A qualified technician can use this test to check the circuitry with an oscilloscope.

Take the following steps to put the TX/CX 4000 into a hard loopback.

1. Disconnect the host cable(s) from the 9-pin host adapter, but leave the host adapter connected to the TX/CX 4000.
2. Verify that the printer is properly connected.
3. Power on the TX/CX 4000.
4. Enter the front-panel mode by

pressing the Menu button on the TX/CX 4000's front panel.

5. Press Menu again to select the TEST MENU.

6. Press the List button until "Hard Loopback" is displayed.

7. Press the Select button. The TX/CX 4000 will start the hard loopback test.

8. Power off the TX/CX 4000 to end the hard loopback test.

8.4 Self-Diagnostics

The TX/CX 4000 can be set up to perform a complete analysis of its functions. It transmits data to itself and then analyzes how that data is processed. If an error is detected, an error message is printed on the printer. Diagnostic error messages are listed in **Table 8-1**.

Follow the steps below to perform TX/CX 4000 self-diagnostics.

1. Disconnect the host cable(s) from the 9-pin host adapter, but leave the host adapter connected to the TX/CX 4000.

2. Verify that the printer is connected properly to the TX/CX 4000.

3. Power on the printer and wait for it to go to "READY" mode.

4. Power on the TX/CX 4000. The LCD screen should display "3X/AS-400 No Sync Line Par/Ser/Out Ready".

5. Enter the front-panel mode by pressing the Menu button on the TX/CX 4000's front panel.

6. Press Menu again to select TEST MENU.

7. Press the List button until "Twinax Diagnostics" is displayed.

8. Press the Select button. The TX/CX 4000 will start the self-diagnostics program and repeat it until it is powered off. After each completed self-diagnostic, the TX/CX 4000 will send the following message to the printer:

TEST SEQUENCE COMPLETE

Because a laser printer will only print full pages, it will store these and other messages in the printer buffer until enough messages are accumulated to fill up one page. If you want to examine the diagnostics results before a page is filled up, use the laser printer's "print data in buffer" option.

9. Power off the TX/CX 4000 to end the self-diagnostics program.

Any error messages are printed between the "TEST SEQUENCE COMPLETE" messages.

Table 8-1. Error Messages.

Error Message	Description	Probable Cause
Output Timing Error	The twinax output circuits are not responding to the microprocessor as expected.	A circuit is not functioning or a terminated cable is not attached to the TX/CX 4000.
Unexpected Vector or Improper Byte Vector	The interrupt-handling process received an improper interrupt value.	Initialization problems, non-functioning circuits, or microprocessor problems.
Error in Poll Address X	A poll test was sent to the indicated address but was not received properly.	A terminated cable is not properly installed, a circuit is not functioning, or connections are intermittent.
Incorrect Data on Poll to Address X	A poll was sent to the indicated address and was detected as a poll; however, the data received was not the expected data.	Problem with the twinaxial receiver circuitry.
No Interrupt on Data	A byte of data (not a poll) was sent, and the receiver circuitry did not interrupt the microprocessor.	Problems in the receiver circuitry or problems with the microprocessor interrupts.

Table 8-1. Error Messages (continued).

Error Message	Description	Probable Cause
Output Data Available Bit Bad	The transmitter timing is not staying busy for the proper period.	This indicates an ASIC failure.
Input Data Available Bit Bad	The bit signaling that data was received was not set as expected.	A properly terminated cable is not attached, a driver-circuitry failure, a receiver-circuit failure, or an ASIC failure.
No Interrupt on Bad Parity or Wrong Interrupt on Bad Parity	This test sends a transmission with the parity purposely invalid to test the proper reaction. Either no interrupt or the wrong interrupt was received in this test.	This indicates an ASIC failure.
Interrupt Without NMI on Poll to Address X	During a poll test, the transmission was received as data, not as a poll.	This indicates an ASIC failure.
Input Not Indicating Busy	This is an ASIC internal test during a transmission.	This indicates an ASIC failure.

Table 8-1. Error Messages (continued).

Error Message	Description	Probable Cause
Two Byte Data Checks Bad	This test verifies multi-byte data transmissions for proper data.	A failure could be caused by a -5 volt supply problem, a transmitter circuit failure, a receiver circuit failure, or an ASIC failure.
Overflow Counter Bad	This tests the protection circuit in the ASIC designed to prevent a host failure from over-filling the interface buffer and causing an error in operation.	This indicates an ASIC failure.
Bad Data— Expecting XX Received YY	A byte of data was sent, and the receiver circuitry interrupted the microprocessor. However, when the data was checked it was not the same as when it was sent.	This indicates a problem with the twinaxial circuitry data paths.

Table 8-1. Error Messages (continued).

Error Message	Description	Probable Cause
Parity Error Detected or Parity Failure	This error indicates that the twinaxial receiver detected a parity error on receiving polls or data.	This indicates an error in the parity generation by the twinaxial output, a malfunctioning of the parity-checking circuit of the twinaxial receiver, or a poor cable connection.

8.5 Solving Problems

The following is a general guide to resolve common problems that may occur. Please refer to this guide before contacting technical support.

Table 8-2. Problem Resolution Guide.

Problem or Message	Probable Cause	Action
"Printer not ready" message at host	Printer not in a ready status	Make sure printer is on line, has paper, etc.
"No Sync" message on interface	Host is not configured for a printer at the address specified	Make sure the host is properly configured for the printer
	Configuration or address is incorrect	Make sure the host is configured for the 3812-1 (non-IPDS) printer at the proper address.

Table 8-2. Problem Resolution Guide (continued).

Problem or Message	Probable Cause	Action
	Host is not operating	Check host system.
	Damaged or improper cabling	Check host cabling for damage or improper connection.
	Twinax cable improperly terminated	Make sure the prior device is not terminated (some PC emulator cards may terminate mid-line).
	Twisted pair cabling is not attached to an “active” or boosted hub	Activate Star Panel Overdrive (front panel or host/PC download command 20)
“No Sync” message and “Sync” flash alternately	Address conflict with another twinax device on the cable	Make sure no other devices on this cable have the same address.
	Damaged or improper host cables	Check host cabling for damage or improper connection
“Parallel Out - Not Ready” or “Serial Out - Not Ready” message on front panel	Printer fault, such as paper out, paper jam, etc.	Make sure the printer has paper, is clear of jams, etc.

Table 8-2. Problem Resolution Guide (continued)

Problem or Message	Probable Cause	Action
	Damaged or loose printer cable	Check printer cable for damage or improper connection.
Printer loses host communication (drops off line)	Improper or damaged cabling	Check host cabling for improper connections or damage.
	Twisted-pair cabling is not attached to an "active" or boosted hub	Activate Star Panel Overdrive (front panel or host/PC download command 20)
Right margin is cut off	Page width in word-processing program is not set wide enough	Change to a wider page
	Page width is too wide	Select a narrower page.
Extra blank sheets are ejected between sheets of printout	Form length not correct in software (maximum length is 66 lines)	Make sure the document length doesn't exceed the maximum number of lines.
	Page orientation was changed	The printer may eject a blank page when the page orientation (portrait or landscape) is changed.
Form length is incorrect	Form length incorrect in software	Change form length

Table 8-2. Problem Resolution Guide (continued).

Problem or Message	Probable Cause	Action
	Incorrect configuration at the host	Make sure the host configuration matches the printer's.
Printer won't change fonts	Incorrect typestyle number	Make sure the font ID used is valid. Invalid font IDs are ignored by the printer.
	Wrong font cartridge loaded	Load the cartridge with the font that corresponds to the font ID.
	Font cartridge damaged or not seated into the printer properly	If possible try a known good cartridge to determine if cartridge is faulty. Make sure the cartridge is loaded properly.
Printer does not print landscape in requested font	Did not select a rotation in the word-processing program	Select 90° or 270° rotation in the program
	Did not select a rotation (STO) in the data-processing OCL statement	Add a 90° or 270° orientation instruction to the OCL statement.

Table 8-2. Problem Resolution Guide (cointinued).

Problem or Message	Probable Cause	Action
	APO feature is ON and page size is 8 1/2" x 14" or less; and width is less than height	Turn APO off or increase page size so it is larger than 8-1/2" x 14"; or change width and height so width is greater than height. Refer to **Section 5.10** or **7.10** and **7.11** for more information.
	APO feature is OFF and orientation is set to COR; COR, host selected; or portrait	Set TX/CX 4000 orientation to landscape.
Printer does not print portrait in requested font	Selected a rotation in the word-processing program	Deselect rotation setting in the word-processing program.
	Selected a rotation (STO) in the data-processing OCL statement	Deselect rotation setting in OCL statement.
	APO feature is ON and page size is 8 1/2" x 14" or less; and width is greater than height	Turn APO off or increase page size so it is larger than 8-1/2" x 14"; or change width and height so width is less than height. Refer to **Section 5.10** (twinax) or **Sections 7.10** and **7.11** (coax).

Table 8-2. Problem Resolution Guide (continued).

Problem or Message	Probable Cause	Action
	APO feature is OFF and orientation is set to COR; COR, host override allowed; or landscape	Set TX/CX 4000 orienation to portrait.
Printer does not print COR	APO feature is ON and page size is 8 1/2" x 14" or less	Turn APO off or increase page size so it is larger than 8 1/2" x 14".
	APO feature is OFF and orientation is set to portrait or landscape	Set orientation to COR.
	APO feature is OFF and orientation is set to COR; COR, host selected	Set orientation to “COR selected” or change host settings.
	AS/400 only: Rotation in data processing printer file is set to *COR and other host print quality in printer file is ^STD	Select a print quality other than ^STD in printer file.
DisplayWrite/36 or Office Vision/400 document prints incorrectly	There might be an error while using DisplayWrite/36 or Office Vision/400	Choose “yes” to printer error log on page 3 of the Print Option Screen.

Appendix: Pinouts

A.1 Serial Port Specifications

The TX/CX 4000 uses a standard RS-232C, 25-pin serial printer cable for connection to a serial printer and for connection to a serial PC/LAN print server port.

The TX/CX 4000's input and output connectors use the same pin assignments.

Table A-1. Input and Output Connector Pinnings.

Shell:	Chassis Ground
1:	Chassis Ground
2:	Transmit (TXD) .....output
3:	Receive (TXD) .....input
4:	Request To Send (RTS) .....output
5:	Clear To Send (CTS) .....input
6:	Data Set Ready (DSR) .....input
7:	Signal Ground
8-19:	No connection
20:	Data Terminal Ready (DTR) .....output

The serial printer cable shipped with the TX/CX 4000 has the pin assignments shown in **Table A-2**.

Table A-2. Pin Assignments for the Serial Printer Cable.

DB25F	DB25M
Shell	Shell
2	3
3	2
5, 6, 8	20
7	7
20	5, 6, 8

A.2 Parallel Port Specifications

The TX/CX 4000 uses standard 36-pin/25-pin Centronics printer cables for connection to a parallel printer and to connect a parallel PC/LAN printer server port.

The 25-pin connector on the TX/CX 4000 has the pin assignments shown in **Table A-3**.

Table A-3. Pin Assignments for the 25-Pin Parallel Connector on the TX/CX 4000.

Pin Number	Direction	Name
1	Output	nStrobe
2-9	Output	Data 1 - Data 8
10	Input	nAck
11	Input	Busy
12	Input	PError
13	Input	Select
14	Output	nAutoFd (held high for future use only)
15	Input	nFault
16	Output	nInit (pulled high by 1 K ohm resistor)
17	Output	nSelectIn (held low)
18-25		Signal Ground
Shell		Chassis Ground

The 36-pin connector on the TX/CX 4000 uses the pin assignments shown in **Table A-4**.

Table A-4. Pin Assignments for the 36-Pin Connector on the TX/CX 4000.

Pin Number	Direction	Name
1	Input	nStrobe
2-9	Input	Data 1 - Data 8
10	Output	nAck
11	Output	Busy
12	Output	PError
13	Output	Select
14	Input	Reserved for future use
15		No connection
16		Signal Ground
17		Chassis Ground
18	Output	Pulled high by 3.3 K ohms
19-30, 33		Signal Ground

Table A-4 (continued). Pin Assignments for the 36-Pin Connector on the TX/CX 4000.

Pin Number	Direction	Name
31	Input	nSelectIn (an Acknowledge will be generated in response to this input going active; however, the interface will not be reset)
32	Input	nFault
34-36		No connection
Shell		Chassis Ground

A.3 Cabling Specifications

Table A-5. 25-to-36 Parallel Cable Pinout.

DB25 Connector Pin Number	AT Standard TTL Levels Signal Name	36-Pin Connector
1	Strobe	1
2	Data Bit 0	2
3	Data Bit 1	3
4	Data Bit 2	4
5	Data Bit 3	5
6	Data Bit 4	6
7	Data Bit 5	7
8	Data Bit 6	8
9	Data Bit 7	9
10	Acknowledge	10
11	Busy	11
12	P. End (Out of Paper)	12
13	Select	13

Table A-5 (continued). 25-to-36 Parallel Cable Pinout.

DB25 Connector Pin Number	AT Standard TTL Levels Signal Name	36-Pin Connector
14	Auto Feed	14
15	Error	32
16	Initialize Printer	31
17	Select Input	36
18-25	Ground	19, 21, 23, 25, 27, 29, 30, 33