North American Response Centers

HP 3000 APPLICATION NOTE #3

HP 3000

Plotter Configuration
Guide

PLOTTER CONFIGURATION

This guide is intended to be a quick reference for plotter configuration problems. General information on 3000s, terminals and plotters appears first, followed by information on individual plotters, grouped by families.

GENERAL INFORMATION

There are three ways to hook up a plotter. You can:

- attach it to a separate port on the 3000,

- attach the plotter and a terminal to the same 3000 port (called "eavesdropped"),

- attach the plotter to the back of your terminal via an HP-IB cable (called "slaved").

Some plotters, like the 7550 and the 758X models, come with both RS232 and HP-IB interfaces, so there is a choice in how to connect them. When debugging problems with a plotter, it is important to note the method of attachment.

Separate Port Attachment

This is a very common method of attaching plotters to a 3000, and provides convenient access by a number of different users without having to re-cable equipment.

SEPARATE PORT CONFIGURATION. The configuration for the 3000 port is the same for all plotters, and varies only with the revision of MPE. Port speed must match that of the plotter. Configure the port for the linespeed of the plotter to be used. Plotter linespeeds are discussed in the section on individual plotter characteristics.

To determine the configuration for a port, use the following guidelines:

For plotters connected to ATP ports:

Type 16, Sub-type 0, Term-type 9, Record Width 40, Mode JAID, Driver HIOTERM1

For plotters connected to ADCC ports:

--MPE V/E and later:

Type 16, Sub-type 0, Term-type 9, Rec Width 40, Mode JAID, Driver HIOTERM2

--MPE V/P-delta-1 and earlier, including MPE IV:

Type 16, Sub-type 4, Term-type 10, Rec Width 40, Mode JAID, Driver HIOTERM0

For plotters connected to ATC (Series II/III only) ports:

Type 16, Sub-type 4, Term-type 10, Rec Width 40, Mode JAID, Driver IOTERM0

CABLING. Plotters require only pins 2,3 and 7, all straight through. Use a 13242N, 13242Y, 17255D, or 17355A for a 25-pin port or a 13242X for a 3-pin ATP port, or equivalent cable. For troubleshooting purposes, HP may require that the plotter be attached via the appropriate HP supplied cable

LIMITATIONS AND CONSIDERATIONS. With current HP 3000 Business Graphics software such as DSG and HPDRAW, plotter spooling is NOT supported. The system spooler interferes with the status checking mechanism of the software, so the device must run "hot".

Attachment of a plotter via a multiplexer, data switch or other data communications equipment is NOT supported. In many cases however, plotters will work when hooked up in this manner. Additionally, there may be software patches available that permit certain plotters to operate via a data switch or other equipment; contact the Response Center for additional information. Availability of a software patch however does not make the configuration a supported one.

Eavesdropping the Plotter with a Terminal

This is a common method of attaching a plotter and a terminal to the same port when the terminal does not have an HP-IB interface.

PORT CONFIGURATION. Port configuration for eavesdropped plotters is simple; you don't have any choice. Configure the port for the type of terminal in use with the plotter.

LIMITATIONS AND CONSIDERATIONS. Some plotters must be turned on when using the terminal, even if you don't plan to use the plotter. Refer to the section on individual plotters for details.

HP-supplied HP 3000 Graphics software does not support plotters attached to an unused RS-232 port on a terminal. The plotter must be between the terminal and the computer or modem. Not only is attaching a plotter to a secondary RS-232 port on a terminal unsupported, it just plain doesn't work.

Terminal speed, port speed, and plotter speed must match in order to plot. For example, if terminal speed is 9600 bps and the maximum speed of the plotter is 2400 bps, you must use the MPE :SPEED command to change port speed to 240 before plotting, or log on with the terminal set to 2400 bps. Type "HELP SPEED" at the MPE colon prompt for help with the speed command. Speed should not be a problem if the plotter is turned off.

It is possible to use HP Graphics software on one terminal and output to an eavesdrop plotter which is connected to another terminal. However, when you do this, the terminal with the eavesdrop plotter connected cannot be logged on to the HP 3000.

Slaved (HP-IB) Attachment

The easiest way to hook up a plotter is to connect it to a terminal via HP-IB. With HP-IB, you don't have to worry about baud rate or cabling, and the plotter never has to be turned on in order for the terminal to work. This requires an HP-IB verison of a plotter and an HP-IB interface on the terminal.

Business Graphics on the 3000 default to HP-IB address 5, so that is usually the address at which users operate their plotters. Plotters are shipped from the factory with the address already set to 5. The graphics software will work with different HP-IB addresses, but you'll have to specify this address when you plot. EZCHART only supports plotting on HP-IB address 5.

HP-IB addresses on plotters are set like addresses on other HP-IB devices, such as disc drives. Each switch has a binary value of 16, 8, 4, 2, or 1. To calculate the address, add up the total of all the switches in the '1' position, and omit the values of the switches in the '0' position. For instance, to set an address of 7, you would put the "1", "2" and "4" switches in the '1' position, and all the other HP-IB switches in the '0' position. When changing an HP-IB address, turn off the plotter, reset the switches, then turn the plotter power back on. This will ensure the new address gets set properly. We find that a sharp pencil point works very well for changing switches.

722X Series

These are flat bed, fixed paper models. They can be connected to a separate port or eavesdropped, but are not found in HP-IB models. This family has a maximum speed of 2400 baud and is no longer in production.

The A/B/S models have 4 pens and the C/T versions have 8 pens. The T model is scrollable, the C is not.

722X A/B/S SWITCH SETTINGS. Set the switches as shown in the diagram below. Adjust the baud rate to terminal and port speeds.

722X C/T SWITCH SETTINGS. Set the switches as shown in the diagram below. Adjust the baud rate to terminal and port speeds.

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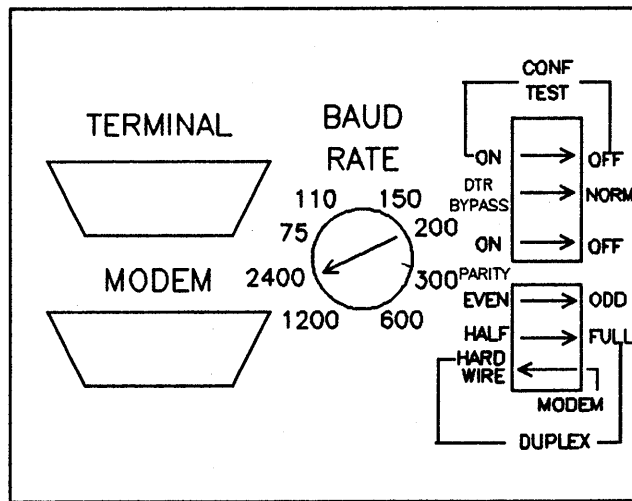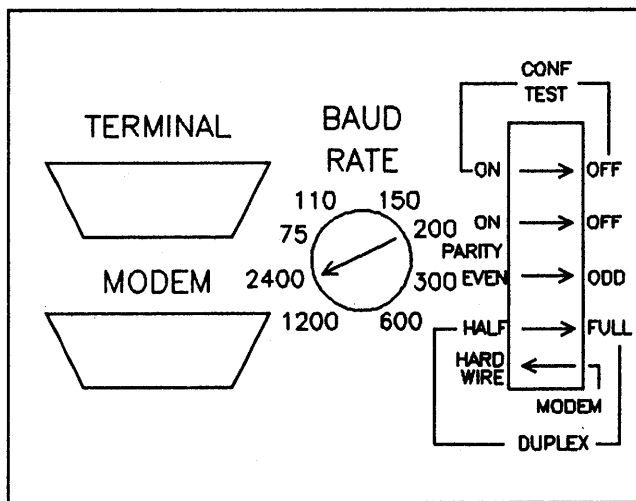
7440A

The 7440A ColorPro Plotter is the low cost 8 pen plotter. It handles A and A4 size paper like the 7470A. This plotter is not currently supported on the HP 3000, but may work under certain conditions.

The 7470A comes in two options, RS-232 (Option 1) and HPIB (Option 2). The RS-232 version can only be attached to a separate port. This plotter will not work in eavesdrop mode. In addition, the RS-232 version needs a Graphics Enhancement Cartridge (17440A) to work with HPDRAW and DSG. EZCHART and HPMAP do not currently work with Option 1 of the ColorPro. See the following matrix for a list of what works:

	HP–IB		RS–232* separate port	
	w/o 17440A	w/ 17440A	w/o 17440A	w/ 17440A
HPDRAW	OK	OK	NO	OK
DSG/3000	OK	OK	NO	OK
HPEasyChart	OK	OK	NO	NO
HP Map	OK	OK	NO	NO

*Note that the 7440A does not support eavesdrop connection, therefore, none of the graphics products will work in eavesdrop mode.

In order to plot to the ColorPro, specify 7440A as the device model number on the plotting menu.

SETTING 7440A OPTION 1 BAUD RATE, PARITY AND OTHER SWITCHES. To set the switches of a 7440A RS-232 plotter, turn it off, set the DIP switches according to the tables below, then turn the power back on. The configuration is now set. The baud rate table assumes one stop bit. If you are using two stop bits, see the reference manual for switch settings.
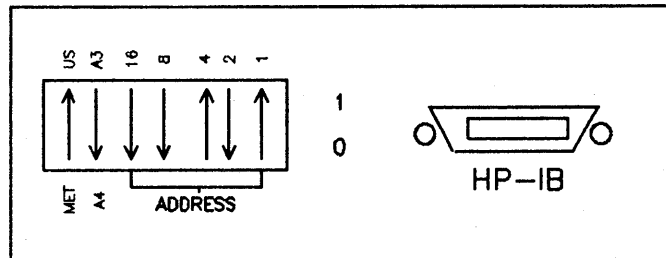
7440A Baud Rate Table

	Switch Settings			
Rate	B4	B3	B2	B1
300	0	1	0	1
1200	0	1	1	1
2400	1	0	0	0
4800	1	0	0	1
9600	1	0	1	0

The remaining switches should be set as shown in the following diagram.
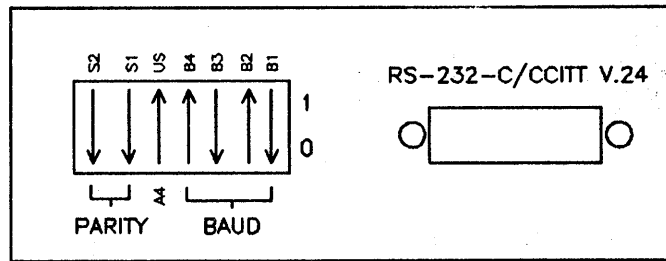
OPTION 2 SWITCH SETTINGS.

7440A SELF TEST. The ColorPro can perform a test plot. If the plotter fails to talk to the computer, perform the self test to see if the plotter itself is operating correctly. Turn on the plotter and load the paper. Hold down the "." key and press the white paper load key. If nothing happens, there is a hardware problem with the plotter.

747X Series

The 747X family of moving paper plotters comes in three flavors, RS-232 (Option 001), HP-IB (Option 002) and HP-IL (Option 003, 7470A only). Option 1 models can operate at 9600 baud and can be separate ported or eavesdropped. Option 2 models can only be slaved. Option 3 7470As are intended for use only with microcomputers with the HP-IL interface installed, and are not supported by 3000 Business Graphics.

The 7470A is a two pen plotter, and handles A (8.5 X 11 in.) size paper and A4 (210 X 297 mm) size paper.

The 7475A is a six pen model, and handles A and A4, plus B (11 X 17 in.) and A3 (297 X 420 mm) size paper.

SETTING 747X OPTION 1 BAUD RATE, PARITY AND OTHER SWITCHES. To set the switches of a 747X RS-232 plotter, turn it off, set the DIP switches according to the tables below, then turn the power back on. The configuration is now set. The baud rate table assumes one stop bit. If you are using two stop bits, see the reference manual for switch settings.

747X Baud Rate Table

	Switch Settings			
Rate	B4	B3	B2	B1
300	0	1	0	1
1200	0	1	1	1
2400	1	0	0	0
4800	1	0	0	1
9600	1	0	1	0

The remaining switches should be set as shown in the diagram of each plotter, shown below.
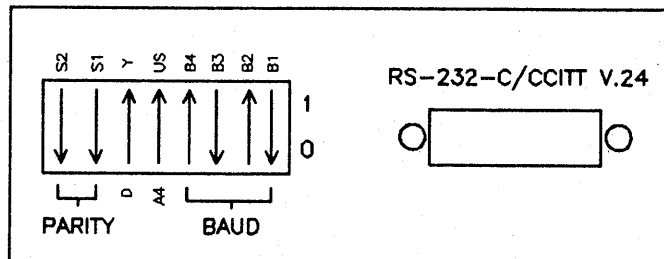
7470A Switches (eavesdrop)
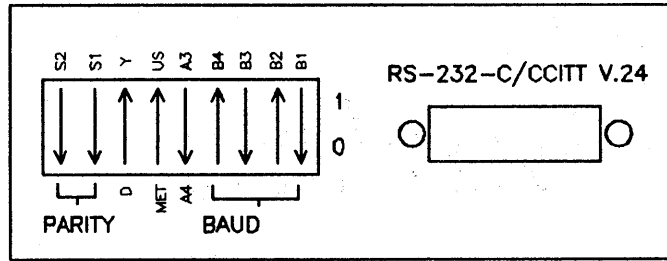
7475A Switches (eavesdrop)

**EAVESDROPPING 747X PLOTTERS.** When connected in eavesdrop mode, the plotter must be powered on in order for the terminal to work.

Eavesdropping a 747X Option 1 requires a special cable, 17455A, (part number 07470-60090). This cable is Option 16, often referred to as a "Y" cable.

The cable does not really resemble a "Y", but is called a "Y" for the way it connects to the other cables. The base (male end) of the Y connects to the plotter, one end of the top of the Y connects to the cable running to the terminal, and remaining connector attaches to the cable running to the 3000 port.

The following diagram illustrates an eavesdropped 747X using a "Y" cable:
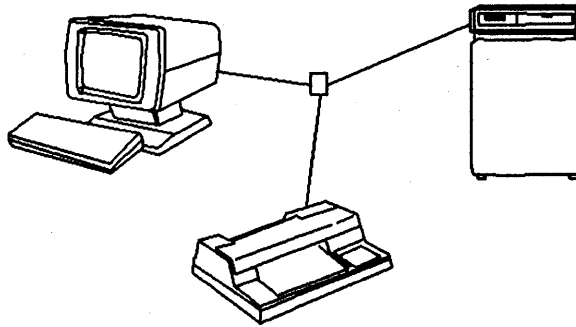
OPTION 002 SWITCH SETTINGS. For normal operation in the US, set the switches as shown in the following diagram. Switch settings are the same for the 7470 and 7475.
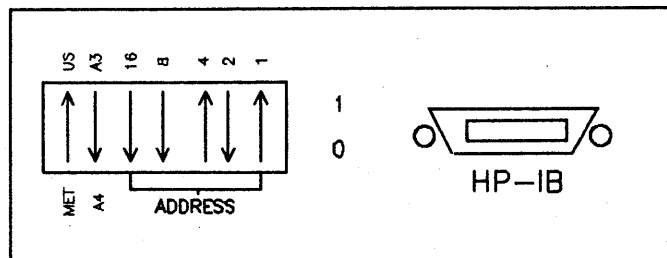
747X Switches (HP-IB)

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7475A SELF TEST. The 7475A plotter can perform a test plot. If the plotter fails to talk to the computer at all, perform the self test to see if it is completely dead. To perform the self test, load the pen carousel, hold down the P1 and P2 keys, and power on the plotter. When the carousel turns and you hear a slight "tapping" noise, release P1 and P2. If nothing happens or the plot is in error, there is a hardware problem with the plotter.

7550A

The 7550A is a high-speed 8-pen plotter, which can plot on A (8.5 x 11), B (11 x 17), A3 (297 x 420 mm), or A4 (210 x 297 mm) size paper. It has an automatic sheet feeder that can load paper before each plot. The 7550A comes with both RS-232 and HP-IB interfaces, so you can hook it up any of the three ways described below.

Configuration of the 7550 is done through the front panel soft keys. There are no DIP switches to set. All configurations changes should begin with powering off the plotter.

Some software patches may be available for this plotter. If you are experiencing plotting problems, contact the Response Center for more information.

7550 configuration will be retained when you turn off plotter power. To reset the configuration to factory default, hold down the FAST key while turning on the plotter.

SEPARATE PORT CONNECTION OF THE 7550A. Cabling for this type of connection is fairly simple, the only thing to remember is that the connector on the plotter for the computer cable is male instead of female. This means you will need a gender changer cable (part no. 92222F) if you plan to use a standard 13242N male-male cable.

To configure the plotter, follow these steps:

1. Hold down the FAST key and turn on the power. The power switch is on the back, on the lower left corner as you face the front of the plotter. Wait for the pen carousel and plotter arm to stop moving. The plotter is now set to factory defaults.

2. Hold down the ENTER key and press NEXT DISPLAY.

3. Press the SERIAL softkey.

4. Press the DATA FLOW softkey.

5. Press the EAVESDROP softkey; it should now display STANDALONE.

6. Press ENTER.   *6.5 Press Next display*

7. Press the BAUD softkey.

8. Press the 2400 softkey a few times until you reach the baud rate of the port to which you are connecting the plotter.

9. Press ENTER.

This completes separate port configuration.

EAVESDROP CONNECTION OF THE 7550A. Connect the plotter to the computer as described in the standalone section. The plotter connector for the plotter/terminal cable is female, so you'll need a male-male cable with the pins wired straight through. A 13242N cable can be used here, although you don't need all the pins.

To configure the plotter, follow these steps:

1. Hold down the FAST key and turn on the power. The power switch is on the back, on the lower left corner as you face the front of the plotter. Wait for the pen carousel and plotter arm to stop moving. The plotter is now set to factory defaults.

2. Hold down the ENTER key and press NEXT DISPLAY.

3. Press the SERIAL softkey.

4. Press the DATA FLOW softkey.

5. Press ENTER.
   5.5 ↑ Next display
6. Press the BAUD softkey.

7. Press the 2400 softkey a few times until you reach the baud rate of the port to which you are connecting the plotter.

8. Press ENTER.

This completes eavesdropped configuration.

SLAVED (HP-IB) CONNECTION OF THE 7550A. Configuration of the 7550A in this case is simple if you want to use the recommended HP-IB address 5. Just hold down the FAST key and power up the plotter.

To use an HP-IB address other than 5, complete the following steps:

1. Hold down the FAST key and turn on the power. The power switch is on the back, on the lower left corner as you face the front of the plotter. Wait for the pen carousel and plotter arm to stop moving. The plotter is now set to factory defaults.

2. Hold down the ENTER key and press NEXT DISPLAY.

3. Press the HP-IB softkey.

4. Set the HP-IB address. The softkey to the left of the NEXT DISPLAY key increases the address number, the softkey to the right of the LOAD/UNLOAD key decreases the address number.

5. Press ENTER.

7550A SELF TEST. The 7550A plotter can perform a test plot. If the plotter fails to talk to the computer at all, perform the self test to see if it is completely dead. To perform the self test, load the pen carousel and paper, power on the plotter, press the NEXT DISPLAY key twice, then press the DEMO softkey. The plotter should now be producing a demo plot. If nothing happens or the plot is in error, there is a hardware problem with the plotter.

758X Series

Most 758X drafting plotters come with both RS-232 and HP-IB interfaces, so you have a choice in connecting them. Floor space is usually the limitation here, as these plotters do not fit neatly on a desk.

7580A/7585A. These two models do not come with both RS-232 and HP-IB interfaces. The interface on the plotters depends on which option is ordered; Option 001 is the RS-232 model and Option 002 is the HP-IB model.

Option 001 plotters cannot be eavesdropped. They must be attached to a separate port. Set the switches according to the diagram below.

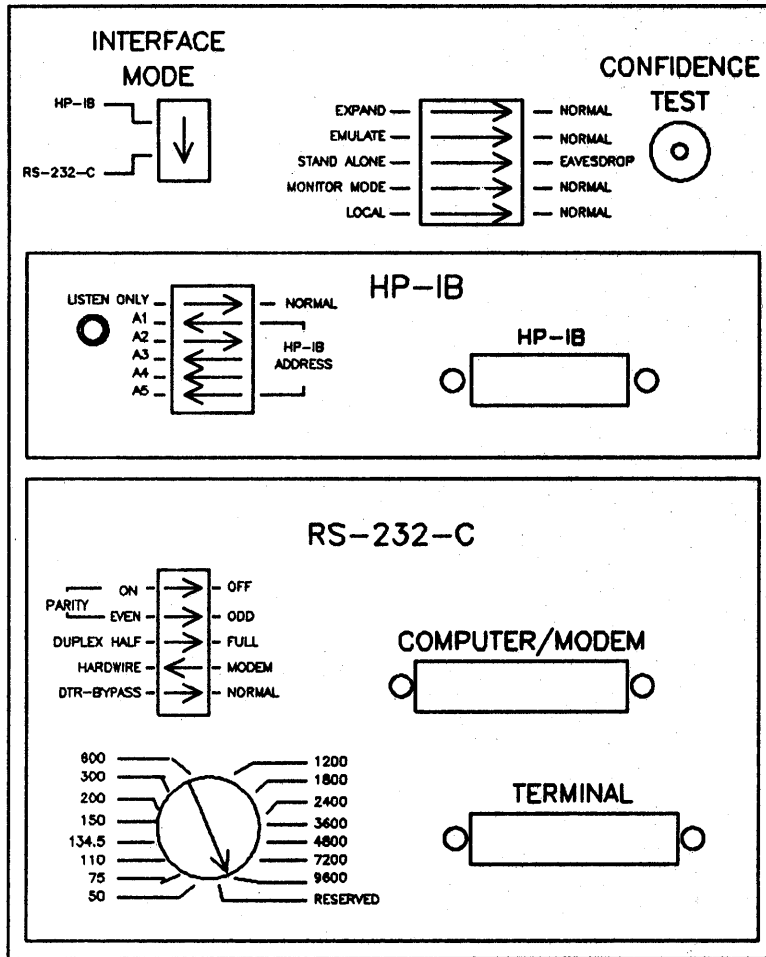Option 002 plotters should be set as shown in the diagram below.
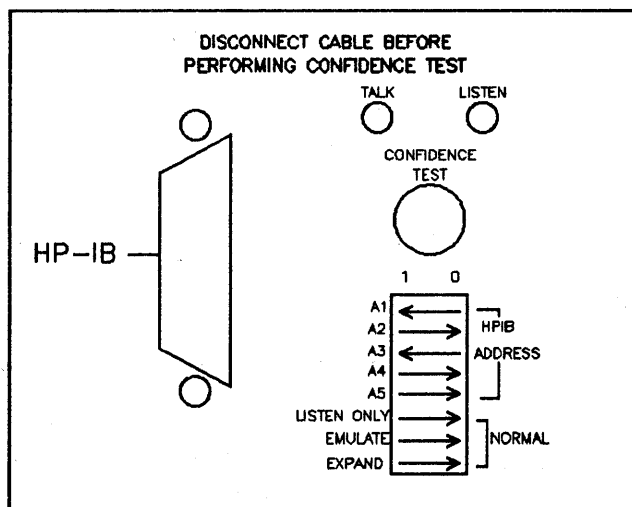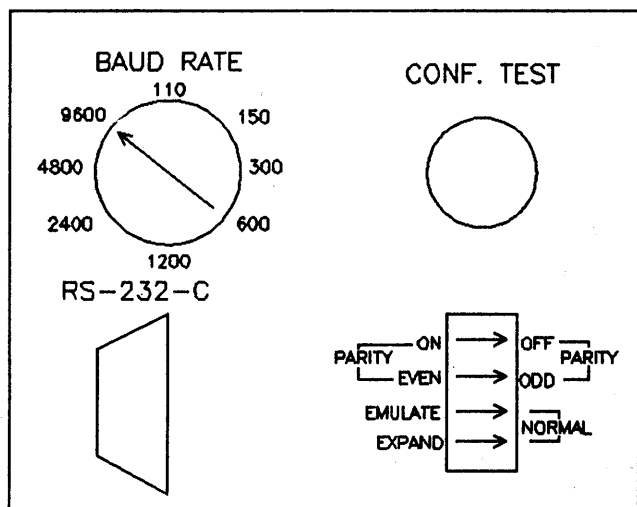
7580B/7585B/7586B PLOTTERS. These models are the later versions of the A models, and come with both RS-232 and HP-IB interfaces. In addition, they can all be connected in eavesdrop mode. All B models use the same switch settings.

To connect a 758XB in standalone mode, set the switches as shown in this diagram.
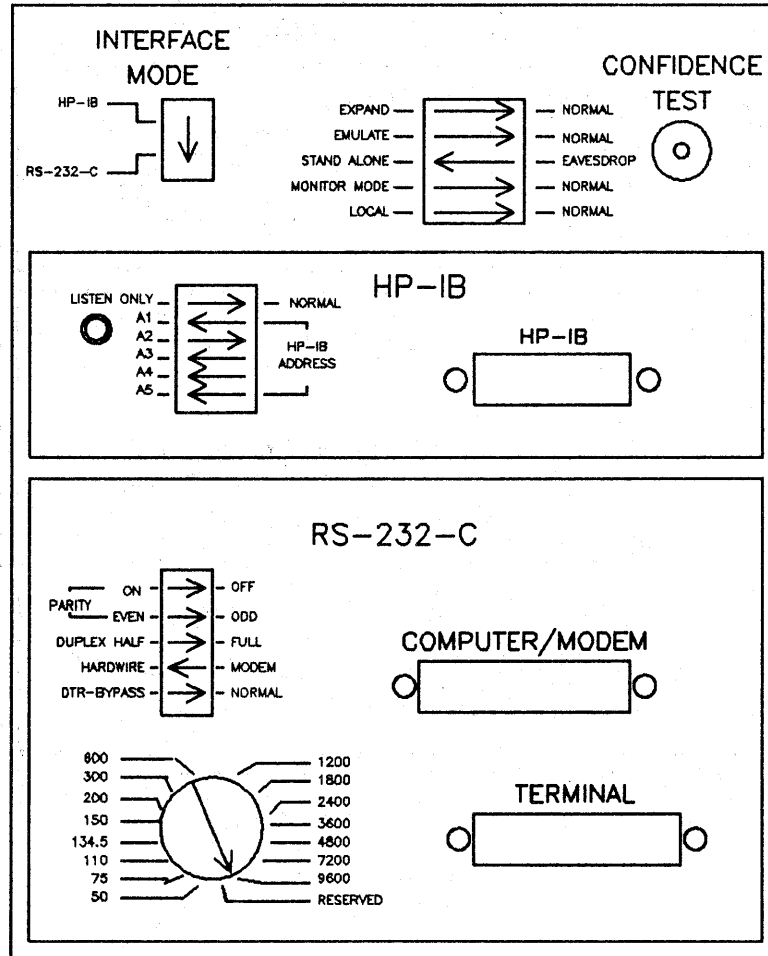

7585B Switches (standalone)

To connect a 758XB in eavesdrop mode, set the switches as shown in this diagram.

INTERFACE MODE

HP-IB

RS-232-C

EXPAND — → — NORMAL
EMULATE — → — NORMAL
STAND ALONE — → — EAVESDROP
MONITOR MODE — → — NORMAL
LOCAL — → — NORMAL

CONFIDENCE TEST

HP-IB

LISTEN ONLY — → — NORMAL
A1
A2
A3   HP-IB
A4   ADDRESS
A5

HP-IB

RS-232-C

PARITY
ON — → — OFF
EVEN — → — ODD
DUPLEX HALF — → — FULL
HARDWIRE — ← — MODEM
DTR-BYPASS — → — NORMAL

COMPUTER/MODEM

600 — 1200
300 — 1800
200 — 2400
150 — 3600
134.5 — 4800
110 — 7200
75 — 9600
50 — RESERVED

TERMINAL

7585B Switches (eavesdrop)

To connect a 758XB via an HP-IB cable, set the switches as shown in this diagram.
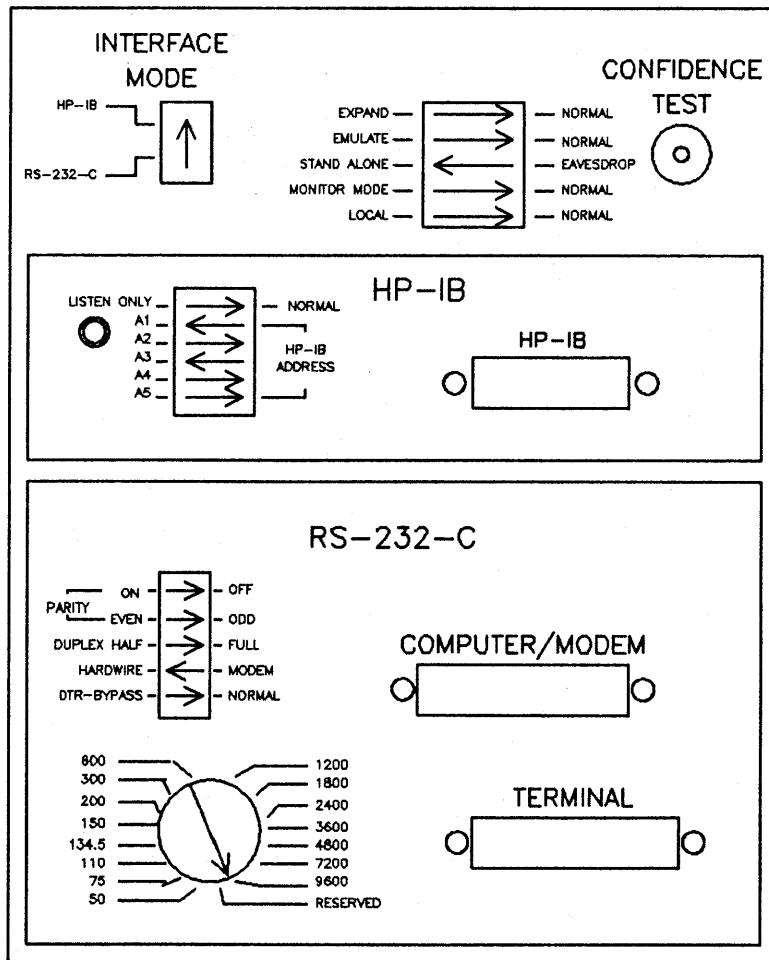
7585B Switches (HP-IB)

9872 Series

These plotters are essentially the 722X models with HP-IB interfaces instead of RS-232 interfaces. Like the 722X models, they are out of production.

The S model is scrollable while the A and B models are not. The A model is supported until 11/86 while the B and S models are supported until 2/88. The T model is scrollable, the C model is not.

9872A/B/S SWITCH SETTINGS. For proper operation, the plotter switches should be set as shown in the diagram below.

9872C/T SWITCH SETTINGS. For proper operation, the plotter switches should be set as shown in the diagram below.

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