S246-0149-03

6400
Line Matrix Printer

Coax/Twinax
Multi–Platform Interface Feature
Operation Guide

Note!

Before using the information and the product it works with, ensure that you read the general information under "Notices" on page vi.

February 1998

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Safety Notices

DANGER

Disconnect the AC power cord before cleaning the printer.

WARNING

Before powering on the printer, make sure it is plugged into the appropriate power source.

Refer to the "Select a Site" section in Chapter 2 of the *Setup Guide* for information on proper power sources.

Sikkerhedsinstrukioner

FARE

Tag stikket ud af kontakten inden De gør printeren ren.

FORSIGTIG

Forvis Dem om, at printeren er tilsluttet den korrekte type strøm, inden De tænder for den.

Korrekt strømtype er specificeret i afsnittet Anbringelse af printeren (Select a Site) i Kapitel 2 i Klargøringsvejledning (Setup Guide).

Huomautuksia Turvallisuudesta

VAARA

Irrota vaihtovirtajohto ennen kirjoittimen puhdistusta.

VAROITUS

Ennen virran kytkemistä kirjoittimeen on varmistettava, että kirjoitin on liitetty sopivaan virtalähteeseen.

Asennusoppaan (Setup Guide) luvussa 2, kohdassa Asennuspaikan valinta (Select Site), on tietoja virtalähteen valinnasta.

Normas de Segurança

PERIGO

Desligue o fio de corrente alternada antes de limpar a impressora.

ATENÇÃO

Antes de ligar a impressora, certifique–se que esta está ligada ao tipo de corrente apropriado.

Consulte a secção Escolha de local (Select a Site), do capítulo 2 do Guia de Instalação (Setup Guide), para mais informações sobre os tipos de corrente apropriados para esta impressora.

Säkerhetsföreskrifter

FARA

Koppla los nätkabeln innan du rengör skrivaren.

VARNING

Innan du kopplar på strömmen till skrivaren ska du kontrollera att den är ansluten till rätt strömförsörjning.

I avsnittet Val av uppställningsplats (Select a Site) i kapitel 2 av Installationsanvisningar (Setup Guide) finns information om rätt strömförsörjning.

Sikkerhetsinformasjon

ADVARSEL

Trekk ut strømledningens støpsel fra stikkontakten før skriveren rengjøres.

OBS!

Kontroller at skriveren er tilknyttet riktig strømkilde før du slår den på.

Du finner nærmere opplysninger om egnede strømkilder under avsnittet Valg av egnet sted for skriveren (Select a Site) i kapittel 2 i Installasjonshåndboken (Setup Guide).

About this setup guide

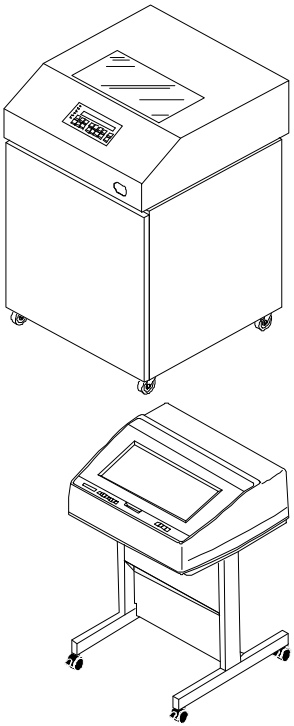
This manual covers the configuration and operation of the Coax/Twinax Multi-Platform Interface (MPI) feature for the IBM 6400 Line Matrix Printers.

The MPI feature enables either coax attachment of the 6400 printer to, for example, a S/370 or S/390 host, or twinax attachment of the printer in an AS/400 or Systems 3X environment.
In addition, the parallel port of the printer is available for attachment to a PC, Network Print Server, or other device attaching through the PC parallel port.

What does the MPI feature do? The MPI acts as a protocol converter, taking coax or twinax data streams and translating them into an ASCII data stream that the 6400 printer parallel ASCII port is set up to handle. As you install and configure the MPI, you are defining the translation that is performed.

The MPI feature will normally already be installed in the printer. If it is not, then follow the hardware installation instructions found in Appendix D.

Once the MPI feature is installed, begin its configuration with the instructions on page 2.



IBM 6400 Printer

Switching between Serial ASCII and Parallel ASCII

To switch between Serial ASCII and Parallel ASCII, the operator must reconfigure the printer interface selection from the operator panel by selecting a custom set that uses the correct ASCII interfaces. This is because the MPI interface communicates through the Parallel ASCII port.

Related Publications

The following are publications referred to in this manual.

Related Publications

Publication Title	Document Number
6400 Line Matrix Printer Setup Guide	S246-0116
6400 Line Matrix Printer Operators Guide	S246-0115
6400 IGP User's Guide	S246-0151
6400 Code V User's Guide	S246-0150

CONFIGURATION

Preparing for Configuration

With the MPI feature installed, the following steps must be performed before it will be fully operational. The MPI feature must be configured, the printer must be configured for correct operation with the feature, and the printer must be defined to the twinax or coax host. In addition, if the parallel port will be used to attach another host, then that configuration must be performed.

Pre-Configuration Checklist

Before configuring the MPI and printer, you should review the following checklist and answer each question. Answering these questions will help you to configure both the MPI and the printer.

- Will you attach the printer to the host with coax or twinax?
- What coax or twinax printer do you want the MPI to emulate?
  Your choices for coax are:
  IBM 3287 and 3262
  Your choices for twinax are:
  IBM 4214, 5225, 5256, and 4234
- Will there be a host device attached through the parallel port? If so, what ASCII emulation will this host device use?
  Your choices are:
  Epson, P-Series, and Serial Matrix
- Is either Code V or IGP graphics feature installed in the printer?

Now that you understand the environment, proceed with the MPI configuration.

Quick Path

These are the basic steps you need to complete to configure the MPI and the printer:

- Set the MPI dip switches (Page 5)
- Set the printer configuration (Page 9)
- If configuring for coax, set the coax buffer size using the rotary switch (see *Using Coax with the MPI*)
- If configuring the MPI for twinax, set the twinax address using the rotary switch (see *Using Twinax with the MPI*)

Configuring MPI

To configure the Multi–Platform Interface Feature, you use the twelve (12) dip switches and the rotary switch located on the Interface I/O (See **Figure 1**).

The MPI is configured differently when connected with twinax or coax cabling. You must know whether you are attaching via twinax or coax.

important

The MPI is set to coax or twinax communications depending upon which cable is attached to the MPI. The default value is Twinax. If the coax BNC adapter cable, part number 08H7968, is attached to the MPI, then coax is the default. If the twinax auto-termination cable, part number 14H5335, is attached to the MPI, twinax is the default. Therefore, if you want to configure the MPI for coax, the coax BNC adapter cable must be attached to the MPI

The dip switches allow you to select the emulation of the printer, character sets, IGP options, etc. If you do not know the type of printer to be emulated, consult your Data Processing department.

The rotary address switch is used to select the coax buffer size or twinax address. For both coax and twinax it is used to select diagnostics.

Table 1 and **Table 2** show the different configurations possible. The selected value is indicated, as shown on the Diagnostic Test 7 Printout, by '=>>'.

To get a printout of the current interface configuration, run Diagnostic 7. See the section starting on page 48 for complete details.

Configure the MPI by putting the dip switches in the position that matches the desired selection.

In the sample printout and the diagnostics, the following convention is used.

0 = OFF or OPEN
1 = ON or CLOSED

note

After making MPI switch or cable changes, the printer must be powered off, wait 15 seconds and then power on the printer in order for those changes to take effect.

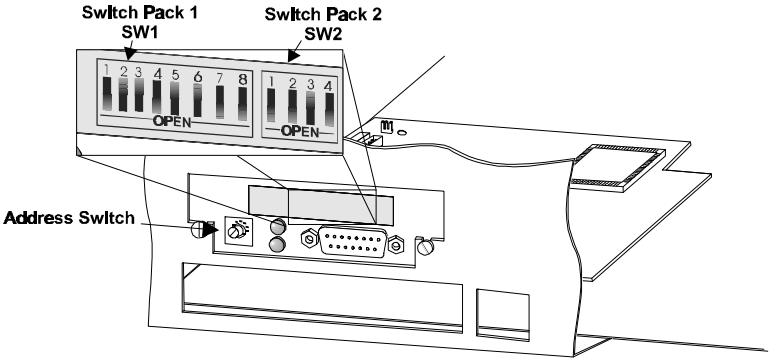


Figure 1 *Location of Configuration Switches.*

Table 1 *Sample Configuration Printout (**Twinax**)*

```
   SW1-2   SW1-1  EMULATION SELECTED
=>>  0       0     4214
     0       1     5225
     1       0     5256
     1       1     4234

   SW1-4   SW1-3  DEFAULT CHARACTER SET
=>>  0       0     MULTINATIONAL
     0       1     USA
     1       0     AUSTRIA/GERMANY
     1       1     FRENCH CANADIAN

   SW1-6   SW1-5  IGP OPTIONS
=>>  0       0     NO IGP INSTALLED
     0       1     IGP-PGL INSTALLED*
     1       0     IGP-VGL INSTALLED**
     1       1     RESERVED

   SW1-7   PRINTER TYPE
=>>  0       6400-PRINTRONIX
     1       6400-EPSON

   SW1-8   PRINTER EMULATION (6400-PRINTRONIX)
=>>  0       P-SERIES COMPATIBLE
     1       SERIAL MATRIX

   SW2-1   DEFAULT IGP SFCC
=>>  0       ^ CARET (5Eh,  94d)
     1       ~ TILDE (7Eh, 126d)

   SW2-3   SW2-2  PANEL AND SYSTEM CONTROL
=>>  0       0    SYSTEM CONTROLS CPI AND PRINT QUALITY
     0       1    SYSTEM CONTROLS CPI, PANEL CONTROLS PRINT QUALITY
     1       0    PANEL CONTROLS CPI, SYSTEM CONTROLS PRINT QUALITY
     1       1    PANEL CONTROLS CPI, PRINT QUALITY, AND LPI

   SW2-4   MULTIPLEXER TIMEOUT
=>>  0       SHORT (15 SEC)
     1       LONG (45 SEC)
```

note

If you are replacing an existing Printronix P-Series printer, SW1-7 and SW1-8 should be set to the Open (Off) state. This will provide compatibility with existing jobs. Also, if you will be port switching, you should set SW1-7 and SW1-8 to be compatible with the alternate host. See page 12 for more information. If you set SW1-7 to 6400 Printronix (Open), you must set SW1-8. If you set SW1-7 to 6400-Epson (Closed), you do not need to set SW1-8 and you can leave SW1-8 to the factory default.

note

** indicates IGP Feature installed.*
*** indicates Code V Feature installed.*

Table 2 *Sample Configuration Printout (**Coax**)*

```
    SW1-1    IBM EMULATION SELECTED
=>>   0      3287
      1      3262

    SW1-2    Character Set Selected
=>>   0      UNITED STATES
      1      UNITED KINGDOM

    SW1-3    DEFAULT MPP
=>>   0      132
      1      NONE

    SW1-4    DEFAULT MPL
=>>   0      NONE
      1      66

    SW1-6   SW1-5      IGP OPTIONS
=>>   0       0        NO IGP INSTALLED
      0       1        IGP-PGL INSTALLED*
      1       0        IGP-VGL INSTALLED**
      1       1        RESERVED

    SW1-7    PRINTER TYPE
=>>   0      6400-PRINTRONIX
      1      6400-EPSON

    SW1-8    PRINTER EMULATION (6400-PRINTRONIX)
=>>   0      P-SERIES COMPATIBLE
      1      SERIAL MATRIX

    SW2-1    DEFAULT IGP SFCC
=>>   0      ^ CARET (5Eh, 94d)
      1      ~ TILDE (7Eh, 126d)

    SW2-2    AUTO FORM FEED
=>>   0      ENABLE AFTER OPERATOR INITIATED LOCAL COPY
      1      DISABLE AFTER OPERATOR INITIATED LOCAL COPY

    SW2-3    PAPER ERROR REPORTING
=>>   0      NEVER REPORT PAPER ERRORS
      1      REPORT PAPER ERRORS

    SW2-4    MULTIPLEXER TIMEOUT
=>>   0      SHORT (15 SECONDS)
      1      LONG (45 SECONDS)
```

note

If you are replacing an existing Printronix P-Series printer, SW1-7 and SW 1-8 should be set to the Open (Off) state. This will provide compatibility with existing jobs.
Also, if you will be port switching, you should set the SW1-7 and SW1-8 to be compatible with the alternate host. See page 12 for more information. If you set SW1-7 to 6400 Printronix (Open), you must set SW1-8. If you set SW1-7 to 6400-Epson (Closed), you do not need to set SW1-8 and you can leave SW1-8 to the factory default.

note

** indicates IGP Feature installed.*
*** indicates Code V Feature installed.*

note

MPP means Maximum Print Position
MPL means Maximum Page Length

Configuring the Printer

In order for the Multi–Platform Interface Feature to operate correctly with the 6400, the printer must be properly configured. The settings of Custom Set 8 provide default values that work correctly with the MPI feature to emulate a P-Series printer. For other MPI ASCII printer emulations, such as an Epson, you will need to change the Custom Set 8 ASCII emulation.

Power-on the printer. If the power-on printer configuration is not set to Custom Set 8, do so now. **Table 3** shows the most important values: shuttle time out, latch data on, and prime signal. If these printer configuration values are set incorrectly, it may cause erratic behavior. For a complete listing of Custom Set 8, see **Appendix B**.

note

For proper printer operation, the ASCII emulation in the 6400 must match the ASCII emulation chosen for the MPI feature. Check that these match and change as needed.

See coax code map on page 22 and twinax code map on page 34 to determine how the coax or twinax host characters are translated to ASCII characters.

note

Consult the printer's Setup Guide for a complete description on how to setup your printer.

Table 3 *Printer Configuration*

PRINTER CONTROL	
SHUTTLE TIMEOUT	**20 SECONDS**
PARALLEL INTERFACE	
INTERFACE TYPE	PC PARALLEL
PC PARALLEL	
DATA BIT 8	ENABLE
DATA POLARITY	STANDARD
STROBE POLARITY	STANDARD
RESPONSE POLARITY	STANDARD
BUSY ON STROBE	ENABLE
LATCH DATA ON	**TRAILING EDGE**
PRIME SIGNAL	**DISABLE**
TOF ACTION AT PRIME SIGNAL .	NO ACTION

note

In ***Table 3*** *, only the values for* Shuttle Timeout*,* Latch Data On*, and* Prime Signal *need to be changed. For all other configuration items, the default values can be used. If the values shown in bold in* ***Table 3*** *are not set as shown, erratic operation of the printer might occur.*

Configuring MPI for Either IGP or Code V Graphic Feature

Those printers using an IGP or Code V Graphics Feature must have the feature installed and the printer properly configured. Check the sample printouts of **Table 2** and **Table 1** to see how to configure the MPI when these two features are being used.

Further changes to Custom Set 8 values for Code V or IGP emulation may have to be made to support your host applications. Refer to the Code V or IGP Programmer's Reference manuals listed in Related Publications on page xii.

Configuring for port switching

If you will be port switching with the MPI, you must set the printer emulation used by the PC application to match the emulation you have set in the printer.

For example, when you have set the printer emulation to 6400-Epson, your host ASCII application, should use a standard Epson print driver.

When you have set the printer emulation to the P-Series emulation, your application should use a standard P-Series printer driver.

Using Coax with the MPI

Coax Connection

To connect the coax line from the cluster controller to the IBM 6400 printer, you must use the supplied BNC Adapter (P/N# 08H7968).

Connect the BNC Adapter to the "HOST" connector port on the Multi–Platform Interface Feature I/O. (See **Figure 2**)

Once you have securely connected the adapter, connect the coax line to the coax connector on the end of the adapter.

Before powering on the printer, it must be defined to the host. For additional information on defining the printer in the S/370 and S/390 environments, refer to Appendix A of this manual.

Power on the printer. At this point, the SYNC LED indicating line activity will be on if there is activity on the coax line. (See page 75 for the location of the SYNC LED)

Send the printer a screen dump from a terminal. If successful, send the printer a print job from the host. In some systems, the printer may not be configured for local screen dumps. When the printer receives a job from the host, the SYS LED will light indicating a job in progress.

important

The printer uses the 3270 data stream format when connected via coax through the MPI. The MPI supports LU0 (DSC), LU1 (SCS) and LU3 (DSE) types only.

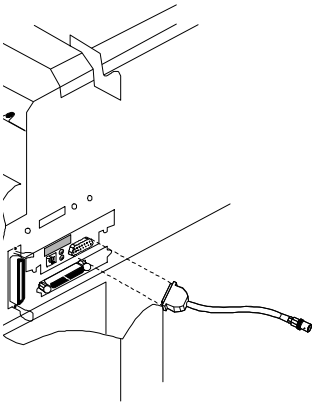


Figure 2 *BNC adapter attachment*

note

Remember! If you make any changes to cables, switch settings or the configuration you must power the printer off, wait 15 seconds and then power the printer on again.

LED Indicators

The Multi-Platform Interface I/O has two LEDs labeled SYNC and SYS (see page 75). These can be used to determine line connection status and host acknowledgment.

When the coax cable is first attached to the BNC Adapter, the SYNC LED will light, showing that active line connection has been made. If the LED fails to light, the line you are connected to may be faulty.

When the interface receives data from the host system, the SYS LED will light indicating a job is in progress.

Coax Buffer Size

While connected to the coax line, the IBM 6400 Multi–Platform Interface Feature has a built in buffer. The size of this buffer is user configured by setting the Address switch (see page 75 for location on I/O) on the MPI I/O to a specified setting. **Table 4** shows the buffer size for each setting.

Table 4 *Buffer Size Selections*

ADDRESS SETTING	Display Screen Size, Print Buffer Size
0	1920 Screen, 2K Buffer
1	1920 Screen, 4K Buffer
2	2560 Screen, 2K Buffer
3	2560 Screen, 4K Buffer
4	3440 Screen, 4K Buffer
5	3564 Screen, 4K Buffer
6	960 Screen, 2K Buffer
7	Sets the interface to Code Dump mode
8	1920 Screen, 4K Buffer
9	1920 Screen, 4K Buffer

note

When using this printer with IBM compatible controllers (e.g. 3174), use the maximum buffer size (Address 5).

Coax Code Dump Mode

The code dump mode allows you to print all

or S/390 system in a hexadecimal format. This can be useful when debugging your

Entering Code Dump mode

To enter the Code Dump mode:

Power off the printer.

2

3 Power on the printer and place it on-

Once the Configuration Printout has printed, the controller will be in Code Dump mode.

In order to use the "Code Dump Mode", the MPI must be receiving data from the host

Exiting Code Dump Mode

To exit Code Dump mode:

1 Power off the printer.

2 Reset the buffer size by setting the ADDRESS switch to the desired address 0-6, or 8-9.

3 Power on the printer and place it on-line.

Coax Command Interpreter

To gain access to some printer features not available on the host system, a Command Interpreter has been built into the Multi–Platform Interface Feature.

By using special control codes, you can pass the hexadecimal codes to the printer that access the ASCII features of the printer. These codes allow you to transparently pass any character or sequence of characters to the printer.

These codes are Hexadecimal ASCII commands and must match ones supported by the printer and MPI ASCII emulation selected.

The commands are initiated by use of the logical not (¬) character. You can access this character by pressing the Shift and 6 keys on your terminal's keyboard.

Commands

The command interpreter is enabled after the **¬ONN** command is received.

The command interpreter is disabled by sending a **¬OFF** command. The default power up state of the command interpreter is disabled.

Table 5 gives an explanation of all the commands available.

Table 5 *Coax Command Interpreter commands*

COMMAND	ACTION
¬ONN	Enable the command interpreter. Ignored if already on.
¬OFF	Disable the command interpreter - Default, power up state. Ignored if already off.
¬HEX	Hexadecimal pass-thru mode. Data following this command is packed into hexadecimal pairs and sent to the printer. The command may be terminated by sending the "@" character. Any non-hexadecimal characters (except the "@") are ignored. Terminate Hex mode by sending an at sign "@".
¬FLS	Forms Length Switch. This command is accepted only in LU3 (DSE) mode. It will set the forms length (in lines) to the value of the three digit number immediately following the command. Top of form will be set to the current physical line. The value must be in the range 000 - 127. There may NOT be any other characters embedded and the forms length MUST be three digits long. Sending the FLS command causes the MPI to load the printers VFU and set the Top Of Form to the present line.
¬L03 or ¬L04 or ¬L06 or ¬L08	Lines Per Inch. This command is accepted in LU3 (DSE) mode only. It will set the line spacing to 3, 4, 6 or 8 lines per inch.

¬ONN - turns on command interpreter.

¬ONN¬HEX 0C 0C 0C @ - send three

¬ONN¬HEX 41 42 43 @ - send ABC in
ASCII to printer.

¬OFF¬HEX 0C 0C 0C @ ¬ONN¬HEX 0C
0C 0C @¬OFF -

printer then feed three sheets of paper.

¬ONN¬FLS058¬OFF

Coax Code Maps

Data sent from the S/370 or S/390 host computer to the Multi–Platform Interface Feature is translated into the correct form for the 6400 printer to understand. The following sections show the maps used by the interface to translate the various kinds of host data into the ASCII printer language.

To translate the coax host character to ASCII character, use the coax hex value as the coordinates (grey column and row) on the map. At that cell, is the ASCII translation (ASCII hex value and character).

For example, a coax DSE hex value of 35 would be translated to ASCII hex 2B and is the ASCII "+" character.

These maps illustrate the translation from host code page United States to ASCII code page PC850. Translation maps for other code pages, such as United Kingdom, are not shown. See Appendix E for Supported Host Character sets.

Translating Host Code Page to ASCII Code Pages

Set the active printer ASCII printer emulation as follows to correctly map host code pages to ASCII code pages:

- Epson Emulation
  ```
  Character Set=0850 PC MULTINATIONAL
  ```
- P-Series Emulation
  ```
  Character set = IBM PC
  Print Language/IBM PC/Select Subset Primary = ASCII (USA)
  Print Language/IBM PC/Select Subset Extended = 0850 PC
      Multilingual
  Alternate Set 80-90F = Printable
  ```
- Serial Matrix Emulation
  ```
  Character set = IBM PC
  Print Language/IBM PC/Select Subset Primary = ASCII (USA)
  Print Language/IBM PC/Select Subset Extended = 0850 PC
      Multilingual
  Alternate Set 80-90F = Printable
  ```

Internal 3270 (DSE/DSC) to ASCII Character Map								
	0	**1**	**2**	**3**	**4**	**5**	**6**	**7**
0	NUL	20	0 30	& 26	nc	nc	nc	nc
1	EM	= 3D	1 31	- 2D	nc	nc	nc	nc
2	FF	' 27	2 32	. 2E	nc	nc	nc	nc
3	NL	" 22	3 33	, 2C	nc	nc	nc	nc
4	nc	/ 2F	4 34	: 3A	nc	nc	nc	nc
5	CR	\ 5C	5 35	+ 2B	nc	nc	nc	nc
6	nc	| 7C	6 36	LN	nc	nc	nc	nc
7	nc	| 7C	7 37	nc	nc	nc	nc	nc
8	> 3E	? 3F	8 38	nc	nc	nc	nc	nc
9	< 3C	! 21	9 39	nc	nc	nc	nc	nc
A	[5B	$ 24	nc	^ 5E	nc	nc	nc	nc
B	] 5D	nc	nc	~ 7E	nc	nc	nc	nc
C	) 29	nc	# 23	nc	nc	nc	nc	nc
D	(28	nc	@ 40	´ 60	nc	nc	nc	nc
E	} 7D	nc	% 25	' 27	nc	nc	nc	nc
F **LSB**	{ 7B	nc	_ 5F	nc	nc	nc	nc	nc

The following control codes are supported:

NUL = NULL EM = END OF MESSAGE

FF = FORM FEED NL = NEW LINE

CR = CARRIAGE RETURN ATT = ATTRIBUTES

Internal 3270 (DSE/DSC) to ASCII Character Map

	8	9	A	B	C	D	E	F	MSB
0	a 61	q 71	A 41	Q 51	ATT	ATT	ATT	ATT	
1	b 62	r 72	B 42	R 52	ATT	ATT	ATT	ATT	
2	c 63	s 73	C 43	S 53	ATT	ATT	ATT	ATT	
3	d 64	t 74	D 44	T 54	ATT	ATT	ATT	ATT	
4	e 65	u 75	E 45	U 55	ATT	ATT	ATT	ATT	
5	f 66	v 76	F 46	V 56	ATT	ATT	ATT	ATT	
6	g 67	w 77	G 47	W 57	ATT	ATT	ATT	ATT	
7	h 68	x 78	H 48	X 58	ATT	ATT	ATT	ATT	
8	i 69	y 79	I 49	Y 59	ATT	ATT	ATT	ATT	
9	j 6A	z 7A	J 4A	Z 5A	ATT	ATT	ATT	ATT	
A	k 6B	nc	K 4B	nc	ATT	ATT	ATT	ATT	
B	l 6C	nc	L 4C	nc	ATT	ATT	ATT	ATT	
C	m 6D	nc	M 4D	nc	ATT	ATT	ATT	ATT	
D	n 6E	nc	N 4E	nc	ATT	ATT	ATT	ATT	
E	o 6A	nc	O 4A	; 3A	ATT	ATT	ATT	ATT	
F LSB	p 70	nc	P 50	* 2E	ATT	ATT	ATT	NUL	

LN = LOGICAL NOT prints as an ASCII caret "^" (5E)

nc = NO CODE AVAILABLE printed as an ASCII space (20th)

EBCDIC (SCS) to ASCII Character Map								
	0	**1**	**2**	**3**	**4**	**5**	**6**	**7**
0	NUL	nf	nf	nf	20	& 26	- 2D	nc
1	nf	nf	nf	nf	nc	nc	/ 2F	nc
2	nf	nf	nf	nf	nc	nc	nc	nc
3	nf	nf	nf	nf	nc	nc	nc	nc
4	VCS	ENP	INP	nf	nc	nc	nc	nc
5	HT	NL	LF	TRN	nc	nc	nc	nc
6	nf	BS	nf	nf	nc	nc	nc	nc
7	nf	nf	nf	nf	nc	nc	nc	nc
8	GE	nf	SA	nf	nc	nc	nc	nc
9	nf	nf	nf	nf	nc	nc	nc	` 60
A	nf	nf	nf	nf	nc	! 21	| 7C	: 3A
B	VT	nf	FMT	nf	. 2E	$ 24	, 2C	# 23
C	FF	nf	nf	nf	< 3C	* 2e	% 25	@ 40
D	CR	nf	nf	nf	(28	) 29	_ 5F	' 27
E	nf	IRS	nf	nf	+ 2B	; 3a	> 3E	= 3D
F LSB	nf	nf	BEL 07	nf	| 7C	LN	? 3F	" 22

LN = LOGICAL NOT prints as "¬" or "^" (ACH or 5EH)
EO = EO control code not supported, prints as a space (20th)
nf = NO FUNCTION supported prints as a space (20th)
nc = NO CODE AVAILABLE printed as an ASCII hyphen (2DH)

EBCDIC (SCS) to ASCII Character Map

	8	9	A	B	C	D	E	F	MSB
0	nc	nc	nc	nc	{ 7B	} 7D	\ 5C	0 30	
1	a 61	j 6A	~ 7E	nc	A 41	J 4A	nc	1 31	
2	b 62	k 6B	s 73	nc	B 42	K 4B	S 53	2 32	
3	c 63	l 6C	t 74	nc	C 43	L 4C	T 54	3 33	
4	d 64	m 6D	u 75	nc	D 44	M 4D	U 55	4 34	
5	e 65	n 6E	v 76	nc	E 45	N 4E	V 56	5 35	
6	f 66	o 6a	w 77	nc	F 46	O 4a	W 57	6 36	
7	g 67	p 70	x 78	nc	G 47	P 50	X 58	7 37	
8	h 68	q 71	y 79	nc	H 48	Q 51	Y 59	8 38	
9	i 69	r 72	z 7A	nc	I 49	R 52	Z 5A	9 39	
A	nc	nc	nc	nc	nc	nc	nc	nc	
B	nc	nc	nc	nc	nc	nc	nc	nc	
C	nc	nc	nc	nc	nc	nc	nc	nc	
D	nc	nc	nc	nc	nc	nc	nc	nc	
E	nc	nc	nc	nc	nc	nc	nc	nc	
F LSB	nc	nc	nc	nc	nc	nc	nc	EO	

The following control codes are supported.

NUL = Null
BS = Back space
FF = Form Feed
ENP = Enable presentation
VCS = Vertical Channel Select
NL = New Line
VT = Vertical Tab
LF = Line Feed
GE = Graphic Escape
HT = Horizontal Tab
TRN = Transparent
CR = Carriage Return
IRS = Interchange Record Separator

The following Format (FMT) control codes are supported in LU1 (SCS):

SHF = "2BC1..."	SET HORIZONTAL FORMAT. (any MPP valid)
SVF = "2BC2..."	SET VERTICAL FORMAT. (any Line Density valid)
SLD = "2BC6..."	SET LINE DENSITY. (00H, 09H, 12H, 18H AND 24H valid "6, 8, 6, 4, and 3 LPI"

Using Twinax with the MPI

Twinax Connection

Before installing the printer into the twinax environment, you should run the built-in diagnostics. See page 48 for instructions on running the diagnostics.

After the Multi–Platform Interface Feature is running the built-in diagnostics you are ready to connect the printer to the AS/400, System 36 or other twinax host system.

Active jobs/devices
If there are any active devices on the twinax line that the printer is going to be on:

1. Terminate the device immediately up cable of the printer, on the twinax line.

2. Place on Hold any devices down cable of the printer with active jobs.

3. SIGN OFF any active terminals and terminal type devices down cable of the printer.

note

"UP CABLE" describes any device that is physically located closer to the Host System on the twinax line. "DOWN CABLE" describes a device physically located more distant from the Host System on the twinax line. For example, if this printer is the third device on the line, the immediate "UP CABLE" device would be the second device on this line.

Power off

The printer's POWER switch should be in the "OFF" position.

"Smart T" attachment

Connect the supplied "Smart T" (twinax auto-termination cable, part number 14H5335) to the 15-pin connector on the printer's MPI interface. (See **Figure 3**)

Termination/cable thru is automatically accomplished by the "Smart T". The "Smart T" has no IN or OUT specific connectors.

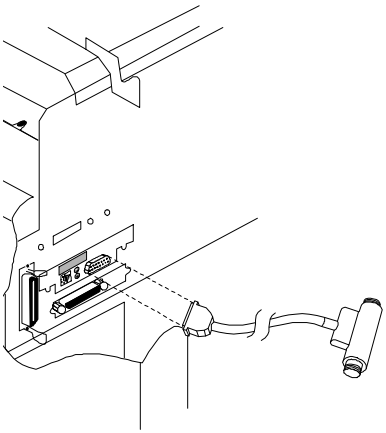


Figure 3 *"Smart T" Attachment*

Attach twinax cables
Attach the twinax cable from the host computer to the "Smart T" connected to the printer earlier.

1 If there is an up cable device connected to the twinax cable (from the host), the twinax cable must originate from the "OUT" connector of that device. The other end of this cable attaches to either side of the "Smart T" connected to the printer.

2 If this printer is the last or only device on the twinax line, the twinax cable attaches to either side of the "Smart T" connected to the printer.

3 If there is a down cable device, connect the other twinax cable to either side of the "Smart T".

Address switch
Before testing, do the following:

1 Verify that the printer address matches the one set up on your host system. The I/O address should be unique on the twinax line. BE CERTAIN THAT NO ADDRESS ON THE LINE IS DUPLICATED!!!

To set the printer address, rotate the address switch, on the I/O, to the number that corresponds to the address setting for your environment. This address should be some number between 0 and 6.

2 Verify that the address matches the one set up on your host system configuration.

Power On Printer

At this point, once the cable connection and the address settings have been verified, you should power on the printer.

LED Indicators

The Multi-Platform Interface I/O has two LEDs labeled SYNC and SYS (see page 75). These can be used to determine line connection status and host acknowledgment.

When the twinax cable is first attached to the Smart T, the SYNC LED will light, showing that active line connection has been made. If the LED fails to light, the line you are connected to may be faulty.

When the interface receives data from the host system, the SYS LED will light indicating a job is in progress.

Printer verification test

Power on the printer.

Access the terminal's SIGN ON SCREEN. If this terminal is a 3180 or 3190, press the "ALT, TEST" keys; otherwise, press the "CMD, BACKSPACE" keys to access the "Prime Option" menu.

From the "Prime Option" menu, run a printer verification test by:

1. Select option "2" on the PRIME OPTION MENU, "Work Station Printer Verification", to run the IBM printer verification test.

2. Select this printer's ID number to run the test on this printer.

3. Select the number of times that you wish to print the WORK STATION VERIFICATION TEST. Possible selections are:
   - **a.** PRINT TEST 1 TIME
   - **b.** PRINT TEST 2 TIMES
   - **c.** PRINT TEST 5 TIMES
   - **d.** PRINT TEST CONTINUOUSLY

4. Select option "C" on the WORK STATION PRINTER VERIFICATION menu, when you have finished printing the test. You will be returned to the "Prime Option Menu".

5. Select option "C" on the PRIME OPTION MENU, "End", to EXIT the "Prime Option Menu".

Should you have any problems while running the Printer Verification test, see *Troubleshooting the Host Printer Operation* on page 52.

Twinax Code Maps

Data sent from the host computer to the Multi–Platform Interface Feature is translated into the correct form for the 6400 printer to understand.

This map illustrate the translation from host code page USA to ASCII code page PC850. Translation maps for other code pages, such as Multinational, are not shown. See *Appendix E* for supported host character sets.

Translating Host Code Page to ASCII Code Pages

Set the active printer ASCII printer emulation as follows to correctly map host code pages to ASCII code pages:

- Epson Emulation

```
Character Set=0850 PC MULTINATIONAL
```

- P-Series Emulation

```
Character set = IBM PC
Print Language/IBM PC/Select Subset Primary = ASCII (USA)
Print Language/IBM PC/Select Subset Extended = 0850 PC
  Multilingual
Alternate Set 80-90F = Printable
```

- Serial Matrix Emulation

```
Character set = IBM PC
Print Language/IBM PC/Select Subset Primary = ASCII (USA)
Print Language/IBM PC/Select Subset Extended = 0850 PC
  Multilingual
Alternate Set 80-90F = Printable
```

EBCDIC (SCS) TO ASCII CHARACTER MAP								
	0	**1**	**2**	**3**	**4**	**5**	**6**	**7**
0	NULL	nf	nf	nf	20	& 26	- 2D	ø 9B
1	nf	nf	nf	nf	nc	é 82	/ 2F	É 90
2	nf	nf	nf	nf	â 83	ê 88	Â B6	Ê D2
3	ATR N	nf	nf	nf	ä 84	ë 89	Ä 8E	Ë D3
4	nf	nf	nf	PP	ä A0	è 8A	À B7	È D4
5	nf	NL	LF	ETR N	à 85	í A1	Á B5	Í D6
6	nf	BS	nf	nf	ã C6	î 8C	Ã C7	Î D7
7	nf	nf	nf	nf	å 86	ï 8B	Å 8F	Ï D8
8	nf	nf	nf	nf	ç 87	ì 8D	Ç 80	Ì DE
9	nf	nf	nf	nf	ñ A4	ß E1	Ñ A5	` 60
A	nf	nf	nf	nf	[5B	] 5D	| 7C	: 3A
B	nf	nf	FMT	nf	. 2E	$ 24	, 2C	# 23
C	FF	nf	nf	nf	< 3C	* 2A	% 25	@ 40
D	CR	nf	nf	nf	(28	) 29	_ 5F	' 27
E	nf	IRS	nf	nf	+ 2B	; 3B	> 3E	= 3D
F LSB	nf	nf	BEL	nf	! 21	^ 5E	? 3F	" 22

EBCDIC (SCS) TO ASCII CHARACTER MAP									
	8	**9**	**A**	**B**	**C**	**D**	**E**	**F**	**MSB**
0	Ø 9D	° F8	µ E6	¢ BD	{ 7B	} 7D	\ 5C	0 30	
1	a 61	j 6A	~ 7E	£ 9C	A 41	J 4A	nc	1 31	
2	b 62	k 6B	s 73	¥ BE	B 42	K 4B	S 53	2 32	
3	c 63	l 6C	t 74	• FA	C 43	L 4C	T 54	3 33	
4	d 64	m 6D	u 75	*f* 9F	D 44	M 4D	U 55	4 34	
5	e 65	n 6E	v 76	§ F5	E 45	N 4E	V 56	5 35	
6	f 66	o 6F	w 77	¶ F4	F 46	O 4F	W 57	6 36	
7	g 67	p 70	x 78	¼ AC	G 47	P 50	X 58	7 37	
8	h 68	q 71	y 79	½ AB	H 48	Q 51	Y 59	8 38	
9	i 69	r 72	z 7A	¾ F3	I 49	R 52	Z 5A	9 39	
A	« AE	ª A6	¡ AD	^ 5E	- F0	¹ FB	² FD	³ FC	
B	» AF	º A7	¿ A8	| B3	ô 93	û 96	Ô E2	Û EA	
C	ð D0	æ 91	Ð D1	¯ EE	ö 94	ü 81	Ö 99	Ü 9A	
D	ý EC	¸ F7	Ý ED	¨ F9	ò 95	ù 97	Ò E3	Ù EB	
E	þ E7	Æ 92	Þ E8	´ EF	ó A2	ú A3	Ó E0	Û E9	
F **LSB**	± F1	¤ CF	® A9	= 3D	õ E4	ÿ 98	Õ E5	– FF	

The following control codes are supported.

NULL = Null
ATRN = ASCII Transparent
FF = Form Feed
CR = Carriage Return
NL = New Line
BS = Back space
IRS = Interchange Record Separator
LF = Line Feed
BEL=Bell Code **(Not sent)**
PP = Print Position Commands
ETRN=EBCDIC Transparency

Code Dump Mode

The code dump mode allows you to print all the data the controller receives from the IBM system in a hexadecimal format.

Entering Code Dump mode

To access the Code Dump mode provided by the controller:

1. Power off the printer.
2. Set the ADDRESS switch to address 7.
3. Power on the printer. After the MPI configuration has printed, set the ADDRESS switch on the interface I/O to the device's current address (0-6) on the host system.

note

In order to use the "Code Dump Mode", the MPI must be receiving data from the host computer.

Exiting Code Dump Mode

To exit Code Dump mode:

1. Power off the printer.

2. Set the ADDRESS switch on the MPI to the device's current address (0-6) on the host system.

3. Power on the printer and place it on-line.

Code Dump Header

The "Code Dump" header is identical to the "Diagnostic" self-test header, except for the test identification in the first line.

Following the header, the received data is printed in a structured field dump format (See **Figure 4**). This shows the data as received from the host system with each SCS command on a separate line. Data is presented in a standard Hex Dump format.

Figure 4 *An example of a Structured Field Dump*

Twinax Command Interpreter

To gain access to some features not available on the AS/400, System 36 or other twinax host system, a Command Interpreter has been built into the Multi–Platform Interface Feature.

By using special control codes, you can pass the ASCII hexadecimal codes to the printer that access the features of the printer. These codes allow you to transparently pass any character or sequence of characters to the printer.

These codes are hexadecimal ASCII commands and must match ones supported by the printer and MPI ASCII emulation selected.

The commands are initiated by use of the logical not (¬) character. You can access this character by pressing the Shift and 6 keys on your terminal's keyboard.

Commands

Preface each of the commands in the following list with a single logical-not character as shown in this document by the "¬" character.

Table 6 Gives an explanation of all the available commands.

Table 6 *Twinax Command Interpreter Commands*

COMMAND	ACTION
¬ONN	Enable the command interpreter. Ignored if already on.
¬OFF	Disable the command interpreter - Default, power up state. Ignored if already off.
¬HEX	Pack valid Hexadecimal characters two to a byte and send to the printer. Invalid Hexadecimal characters will be skipped - all SNA commands will be passed out. Terminate Hex mode by sending an at sign "@".

Example

To send a carriage return, line feed, ABC followed by a form feed you would send the following:

¬ONN¬HEX 0D 0A 41 42 43 0C @
or
¬ONN¬HEX 0D 0A @ABC ¬HEX 0C @

In either case, once the Command Interpreter is enabled, you need not re-enable it until the controller is powered down or following a ¬OFF.

Using PC Parallel with MPI

Introduction

The Multi–Platform Interface Feature has the ability to connect to two different operating systems at once. One of these connections is the twinax or coax connection already discussed.

In addition, the MPI supports the use of a Centronics** "D" connector to connect to systems that support devices attached via a parallel port.

When connected to two host systems, the interface will switch to the other port once the port currently printing is idle for a preset period of time.

When the MPI senses data at one of its input ports, it switches to that input port until the print job is complete. The time between switching from one port to the other after a print job has finished is a user configured parameter. This is defined by the multiplexer timeout (See pages 6 and 7) selections: which are short (15 seconds) or long (45 seconds).

Connection

Before powering on your parallel host system, the printer cable from the system must be plugged into the PC parallel connector on the printer.

Select a time out configuration (either short or long) to match your system's needs.

note

1) *The printer will feed a blank page when data host inputs are switched.*
2) *When switching host inputs, the printer configuration is **not** preserved by the printer's memory. Should any of your PC or network jobs change the printer configuration, it may be necessary for you to reset the printer configuration.*

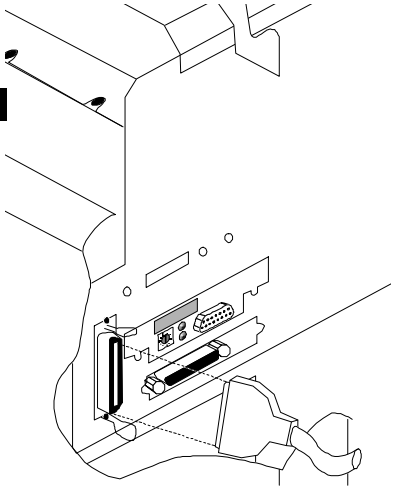


Figure 5 *PC parallel cable attachment*

Setting time outs on the Parallel Host

DOS

If you are using the printer attached to a host PC system using the DOS operating system, use the following configuration for the retry value. The command **MODE LPTn: RETRY=P** (issued from the command prompt, or in a batch file) will set the parallel port timeout to "infinite retry". DOS will continue to try to print a file until it is completed, or removed from the print queue with a **PRINT /T** command.

OS/2

If you are using the interface attached to a host PC system using the OS/2 operating system, the retry value for the parallel port must be set high enough to allow a host print job to complete, plus the multiplexer timeout value. This value is set in the **Parallel Port Setting - LPTn:** screen.

TROUBLESHOOTING

Diagnostics

The Multi–Platform Interface Feature has its own built-in diagnostics programs to help you verify that the printer and the MPI are operating properly.

Diagnostic Header

Each diagnostic test prints a header that displays the firmware part number, revision level, and the controller board option switch settings. For example:

```
IBM 6400 Multi-Platform Interface
ROM=CI-1717 CHECKSUM - 7108 PREDICTED, 7108 ACTUAL
COPYRIGHT 1995
```

note

Wait several seconds after powering on for the selected diagnostic to start.

Coax Operation

Dialing the diagnostic test number into the "ADDRESS" (Address 7) switch selects the diagnostic routine. Powering up the printer executes them. (See **Table 7**)

Table 7 *Coax Diagnostic Tests*

ADDRESS SELECTION	DIAGNOSTIC TEST RESULTS
7	Selects Configuration printout and Code Dump Mode

All other address settings for the coax diagnostic mode are invalid.

note

The Coax adapter must be attached to the MPI I/O for operating the Coax Diagnostics.

Twinax Operation

Dialing the diagnostic test number into the “ADDRESS” switch selects the diagnostic routines. Powering up the printer executes them. (See NOTE).

You may change the "ADDRESS" switch while the diagnostic is running (printing) to step to another diagnostic. (See **Table 8**)

Table 8 *Twinax Diagnostic Tests*

ADDRESS SELECTION	DIAGNOSTIC TEST RESULTS
0-6	Code Dump Mode (if selected after test 7)
7	Configuration Printout
8	Prints one full page in a floating pattern.
9	Continuously sends data to itself (loop back test) and monitors the received data for any errors. Prints "LOOP TEST PASSED" or "LOOP TEST FAILED" at approximately ten second intervals. (SEE CAUTION BEFORE RUNNING DIAGNOSTIC 9.)

caution

*Make sure the host twinax cable **is not** attached to the "Smart T" twinax auto-termination cable, while running diagnostic 9. This will result in system errors and possibly cause a proc-check on your system.*

note

The "Smart T" supplied with the MPI feature must be attached to the MPI for all twinax diagnostics. Remember, it must not be attached to the host System when running diagnostic 9.

Checklist

If the controller's built-in diagnostic tests **do not** perform according to **Table 7** (coax) on page 49 and **Table 8** (twinax) on page 50.

1 Run each diagnostic and save the diagnostic printout.

2 Check all of the installation connections.

3 Verify that the printer's configuration is set according to **Table 3** on page 10.

When diagnostics are complete:

1 Power off the printer and wait 15 seconds

2 Set the address switch back to the original position

3 Power on the printer and resume normal operation

Troubleshooting your Host Printer Operation

If any problems occur while running the Printer Verification Test in either twinax or coax host system check the following:

1 Verify that you have assigned the correct address setting to the printer. (Twinax Only)

2 Verify that the address in the system configuration matches the address setting on the printer. (Twinax Only)

3 Verify that the device type in the system configuration is correct for the type of printer that is being emulated. This emulation is set using the interface configuration switches SW1-1 and SW1-2. Your emulation options for twinax mode are 4214, 4234, 5225 or 5256. In the coax operating mode, 3287 or 3262 are available.

4 Verify that the cable to the device immediately "up cable" on the twinax line is correctly connected. That is, if there is an "up cable" device, does the cable from that device originate at the "OUT" connection. (Twinax Only)

5 Verify that the device immediately "up cable" is functioning properly. (Twinax only)

6 Verify that the device immediately "down cable" is functioning properly. (Twinax Only)

7 Verify that the I/O switch settings on the last device on this line has been set to the "TERM" position. (Twinax Only)

8 Verify that the printer is properly configured (see page 10).

9 Verify that the Multi–Platform Interface's configuration switch settings are correct (See **Table 1** on page 6 (twinax) or See **Table 2** on page 7 (coax)).

10 Put the MPI in coax or twinax code dump mode and print the job in hexadecimal format. Use this printout to verify data from the host.

11 With the MPI not in code dump mode, set the printer configuration to Hex Print Mode and print the job. Use the printout to verify the hexadecimal output of the MPI going to the printer.

12 With no host cable attached, the LEDs will light briefly (about 1 second) when the MPI has completed initialization. If the LEDs do not do this, the MPI's power connection may be faulty.

Compatibility Issues

The following are issues that may arise when implementing the printer in the host environment.

Cancel Key

When the user presses the printer's **CANCEL** key, nothing is reported to the host application. The MPI does not send a message to the host application to cancel the print job.

Coax PA Keys

The MPI does not have coax **PA1** or **PA2** device response capability.

Error Messages

The following tables show error messages as reported to the host system and the causes of those messages. These are the only error messages the MPI reports to the Twinax or Coax host.

Table 9 *Twinax Error Messages*

Error Reported	Cause
Unit Not Available	Printer Offline
Unit Not Available, End of Forms	Paper Error
Exception Status Codes Invalid Activate Invalid Command Overrun Power On Transition	 Twinax Protocol Error Twinax Protocol Error Twinax Protocol Error Power On Transition
Invalid SCS Control Code	Invalid Control Code
Invalid SCS Parameter	Invalid Parameter
Graphic Check	Unprintable character detected after receipt of a “set graphic exception action”

Table 10 *Coax Error Messages*

Error Reported	Cause
Intervention Required	Paper Out (if enabled, after timeout)
Order Reject	Invalid Order Detected
Invalid Parameter	Invalid Parameter in SCS data stream

Switching between Serial ASCII and Parallel ASCII

To switch between Serial ASCII and Parallel ASCII, the operator must reconfigure the printer interface selection from the operator panel by selecting a custom set that used the correct ASCII interfaces. This is because the MPI interface communicates through the Parallel ASCII port.

Appendix A: Defining a Printer in S/370-S/390 Environments

Overview

It is necessary to define a printer in the S/370-S/390 environment to VTAM, JES2, POWER, PSF, VPS, JES328X Print Facility, NCP, VM, VSE, MVS, and/or other software depending upon your operating environment and printing requirements. The following are examples of the type of setups that are required.

6400-LU1-SCS-Local SNA 3174 Control Unit

LU1-SCS mode is utilized when *neither PSF support nor IPDS is required* to accomplish the print function desired. An existing local 3174 SNA-connected control unit is assumed. The steps required to install a local LU1-SCS printer for host definitions are as follows:

1. Define to VTAM by adding logmode entry to VTAM Logmode Table
2. Define to JES2 (not required but recommended. See details below)
3. Define to CICS or another Application Program such as VPS or JES328X products.
4. Select the options on the printer that are appropriate for the environment.

Step 1 – VTAM Definition

The following should be added to the Local Major Node VTAM definition. The printer will be attached as an LU1-SCS capable printer.

```
LOC3174 VBUILD  TYPE=LOCAL
LOCPU74 PU     CUADDR=nnn...
LOC64XX LU     LOCADDR=n,MODETAB=MYMODETB,DLOGMODE=64XXSCSL,
               ISTATUS=ACTIVE
```

The following entry should be placed in the VTAM MODE TABLE specified above or another of your choice.

```
  64XXSCSL MODEENT LOGMODE=64XXSCSL,
                FMPROF=X'03',TSPROF=X'03',PRIPROT=X'B1'
                SECPROT=X'90',COMPROT=X'3080',RUSIZES=X'8787',
                PSERVIC=X'01000000E100000000000000',
                PSNDPAC=X'02',SRCVPAC=X'02',SSNDPAC=X'00'
```

Step2 – JES2 Definition (SYS1.PARMLIB)

```
RMT1    LUTYPE1,BUFSIZE=3840,LINE=1,NUMRD=0,NUMPR=1,NOCOMP,
        NOCMPCT,SETUPHDR,CONSOLE
R1.PR1  CLASS=A,NOSEP,PRWIDTH=132,NOFCBLOD,WS=(W,R,Q,PMD,LIM,
        F,T/C,P),CKTPAGE=30
DESTID  NAME=LOC64XX,DEST=R1
```

Step 3 – Define to CICS or another application program

An application program must provide the SCS commands to control the printer. CICS, VPS, and other applications support SCS as well as numerous application programs, both customer written and vendor supplied.

Refer to the vendor documentation for defining an SCS printer to the program for its use. If there is no specific information on the 64XX you may use the IBM 4234 for reference.

6400-LU1-SCS-Remote SNA 3174 Control Unit

LU1-SCS mode is utilized when *neither IPDS nor PSF* is needed to accomplish the print function desired. An existing remote 3174 SNA-connected control unit is assumed. The steps required to install a remote LU1-SCS printer for host definitions are as follows:

1. Define to NCP, point to LU1 Logmode entry defined below
2. Define to VTAM by adding logmode entry to VTAM Logmode Table
3. Define to JES2 (May not be required if VPS. See details below)
4. Define to JES328X Print Facility, VPS, or equivalent product.
5. Select the options on the printer that are appropriate for the environment.

Step 1 – NCP Definition

```
XYZ    GROUP  TYPE=NCP,...
     LINK  ADDRESS=(032),...
REMPU74  PU   ADDR=C1,...
REM64XX  LU   LOCADDR=#,  (# replaced by port on control
                unit)
         DLOGMOD=64XXSCSR,(Default LOGMODE ENTRY NAME)
         MODETAB=MYTABLE (Table name containing MODEENT)
```

*****

Step 2 – VTAM Definition

***** The following entry should be placed in the VTAM MODE TABLE specified above or another of your choice.

```
64XXSCSR MODEENT LOGMODE=64XXSCSR,
              FMPROF=X'03',TSPROF=X'03',PRIPROT=X'B1'
              SECPROT=X'90',COMPROT=X'3080',RUSIZES=X'87C6',
              PSERVIC=X'01000000E100000000000000',
              PSNDPAC=X'01',SRCVPAC=X'01'
```

Step 3 – JES2 Definition

This definition is not required if you are using VPS and using U1-U9999 as the printer ID.

```
RMT1    LUTYPE1,BUFSIZE=3840,LINE=1,NUMRD=0,NUMPR=1,NOCOMP,
        NOCMPCT,SETUPHDR,CONSOLE (SETUPHDR=PDIR JES2 V3)
R1.PR1  CLASS=A,NOSEP,PRWIDTH=132,NOFCBLOD,WS=(W,R,Q,PMD,LIM,
        F,T/C,P),CKPTPAGE=30
DESTID  NAME=P64XX,DEST=R1
```

Step 4 – Define to CICS or another application program

An application program must provide the SCS commands to control the printer. CICS, VPS, and other applications support SCS as well as numerous application programs, both customer written and vendor supplied. Refer to the vendor documentation for defining an SCS printer to the program for its use. If there is no specific information on the 64XX you may use the IBM 4234 for reference.

6400-LU3-DSE-Local SNA 3174 Control Unit

LU3-DSE mode is utilized when no host printing controls are required to accomplish the print function desired. The printer settings will be used and cannot be overridden by the host system. An existing local 3174 SNA-connected control unit is assumed. The steps required to install an LU3-DSE printer for host definitions are as follows:

1. Define to VTAM by adding logmode entry to VTAM Logmode Table
2. Define to JES2 (Not required but recommended. See details below)
3. Define to CICS or another Application Program such as VPS or JES328X products.
4. Select the options on the printer that are appropriate for the environment.

Step 1 – VTAM Definition

The following should be added to the Local Major Node VTAM definition.

```
LOC3174 VBUILD  TYPE=LOCAL
LOCPU74 PU     CUADDR=nnn...
LOC64XX LU     LOCADDR=n,MODETAB=MYMODETB,
               DLOGMODE=64XXDSEL,ISTATUS=ACTIVE
```

The following entry should be placed in the VTAM MODE TABLE specified above or another of your choice.

```
64XXDSEL MODEENT LOGMODE=64XXDSEL,
              FMPROF=X'03',TSPROF=X'03',PRIPROT=X'B1'
              SECPROT=X'20',COMPROT=X'3080',RUSIZES=X'C7C7,
              PSERVIC=X'038000000000185018507F00',
              PSNDPAC=X'00',SRCVPAC=X'00',SSNDPAC=X'00'
```

Step2 – JES2 Definition (SYS1.PARMLIB)

```
RMT1    LUTYPE3,BUFSIZE=3840,LINE=1,NUMRD=0,NUMPR=1,NOCOMP,
        NOCMPCT,SETUPHDR,CONSOLE
R1.PR1  CLASS=A,NOSEP,PRWIDTH=132,NOFCBLOD,WS=(W,R,Q,PMD,LIM,
        F,T/C,P),CKTPAGE=30
DESTID  NAME=LOC64XX,DEST=R1
```

Step 3 – Define to CICS or another application program

Refer to the vendor documentation for defining a DSE printer to the program for its use. Host system commands to change printer setting are not supported in DSE mode.

Step 4 – Printer Settings

In LU3 mode the printer settings control the CPI, LPI and all other aspects of the printed output. Therefore, you must set the printer settings to match the characteristics of the job you are printing. Host controls are not supported in this mode, except for the coax Command Interpreter commands on page 19.

6400-LU3-DSE-Remote SNA 3174 Control Unit

LU3-DSE mode is utilized when host controls are not needed to accomplish the print function desired. An existing remote 3174 SNA-connected control unit is assumed. The steps required to install a local LU3-DSE printer for host definitions are as follows:

1. Define to NCP point to LU3 default logmode entry defined below
2. Define to VTAM by adding logmode entry to VTAM Logmode Table
3. Define to JES2 (May not be required if VPS. See details below)
4. Define to JES328X Print Facility, VPS, or equivalent product.
5. Select the options on the printer that are appropriate for the environment.

Step 1 – NCP Definition

```
  XYZ    GROUP  TYPE=NCP,...
       LINK  ADDRESS=(032),...
       PU    ADDR=C1,...
  &luname  LU    LOCADDR=#,     (# replaced by port on control
                   unit)
           DLOGMOD=64XXDSER,(Default LOGMODE ENTRY NAME)
           MODETAB=MYTABLE (Table name containing MODEENT)
```

*****

Step 2 – VTAM Definition

***** The following entry should be placed in the VTAM MODE TABLE specified above or another of your choice.

```
  64XXDSER MODEENT LOGMODE=64XXDSER,
                FMPROF=X'03',TSPROF=X'03',PRIPROT=X'B1'
                SECPROT=X'90',COMPROT=X'3080',RUSIZES=X'87C6',
                PSERVIC=X'038000000000185018507F00',
                PSNDPAC=X'01',SRCVPAC=X'01'
```

Step 3 – JES2 Definition

This definition is not required if you are using VPS and using U1-U9999 as the

printer ID.

```
RMT1    LUTYPE3,BUFSIZE=3840,LINE=1,NUMRD=0,NUMPR=1,NOCOMP,
        NOCMPCT,SETUPHDR,CONSOLE (SETUPHDR=PDIR JES2 V3)
R1.PR1  CLASS=A,NOSEP,PRWIDTH=132,NOFCBLOD,WS=(W,R,Q,PMD,LIM,
        F,T/C,P),CKPTPAGE=30
DESTID  NAME=P64XX,DEST=R1
```

Step 4 – Define to CICS or another application program

Refer to the vendor documentation for defining a DSE printer to the program for its use. Host system commands to change printer settings are not supported in DSE mode.

Step 5 – Printer Settings

Since the host controls are not supported, the printer settings for CPI, LPI, and others should be set at the printer. (See User's Guide beginning on page 8-14)

6400-LU0-DSC-Local Non-SNA 3174 Control Unit

LU0-DSC mode is utilized when host controls are not needed to accomplish the print function desired and the control unit is attached by a VTAM-Controlled NON-SNA Control Unit. An existing local 3174 NON-SNA-connected control unit is assumed. The steps required to install a local LU0-DSC printer for host definitions are as follows:

1. Define to VTAM by adding logmode entry to VTAM Logmode Table
2. Define to JES2 (NOT required but recommended. See details below)
3. Define to CICS or another Application Program such as VPS or JES328X products.
4. Select the options on the printer that are appropriate for the environment.

Step 1 – VTAM Definition

The following should be added to the Local Major Node VTAM definition.

```
LOC3174 VBUILD TYPE=LOCAL
LOCPU74 PU    CUADDR=nnn...
LOC64XX LU    LOCADDR=n,MODETAB=MYMODTB,DLOGMODE=64XXDSCL,
              ISTATUS=ACTIVE
```

The following entry should be placed in the VTAM MODE TABLE specified above or another of your choice.

```
  64XXDSCL MODEENT LOGMODE=64XXDSCL,
                FMPROF=X'02',TSPROF=X'02',PRIPROT=X'60'
                SECPROT=X'40',COMPROT=X'0000',RUSIZES=X'C7C7',
                PSERVIC=X'000000000000185018507F00',
                PSNDPAC=X'80',SRCVPAC=X'00',SSNDPAC=X'00'
```

Step2 – JES2 Definition (SYS1.PARMLIB)

```
RMT1    LUTYPE0,BUFSIZE=3840,LINE=1,NUMRD=0,NUMPR=1,NOCOMP,
        NOCMPCT,SETUPHDR,CONSOLE
R1.PR1  CLASS=A,NOSEP,PRWIDTH=132,NOFCBLOD,WS=(W,R,Q,PMD,LIM,
        F,T/C,P),CKPTAGE=30
DESTID  NAME=LOC64XX,DEST=R1
```

Step 3 – Define to CICS or another application program

Host commands for changing printer settings are not supported in this mode. Refer to the vendor documentation for defining an DSC printer to the program for its use.

Step 4 – Printer Settings

In LU0 mode the printer settings control the CPI, LPI and all other aspects of the printed output. Therefore, you must set the printer settings to match the characteristics of the job you are printing. Host controls are not supported in this mode, except for the coax Command Interpreter commands on page 19.

Appendix B: Describing Custom Set 8

Printer Configuration

The following is a listing of the values stored in Custom Set 8. If you are experiencing problems printing jobs, you may need to change values contained in Custom Set 8. Detailed descriptions of the values contained in Custom Set 8 (and all custom sets) are provided in the IBM Line Matrix Printer, 6400 Setup Guide, S246-0116.

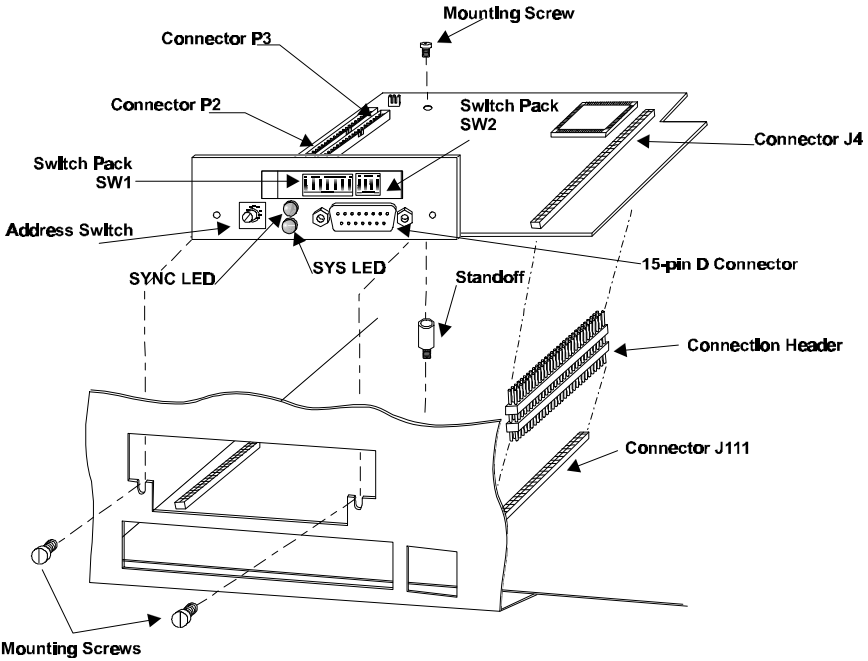
Custom Set 8 (partial)

```
PRINTER CONTROL
  INTERFACE SELECTION             PARALLEL
  DISPLAY LANGUAGE                ENGLISH
  ALARM CONTROL                   ALARM ENABLE
  PRINT DIRECTION                 BIDIRECTIONAL
  HEX PRINT MODE                  DISABLE
  POWER ON STATE                  READY
  PAPER JAM DETECTION             ENABLE
  FORMS SPEED                     NORMAL SPEED
  SET PLATEN AT BOTTOM OF FORM    DISABLE
  SHUTTLE TIMEOUT                 20 SECONDS
  ENERGY SAVER TIMER              15 MINUTES
  OCR FONT DENSITY                120 DOTS PER INCH
  EJECT/RESTORE                   STANDARD
CONFIGURATION MANAGEMENT
  RECALL CUSTOM SET               FACTORY DEFAULT
  SAVE CURRENT VALUES             1
  DELETE CUSTOM SET               1
  CHANGE POWER ON SET             FACTORY DEFAULT
  PROTECT CUSTOM SETS             DISABLE
  PRINT CUSTOM SET VALUES         CUSTOM/PRELOADED SET 8
PARALLEL INTERFACE
  INTERFACE TYPE                  PC PARALLEL
  PC PARALLEL
    DATABIT 8                     ENABLE
    DATA POLARITY                 STANDARD
    STROBE POLARITY               STANDARD
    RESPONSE POLARITY             STANDARD
    BUSY ON STROBE                ENABLE
    LATCH DATA ON                 TRAILING EDGE
    PRIME SIGNAL                  DISABLE
    TOF ACTION AT PRIME SIGNAL    FORM FEED AT RESET
    BUFFER SIZE IN KILOBYTES      1
  DATAPRODUCTS
    DATABIT 8                     ENABLE
    PI IGNORED                    ENABLE
    DATA POLARITY                 STANDARD
    DATA REQUEST POLARITY         STANDARD
    STROBE POLARITY               STANDARD
  SERIAL INTERFACE
    INTERFACE TYPE                RS 232
    DATA PROTOCOL                 XON/XOFF
    BAUD RATE                     9600 BAUD
    DATA BITS                     8
    STOP BITS                     1
    PARITY                        NONE
    DATA TERMINAL READY           READY AND BUFFER NOT FULL
    REQUEST TO SEND               READY AND BUFFER NOT FULL
    BUFFER SIZE IN KILOBYTES      1
    POLL CHARACTER                00 HEX
    ONE CHAR ENQUIRY              DISABLE
EMULATION CONFIGURATION
  ASCII PRINTER EMULATION         P-SERIES EMULATION
  PRINTER EMULATION CONFIGURATIONS
```

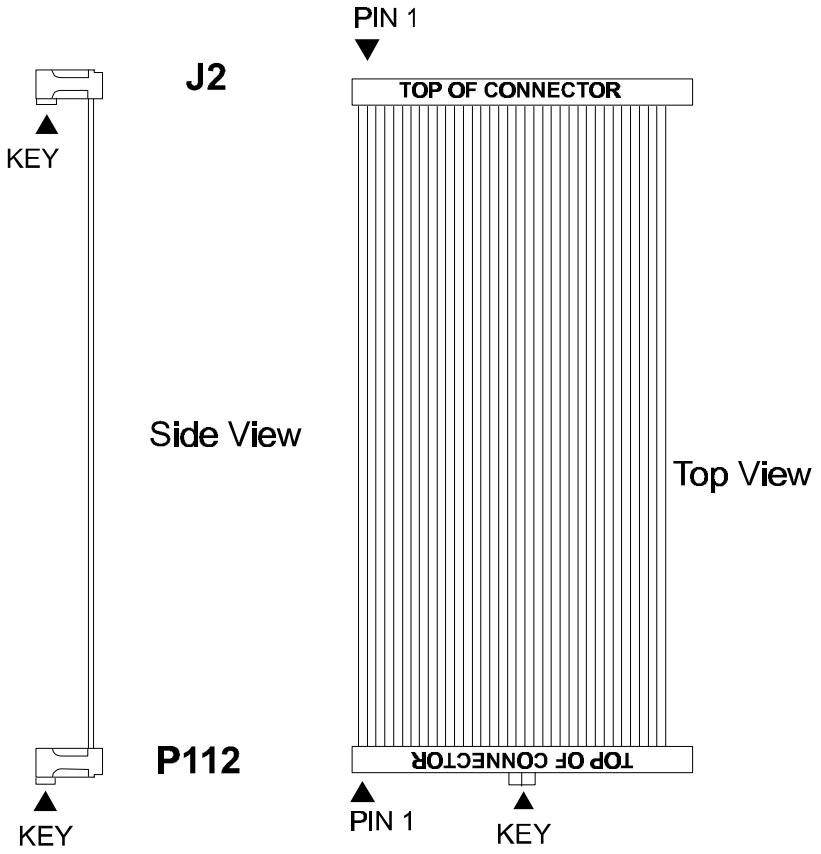
```
  PROPRINTER III XL EMULATION
    PRINT LANGUAGE              0437 PC CHARACTER SET
    ALTERNATE CHARACTER SET     PC CHARACTER SET 1
    DEFINE CR CODE              CR = CR
    AUTO LF                     ENABLE
    DEFINE LF CODE              LF = LF
    FF VALID AT TOF             ENABLE
    20 CPI CONDENSED            ENABLE
  EPSON EMULATION
    CHARACTER SETS              0850 PC MULTILINGUAL
    EPSON PRINT LANGUAGE        ASCII (USA)
    DEFINE CR CODE              CR = CR
    AUTO LF                     DISABLE
    DEFINE LF CODE              LF = LF
    PRINTER SELECT              DISABLE
    20 CPI CONDENSED            ENABLE
  P-SERIES EMULATION
    CHARACTER SETS              IBM PC
    PRINT LANGUAGE
    IBM PC
      SELECT SUBSET PRIMARY     ASCII (USA)
      SELECT SUBSET EXTENDED    0850 PC MULTILINGUAL
    MULTINATIONAL               ASCII (USA)
    ECMA LATIN 1
      SELECT SUBSET PRIMARY     ASCII (USA)
      SELECT SUBSET EXTENDED    MULTINATIONAL
    DEC MULTINATIONAL           ASCII (USA)
    CONTROL CODE 06             8.0 LPI
    CONTROL CODE 08             ELONGATED
    DEFINE CR CODE              CR = CR
    AUTO LF                     DISABLE
    OVERSTRIKE                  ENABLE
    DEFINE LF CODE              LF = CR + LF
    SELECT SFCC                 1
    EVFU SELECT                 ENABLE
    ALTERNATE SET 80-9F         PRINTABLE
  P-SERIES XQ EMULATION
    CONTROL CODE 06             8.0 LPI
    DEFINE CR CODE              CR=CR
    AUTO LF                     DISABLE
    DEFINE LF CODE              LF = CR + LF
    COMPRESSED PRINT            CHAR 01 SOH
    ELONG/ALT. FONT             ELNG =BS FONT =SO
    HIGH SPEED PRINT MODE       CHAR 02 STX
    EVFU SELECT                 ENABLE
    UPPER CASE SELECT           DISABLE
    SLEW RELATIVE               1 TO 16 LINES
  SERIAL MATRIX EMULATION
    CHARACTER SETS              IBM PC
    PRINT LANGUAGE
      IBM PC
        SELECT SUBSET PRIMARY   ASCII (USA)
        SELECT SUBSET EXTENDED  0850 PC MULTI-LINGUAL
      MULTINATIONAL             ASCII (USA)
      ECMA LATIN 1
        SELECT SUBSET PRIMARY   ASCII (USA)
```

```
        SELECT SUBSET EXTENDED   MULTINATIONAL
       DEC MULTINATIONAL         ASCII (USA)
     CONTROL CODE 06             8.0 LPI
     DEFINE CR CODE              CR = CR
     AUTO LF                     DISABLE
     OVERSTRIKE                  ENABLE
     DEFINE LF CODE              LF = LF
     PRINTER SELECT              DISABLE
     ALTERNATE SET 80-9F         PRINTABLE
  PRINT FORMAT
    CHARACTERS PER INCH          10.0 CHARACTERS PER INCH
    LINES PER INCH               6.0 LINES PER INCH
    FORMS WIDTH
      FORMS WIDTH IN INCHES      13.2 INCHES
      FORMS WIDTH IN MM          335.3 MM
      FORMS WIDTH IN CHARACTERS  132 CHARACTERS
    FORMS LENGTH
      FORMS LENGTH IN INCHES     11.0 INCHES
      FORMS LENGTH IN MM         279.4 MM
      FORMS LENGTH IN LINES      66 LINES
    PRINT QUALITY                DP QUALITY
    PRINT CHARACTER TABLE
    PRINT ATTRIBUTES
      PROPORTIONAL SPACING       DISABLE
      ITALIC PRINT               DISABLE
      SLASHED ZERO               DISABLE
    MARGINS
      LEFT MARGIN                0 CHARACTERS
      RIGHT MARGIN               0 CHARACTERS
      BOTTOM MARGIN              0 LINES
    PERFORATION SKIP             DISABLE
    RESET COMMAND                LOAD FACTORY
OPERATOR PRINT TESTS             PRINTER DEMONSTRATION
```

Appendix C: Illustrated Parts List

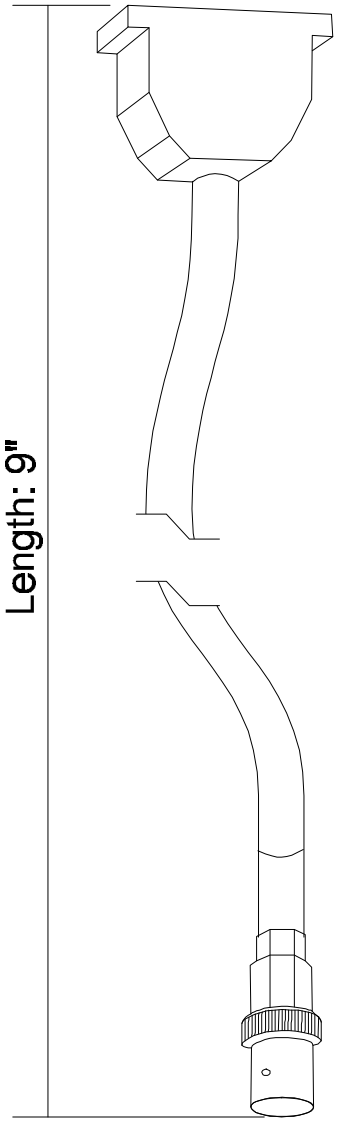


Part No.	Description
14H5593	Hardware, Connector Locations and Interface PCBA (Part number 14H5593 is a Field Replaceble Unit

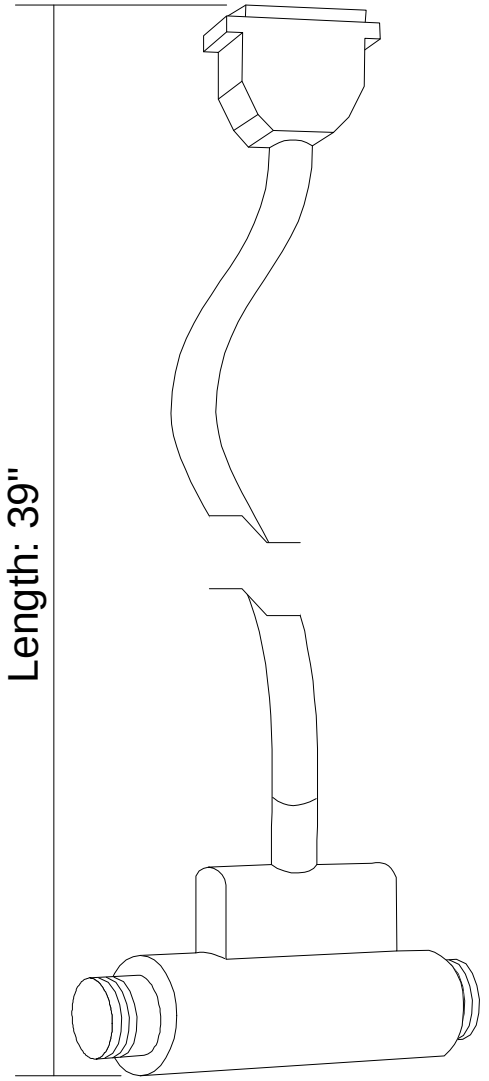


Length: 6.25"

Part No.	Description
14H5592	Cable Assembly, Data Cable



Part No.	Description
08H7968	Cable Assembly, Coax BNC adapter



Part No.	Description
14H5335	Cable Assembly, Twinax Auto-termination

Appendix D: Installing the MPI on the Printer

Introduction

In most cases the MPI Feature will already be installed on the printer. If it is not, contact IBM service to have this feature installed by IBM service personnel. The following instructions are for trained service personnel only.

Before installing the card, print the 6400 configuration and graphics option configuration. Retain these for possible reference.

To complete this installation you will need:

- A standard screwdriver (flat blade)
- A Phillips screwdriver
- ¼ inch wrench
- $^{5}/_{16}$ inch wrench
- An Electro-Static Discharge (ESD) strap

danger

Disconnect the printer from power before proceeding with any installation.

Accessing the card-cage

danger

Disconnect the printer from any and all power before proceeding with any installation.

To access the Card–Cage:

1 Open the Printer Cover. Unload any paper.

2 Loosen the hold-down screws.

3 Lift slightly the right end and slide the Paper Guide Assembly to the left. Lift the paper guide assembly off the card cage. (See **Figure 6**)

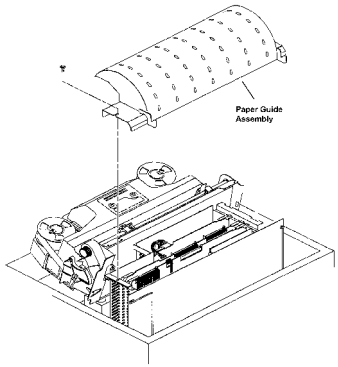


Figure 6 *Paper guide removal*

Put the paper guide assembly to the side for later re-installation.

Preparing the printer for MPI Installation

The next step in installing the Multi-Platform Interface Feature into the printer is to disconnect the PC parallel connector that is currently installed in the printer and open the interface expansion slot

To remove the interface:

1 With the printer's rear cabinet door open, remove the interface expansion slot cover panel. The cover is held down by two screws located at the bottom of the cover; loosen these screws.

warning

Use ESD strap or discharge static electricity before touching the controller board.

2 Disconnect the data cable coming from the Centronics port from connector J112 on the printer's Controller Board.

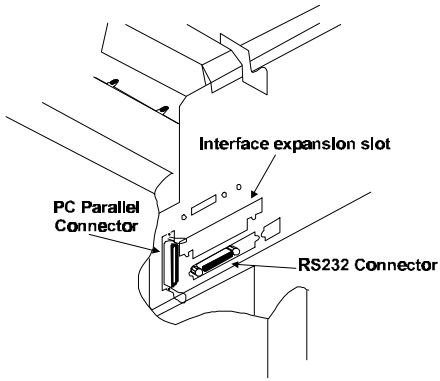


Figure 7 *PC parallel connector and interface expansion slot.*

Installing the MPI Card in the Printer

The next step is to install the MPI card as described below.

danger

Disconnect the printer from power before proceeding with any installation.

1 Install supplied standoff into the mounting hole next to connector J111 on the printer's Controller Board.

2 Connect MPI data cable connector P112 to J112 on the printer's Controller Board. This connector is keyed to prevent incorrect connection. (See **Figure 8**)

3 To supply power to the Multi–Platform Interface, you must connect the interface PCBA to connector J111 of the printer's Controller Board using the supplied 60-pin connection header.

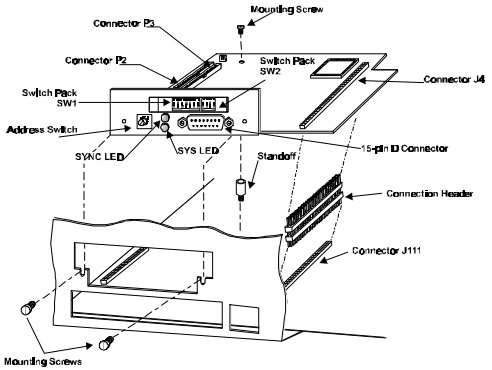


Figure 8 *PCBA Installation*

4 Using two of the supplied Phillips screws, mount the controller I/O assembly in the area formerly occupied by the printer's interface expansion slot cover.

Use the third Phillips screw to mount the Multi-Platform PCBA to the standoff, installed earlier, located on the printer's mother board next to connector J111. (See **Figure 8**)

5 Connect the printer's Centronics data cable to the connector P3 on the Multi-Platform Interface PCBA. This will supply connection to the PC environment.

Make certain that none of the cables are pinched by the installation of the MPI card.

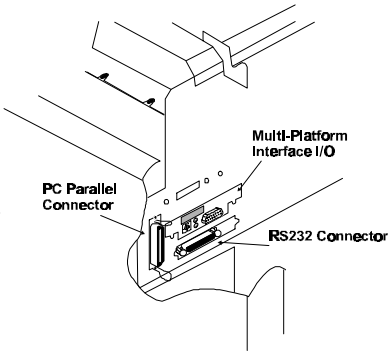


Figure 9 *Printer interface area after installing the Multi-Platform Interface*

Attaching the MPI Label

Attach the MPI Label, part number 145594, on the printer, near the MPI. This label provides information about the MPI connections and is needed, if service is required.

Checking the MPI Installation

Once you have verified that the connectors and boards are securely connected, re-install the Paper Guide Assembly to the card cage.

Reconnect the AC power cord and run the built-in diagnostics as described in the **Troubleshooting** section of this manual.

Appendix E: Host Character Sets

Twinax Character Sets

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

USA EBCDIC Character Set

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

Austria/Germany EBCDIC Character Set

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

French Canadian EBCDIC Character Set

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0						&	-	ø	Ø	°	µ	¢	é	è	¸	0
1						é	/	É	a	j	~	£	A	J		1
2					â	ê	Â	Ê	b	k	s	¥	B	K	S	2
3					ä	ë	Ä	Ë	c	l	t	•	C	L	T	3
4					[	è	À	È	d	m	u	*f*	D	M	U	4
5					à	í	Á	Í	e	n	v	§	E	N	V	5
6					ã	î	Ã	Î	f	o	w	¶	F	O	W	6
7					å	ï	Å	Ï	g	p	x	¼	G	P	X	7
8					ç	ì	Ç	Ì	h	q	y	½	H	Q	Y	8
9					ñ	ß	Ñ	`	i	r	z	¾	I	R	Z	9
A					[	]	|	:	«	ª	¡	^	-	¹	²	³
B					.	$	,	#	»	º	¿	|	ô	û	Ô	Û
C					<	*	%	@	ð	æ	Ð	¯	ö	ü	Ö	Ü
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F					!	^	?	"	±	¤	®	=	õ	ÿ	Õ	–

Coax Character Sets

USA Internal 3270 Character Set																
	0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**A**	**B**	**C**	**D**	**E**	**F**
0			0	&	à	ä	À	Ä	a	q	A	Q				
1		=	1	-	è	ë	È	Ë	b	r	B	R				
2		'	2	.	ì	ï	Ì	Ï	c	s	C	S				
3		"	3	,	ò	ö	Ò	Ö	d	t	D	T				
4		/	4	:	ù	ü	Ù	Ü	e	u	E	U				
5		\	5	+	ã	â	Ã	Â	f	v	F	V				
6		|	6	^	ð	ê	Õ	Ê	g	w	G	W				
7		|	7	¯	ỳ	î	Y	Î	h	x	H	X				
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9	<	!	9		é	û	E	Û	j	z	J	Z				
A	[	$	ß	ˆ	è	á	E	Á	k	æ	K	Æ				
B	]	¢	§	~	í	é	I	É	l	ø	L	Ø				
C	)	£	#	¨	ó	í	O	Í	m	å	M	Å				
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E	}	¤	%	'	ü	ú	Y	Ú	o	;	O	;				
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USA EBCDIC Character Set

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0						&	-						{	}	\	0
1							/		a	j	~		A	J		1
2									b	k	s		B	K	S	2
3									c	l	t		C	L	T	3
4									d	m	u		D	M	U	4
5									e	n	v		E	N	V	5
6									f	o	w		F	O	W	6
7									g	p	x		G	P	X	7
8									h	q	y		H	Q	Y	8
9								`	i	r	z		I	R	Z	9
A					¢	!	|	:							
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C					<	*	%	@								
D					(	)	_	'								
E					+	;	>	=								
F					|	^	?	"								

UK Internal 3270 Character Set

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

UK EBCDIC Character Set

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0						&	-						{	}	\	0
1							/		a	j	~		A	J		1
2									b	k	s		B	K	S	2
3									c	l	t		C	L	T	3
4									d	m	u		D	M	U	4
5									e	n	v		E	N	V	5
6									f	o	w		F	O	W	6
7									g	p	x		G	P	X	7
8									h	q	y		H	Q	Y	8
9								`	i	r	z		I	R	Z	9
A					$	!	|	:							
B					.	£	,	#								
C					<	*	%	@								
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E					+	;	>	=								
F					|	^	?	"								