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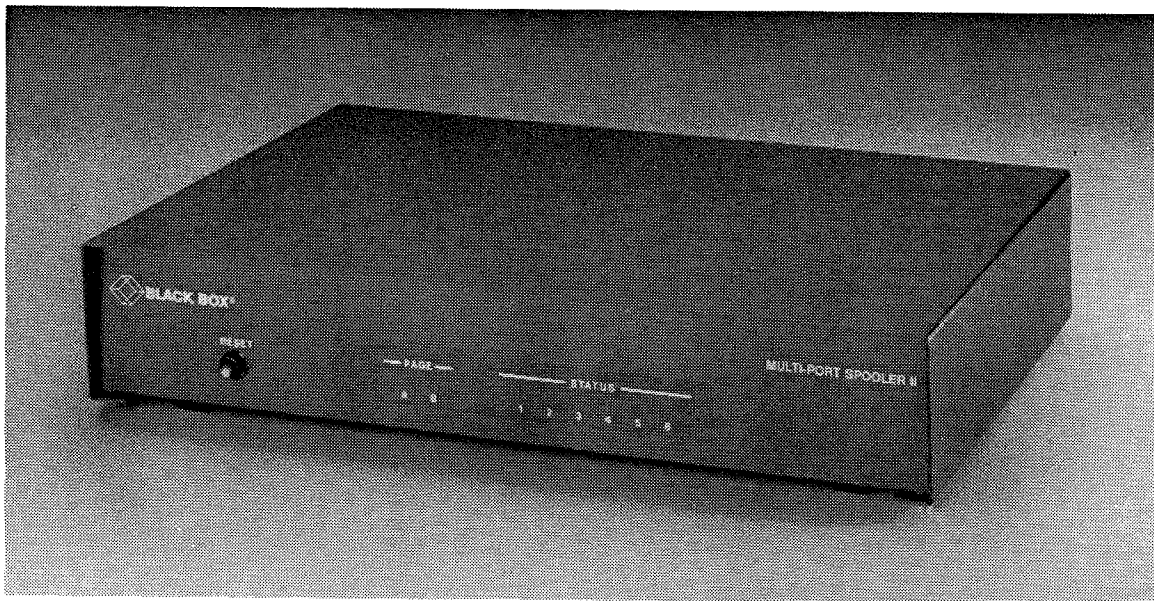
PI523A

PI524A

PI533A

PI534A

**Multi-Port Spooler II (5-to-1)**  
**Multi-Port Spooler II Plus (5-to-1)**  
**Multi-Port Spooler II (4-to-2)**  
**Multi-Port Spooler II Plus (4-to-2)**



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## 1.0 SPECIFICATIONS

**Indicators** — (8): 2 for buffer and 1 for status of each port

**Data Format** — 7 data bits, even or odd; 8 data bits, no parity; 1, 1 1/2, or 2 stop bits

**Flow Control** — Software X-ON/X-OFF, hardware handshaking

**Speeds** — 9 rates: 150, 300, 600, 1200, 2400, 4800, 9600, 19200, and 38400 Kbps

NOTE: Although the spooler will handle high-speed applications, it is not recommended for multiple simultaneous setups running at 38.4 Kbps.

**Memory** — 64K or 256K

**Interface** — RS-232C, asynchronous, ASCII (DTE)

**Connectors** — DB25 female

**Power** — 115 VAC, 50/60 Hz, 0.5 amps, 30 watts (add 6 watts for each additional 256K Expansion Board)

**Size** — 2.5" H x 10.8"W x 14.1"D (6.4 x 27.3 x 35.7 cm)

**Weight** — 7.3 lb. (3.3 kg)

**Operating Temperature** — 32-104 F (0-40 C)

**Operating Humidity**—0-90% relative humidity (non-condensing)

**Control** — Reset Button

**Switch Selectable Functions** —

- End of Job Form Feed (Enable/Disable)
- Word Length
- Number of Stop Bits
- Parity (Enable/Disable)
- Odd/Even Parity
- Adjustable Holdover Time
- X-ON on Reset
- Port Labeling

## 2.0 OVERVIEW

### 2.1 General Description

The Multi-Port Spooler II (5-to-1) and Multi-Port Spooler II (4-to-2) are compact units that combine the functions of a buffer, a spooler, and a switch. The Plus versions of these spoolers provide more buffered memory for extended print jobs. The devices work automatically, with no external operator controls, and have a built-in bidirectional feature that allows an intelligent output device (plotter) to directly communicate with an input device. All models are configured as DTEs and act as the link between a serial printer, or a pair of serial printers, and as many as five asynchronous computers or terminals.

- The Multi-Port Spooler II (5-to-1) efficiently routes data between any of *five inputs* to a *single printer* or other output device.
- The Multi-Port Spooler II (4-to-2) accepts data from *four inputs* and routes it to one of *two printers*. They support hardware and software selection of the output device.

Your unit continually scans the input buffers for data. It allows all input devices to send data at different speeds, if necessary, and then outputs the data at the speed you designate. It also uses its buffer efficiently by allowing all input ports to share a large portion of the memory as the need arises. In this way, each port is not limited to a fixed amount of memory.

Your Spooler provides for a switch-selectable hold time to help prevent accidental interruption of printing by another operator. It dynamically allocates buffer, providing memory for the ports that require it. It also automatically separates print jobs and allocates buffer space based on order of request, size of files, and amount of buffer needed. (These operating features are discussed in further detail in Section 5.)

### 2.2 Buffer Capacity

The unit is available in both 64K and 256K versions.

<u>Code</u>	<u>Name</u>	<u>Memory</u>
PI523A	Multi-Port Spooler II (5-to-1)	64 Kbytes
PI524A	Multi-Port Spooler II Plus (5-to-1)	256 Kbytes
PI533A	Multi-Port Spooler II (4-to-2)	64 Kbytes
PI534A	Multi-Port Spooler II Plus (4-to-2)	256 Kbytes

This manual will use the generic term “Multi-Port Spooler” to refer to the various versions of this unit. When distinctions are necessary, each model will be properly identified.

**NOTE:** Only 256K units may have a buffer upgrade to 2 MB.

### 3.0 CONFIGURING THE MULTI-PORT SPOOLER

In order to set up the Multi-Port Spooler for operation, the variable parameters for each port must be set. Setting these parameters is crucial in making the unit compatible with the devices connected to each port. To determine the correct value for each parameter, check the owner's manuals provided with your devices.

Before connecting the spooler to any other devices, you must configure each port of the unit with respect to the following:

- cables
- baud rates
- parity
- form feed
- word length
- stop bits
- default print

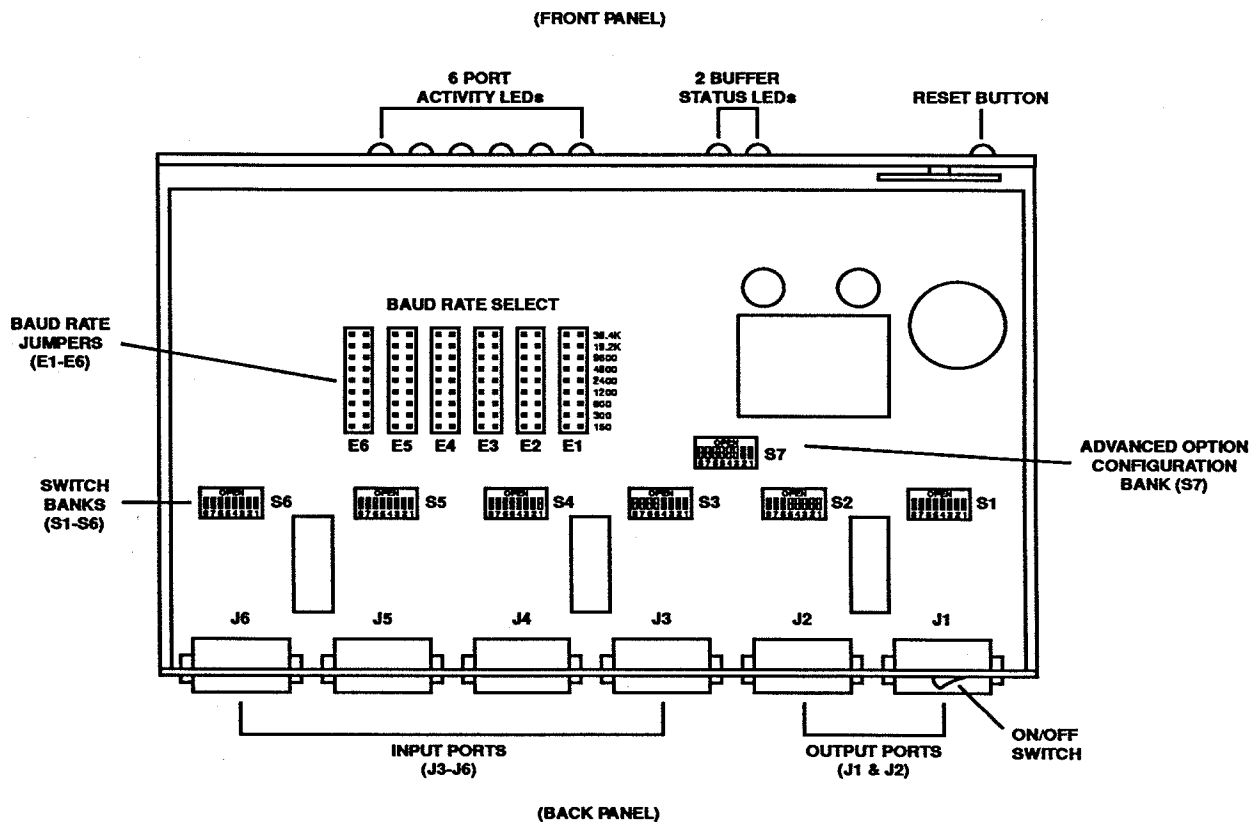


Figure 3-1. Internal Board Layout of Multi-Port Spooler II (4-to-2)

### 3.1 Cable Configuration

Before connecting the Multi-Port Spooler to any other devices, select the appropriate cables. All six ports are equipped with DB25 female connectors configured as DTE (Data Terminal Equipment). See Table 3-1 or Appendix B for pinouts and cable configurations.

### 3.2 Baud Rate Jumper Settings

Baud rates are jumper-selectable. Refer to Figure 3-1 for a diagram of the internal board layout of the Multi-Port Spooler. Notice that each of the six ports (5 input and 1 output or 4 input and 2 output) has its own double row of jumpers. These jumpers are marked on the printed circuit board with their associated baud rates, as shown in Figure 3-2.

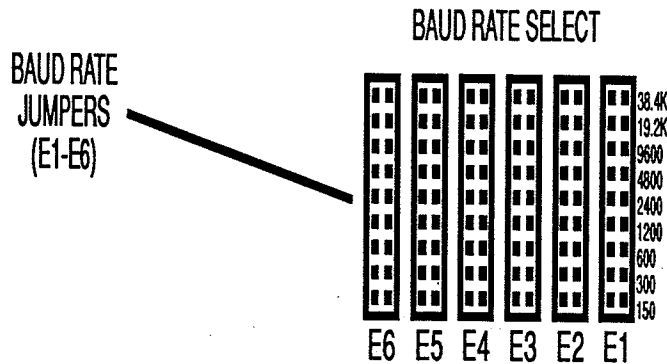


Figure 3.2. Baud Rate Jumpers

**NOTE:** Although the Multi-Port Spooler can handle high-speed applications, running multiple ports simultaneously at 38400 bps will cause a substantial decrease in Spooler throughput.

Each port's baud rate jumpers can be configured independently to meet the speed requirements of your various devices. This makes it easy to connect new devices to your printer, or existing devices to a new printer.

To change a jumper setting, simply remove the plastic block and reinsert it on the desired pins. As mentioned earlier, check your computer and printer owner's manuals to determine the proper baud rate setting for each port.



### 3.3 Individual Switch Bank Settings (Ports 1-6)

Figure 3-1 shows the location of each port's configuration switch bank. There are a total of seven switch banks—one for each port (S1 - S6) and an Advanced Option Configuration switch bank (S7) that controls the advanced options of your particular model (64K or 256K). For banks S1 through S6, the bank number equals the port to which the bank has been assigned. Table 3-1 lists the port settings for the 5-to-1 model, while Table 3-2 lists the port settings for the 4-to-2 model.

For information on Switch Bank 7, see Section 3.4.

**NOTE:** Models displaying *serial numbers of 90079999* and below will have switch banks labeled *OPEN* and *CLOSED*, while models displaying serial numbers of *90080000* and above will have switch banks labeled *OFF* and *ON*.

Table 3-1. Switch settings for the 5-to-1 unit, Ports 1 - 6

SWITCH POSITION	FUNCTION	SETTING		
1	Parity Enabled Parity Disabled	OPEN or OFF CLOSED or ON*		
2	Odd Parity Even Parity	OPEN or OFF* CLOSED or ON		
**3	End of Job Form Feed Enabled End of Job Form Feed Disabled	OPEN or OFF* CLOSED or ON		
4 & 5	Word Length:  8 data bits 7 data bits 6 data bits 5 data bits	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;">                     Position 4                      OPEN or OFF*                      CLOSED or ON                      OPEN or OFF                      CLOSED or ON                 </td> <td style="width: 50%; vertical-align: top;">                     Position 5                      OPEN or OFF*                      OPEN or OFF                      CLOSED or ON                      CLOSED or ON                 </td> </tr> </table>	Position 4 OPEN or OFF* CLOSED or ON OPEN or OFF CLOSED or ON	Position 5 OPEN or OFF* OPEN or OFF CLOSED or ON CLOSED or ON
Position 4 OPEN or OFF* CLOSED or ON OPEN or OFF CLOSED or ON	Position 5 OPEN or OFF* OPEN or OFF CLOSED or ON CLOSED or ON			
6 & 7	Stop Bits:  2 stop bits 1 stop bit 1-1/2 stop bits Undefined	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;">                     Position 6                      OPEN or OFF                      OPEN or OFF*                      CLOSED or ON                      CLOSED or ON                 </td> <td style="width: 50%; vertical-align: top;">                     Position 7                      OPEN or OFF                      CLOSED or ON*                      OPEN or OFF                      CLOSED or ON                 </td> </tr> </table>	Position 6 OPEN or OFF OPEN or OFF* CLOSED or ON CLOSED or ON	Position 7 OPEN or OFF CLOSED or ON* OPEN or OFF CLOSED or ON
Position 6 OPEN or OFF OPEN or OFF* CLOSED or ON CLOSED or ON	Position 7 OPEN or OFF CLOSED or ON* OPEN or OFF CLOSED or ON			
8	Printer Priority Normal Printer Priority High	OPEN or OFF* CLOSED or ON		

\* Denotes default settings

\*\* This option applies only to the OUTPUT port (port J1). The setting of Switch Position 3 for the INPUT ports does not affect the Form Feed operation. (See Section 3.3.3)

Table 3-2. Switch settings for the 4-to-2 unit, Ports 1 - 6

SWITCH POSITION	FUNCTION	SETTING		
1	Parity Enabled Parity Disabled	OPEN or OFF CLOSED or ON*		
2	Odd Parity Even Parity	OPEN or OFF* CLOSED or ON		
**3	End of Job Form Feed Enabled End of Job Form Feed Disabled	OPEN or OFF* CLOSED or ON		
4 & 5	Word Length:  8 data bits 7 data bits 6 data bits 5 data bits	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;">                     Position 4                      OPEN or OFF*                      CLOSED or ON                      OPEN or OFF                      CLOSED or ON                 </td> <td style="width: 50%; vertical-align: top;">                     Position 5                      OPEN or OFF*                      OPEN or OFF                      CLOSED or ON                      CLOSED or ON                 </td> </tr> </table>	Position 4 OPEN or OFF* CLOSED or ON OPEN or OFF CLOSED or ON	Position 5 OPEN or OFF* OPEN or OFF CLOSED or ON CLOSED or ON
Position 4 OPEN or OFF* CLOSED or ON OPEN or OFF CLOSED or ON	Position 5 OPEN or OFF* OPEN or OFF CLOSED or ON CLOSED or ON			
6 & 7	Stop Bits:  2 stop bits 1 stop bit 1-1/2 stop bits Undefined	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;">                     Position 6                      OPEN or OFF                      OPEN or OFF*                      CLOSED or ON                      CLOSED or ON                 </td> <td style="width: 50%; vertical-align: top;">                     Position 7                      OPEN or OFF                      CLOSED or ON*                      OPEN or OFF                      CLOSED or ON                 </td> </tr> </table>	Position 6 OPEN or OFF OPEN or OFF* CLOSED or ON CLOSED or ON	Position 7 OPEN or OFF CLOSED or ON* OPEN or OFF CLOSED or ON
Position 6 OPEN or OFF OPEN or OFF* CLOSED or ON CLOSED or ON	Position 7 OPEN or OFF CLOSED or ON* OPEN or OFF CLOSED or ON			
***8	Default to Printer 1 Default to Printer 2	OPEN or OFF* CLOSED or ON		

\* Denotes default settings

\*\* This option applies only to the OUTPUT ports (J1 and J2). The setting of Switch Position 3 for the INPUT ports does not affect the Form Feed operation. (See Section 3.3.3)

\*\*\* This option applies only to the INPUT ports (J3 - J6). The setting of Switch Position 8 for the OUTPUT ports does not affect the Default Printer setting. (See Section 3.3.6)

### 3.3.1 Parity Checking

Parity checking is a method of error control in communication between the Multi-Port Spooler and its input and output devices. If parity is enabled, the number of 1's in a grouping of bits will be either always even or always odd. As is the case with all switch settings, refer to the owner's manuals for your computer and printer to determine the proper parity setting for your system's devices. If parity is enabled on your input or output device, Position 1 should be OPEN or OFF. If parity is disabled, flip the switch to the CLOSED or ON position.

### 3.3.2 Odd/Even Parity

If parity is enabled on your device (Section 3.3.1 above), then you must select even or odd parity; that is, whether the number of 1's in a grouping of bits is always even or always odd. This is determined by the particular requirements of your input and output devices. Switch Position 2 should be OPEN or OFF to select odd parity, and CLOSED or ON for even parity.

If you have not enabled parity checking on Switch Position 1, the setting of Switch Position 2 will not affect Spooler operation. You may ignore this section.

### 3.3.3 *End-of-Job Form Feed Enable/Disable*

When your input device does not automatically send a form-feed message after each file, you run the risk of combining separate files together into one output. To provide for proper separation, the Multi-Port Spooler can insert a form feed at the end of each job. When instructed to form feed, the printer will advance the paper to the beginning of the next page, and start to print from that point. Set Position 3 of your output port switch banks to OPEN or OFF if this option is desired.

NOTE: Position 3 is not used for input ports (Switch banks 2 - 6 for the 5-to-1 unit or 3 - 6 for the 4-to-2 unit). The End of Job Form Feed option applies ONLY to the output port switch or switches. If an input device automatically sends a form feed, the Spooler will not send a second one, even if the option is enabled via Position 3 on switch banks S1 or S2. The unit will only provide an end of job form feed if an input device does not already send one.

When an input's buffer has been emptied, and the selected holdover time is exceeded, the Spooler switches to another input buffer and a form feed is inserted, if enabled. In this way, each port's files will be separated and therefore easily distinguished.

### 3.3.4 *Data Word Length*

This option allows you to specify the number of bits in a word. The Multi-Port Spooler needs to know whether your system's definition of a "word" is 5, 6, 7, or 8 data bits. Switch Positions 4 and 5 can be configured to one of these four data word lengths. Refer to Tables 3-1 and 3-2 for the various settings of Positions 4 and 5.

### 3.3.5 *Stop Bits*

This option allows you to specify 1, 1-1/2, or 2 stop bits at the end of each word. Switch Positions 6 and 7 are used to configure your device to one of the stop bit selections. Refer to Tables 3-1 and 3-2 for the various settings of Positions 6 and 7.

### 3.3.6 *Printer Options*

- *Default Printer (for the 4-to-2 models)*
- *Printer Priority (for the 5-to-1 models)*

#### 3.3.6.1 *Selecting a Default Printer for the 4-to-2 and 4-to-2 Plus*

• **Hardware Selection**—For the Multi-Port Spooler II (4-to-2) and Multi-Port Spooler II Plus (4-to-2) models, Switch Position 8 allows you to select one of the two printers as the designated output for each input device. In this way, you can set up your system according to the needs of

your inputs and availability of your printers. Set Position 8 in the OPEN or OFF position to direct output to Port 1. If Position 8 is CLOSED or ON, that input device will output to Port 2.

NOTE: You will not need to set Switch Position 8 for either of the output devices (switch banks 1 and 2). The Default Printer option applies ONLY to the Input port switches (S3 - S6) for the 4-to-2 and 4-to-2 Plus models.

• **Software Selection**—The Multi-Port Spooler II (4-to-2) and Multi-Port Spooler II Plus (4-to-2) models allow you to switch to a port other than the default output port by sending a character string to the Multi-Port Spooler. Before transferring any data to the printer, send one of the following software commands on your computer or terminal to designate the chosen output port:

Output to Port 1	ESC ESC _ 1
Output to Port 2	ESC ESC _ 2

\_ = underline (in hexadecimal, code 5F)

Once the output port has been changed via a software command, it remains the output port for that particular input device until you send a different command or make a change to the hardware (by flipping Switch Position 8).

### 3.3.6.2 Printer Priority for the 5-to-1 models

Printer priority applies only to the 5-to-1 versions of the Multi-Port Spooler. When Position 8 of Switch 1 is in the OPEN or ON position, the Spooler assigns priority to the data it is receiving. It will be able to devote the greater portion of its resources to the input port. When Position 1 is in the CLOSED or OFF position, the priority shifts to the data that is output.

### 3.4 Advanced Option Configuration (Switch Bank 7)

Switch Bank 7 must be set to match the memory on the motherboard. Refer to Table 3-3 for the correct switch settings for your particular model.

**NOTE:** Models displaying serial numbers of 90079999 and below will have switch banks labeled *OPEN* and *CLOSED*, while models displaying serial numbers of 90080000 and above will have switch banks labeled *OFF* and *ON*.

Table 3-3. Switch Settings for Advanced Option Configuration Switch Bank 7

SWITCH POSITION	FUNCTION	SETTING	
1	64K memory (PI523 or PI533) 256K memory (PI524 or PI534)	CLOSED or ON OPEN or OFF*	
2	Time-out on character sent from printer:  0.5 sec 4 sec	OPEN or OFF* CLOSED or ON	
3 & 4	Data Time-Out:  3 sec 5 sec 15 sec 50 sec	POS #3  CLOSED or ON OPEN or OFF* CLOSED or ON OPEN or OFF	POS #4  CLOSED or ON CLOSED or ON* OPEN or OFF OPEN or OFF
5	Input Scan Rate:  0.5 sec 3 sec	OPEN or OFF* CLOSED or ON	
6	Send X-on on reset or power up:  Enabled Disabled	CLOSED or ON OPEN or OFF*	
7	Send Port Header Message: Enabled Disabled	CLOSED or ON OPEN or OFF	
8	—	ALWAYS OPEN or OFF	

\*Denotes default settings.

**SWITCH POSITION 1: ADVANCED OPTION CONFIGURATION** - Set this switch to match the buffer capacity of your model: PI523A, PI533A: 64K memory (CLOSED or ON); PI524A, PI534A: 256K memory (OPEN or OFF)

**SWITCH POSITION 2: TIME-OUT ON CHARACTERS SENT FROM PRINTER** - This feature allows you to choose the amount of time the Spooler will wait for characters to be sent back from the output device(s) following data transmission. The selected time-out will maintain the link between the input and output devices long enough for necessary characters to be returned before the connection between the two devices times out.

**SWITCH POSITIONS 3 & 4: DATA TIME OUT ON CHARACTERS SENT TO THE INPUT PORT** - The user can select the amount of time the Spooler will wait after data is sent from an input port. The time out allows for temporary pauses in data transmission. If a character is received within the time limit, the time out period will begin again. Once the time out expires, the Spooler will resume scanning input buffers.

**SWITCH POSITION 5: INPUT SCAN RATE** - This option allows the user to select the amount of time the Spooler will wait for data as it scans each input port. This is an internal change that won't affect the rate of blinking of any display LEDs.

**SWITCH POSITION 6: SEND X-ON ON RESET OR POWER UP** - Some input devices require an initial X-ON signal before data can be sent. With this feature enabled, the Spooler will send an X-ON character out its input ports at each reset or power up.

**SWITCH POSITION 7: SEND PORT HEADER MESSAGE** - This appears on your output port as:

<PORT #>

followed by a string of data.

**SWITCH POSITION 8: UNUSED** - This switch should not be moved from the position you find it in.

## 4.0 INSTALLATION

### 4.1 Connecting the Multi-Port Spooler

Once you have configured the internal switches and baud rate jumpers, you are ready to connect the Multi-Port Spooler to your input and output devices. The ports are accessed through DB25 female connectors located on the rear panel of the unit. The INPUT and OUTPUT ports are labeled. All ports are configured as Data Terminal Equipment (DTE). Table 4-1 outlines the pin assignments and signal functions for the Multi-Port Spooler as a DTE unit.

**NOTE:** Ensure that you have configured each port for the devices you are attaching before powering up the Multi-Port Spooler.

To connect the Spooler to an AC power supply, insert the Multi-Port Spooler's three-prong plug into a grounded outlet.

Table 4-1. Multi-Port Spooler (DTE) Pinouts and Signal Functions

PIN	SIGNAL	DIRECTION (into/out of Spooler)	FUNCTION
1	Earth/Chassis Ground		Attaches to the cable shield if one is provided.
2	Transmit Data	Out of Spooler	RS-232C signal carrying serial data from the Spooler to the remote equipment.
3	Receive Data	Into Spooler	RS-232C signal carrying serial data into the Spooler from remote equipment.
4 and 20	Request to Send	Out of Spooler	RS-232C signal that is held at approximately +12V when Spooler is active and sufficient buffer space is available. Signal is set to -12V when buffer is full. The pins are used for hardware handshaking between the Spooler and an input device.
5 and 8	Clear To Send	Into Spooler	RS-232C signal which enables the Spooler to transmit data. If clear to send is not supplied by external equipment, the spooler will not output data. The pins are used for hardware handshaking between Spooler and output device.
7	Signal Ground		Ground reference for RS-232C signals. (May or may not be identical to Earth ground.)

## 4.2 Installing the Memory Expansion Board

If you want to expand the memory of your Multi-Port Spooler II Plus (5-to-1) or (4-to-2) unit, install one of our memory expansion boards. The PI525-C model increases your memory by 256K, the PI526-C by 768K, and the PI527-C by 1.75M.

Follow these steps to install the Memory Expansion Board:

1. Remove the four screws on the base card. (Refer to Figure 4.1 for the location of the screws.)
2. Install the four standoffs provided with the card.
3. Insert the three ribbon connectors into J7, J8, and J9, making sure pin 1 goes into the socket's pin 1.
4. Install the power line (terminated in a keyed connector) into J11 on the base card.
5. Put the four screws previously removed from the base into the holes provided on the Memory Expansion Board. This completes the installation.

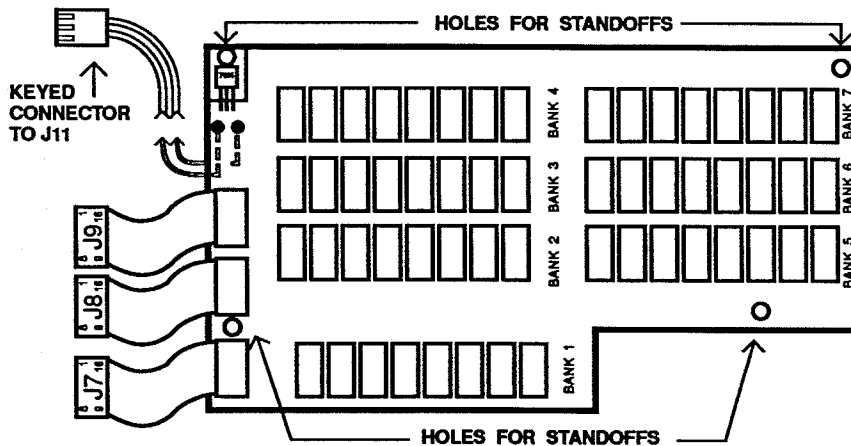


Figure 4-1. Memory Expansion Board



## 5.0 OPERATION

This section covers the basic operational features of the Multi-Port Spooler II. It discusses how data is handled by the Spooler, the methods of flow control, and possible error conditions.

### 5.1 Buffering Techniques

#### 5.1.1 *Automatic Operation*

After the initial setup, the Multi-Port Spooler operates automatically, requiring no operator instructions. The Spooler monitors and stores all data from each of the attached inputs, outputting it when the printer is ready to accept data. Since no one is manually controlling the switching of ports, there is no chance of losing data because someone accidentally switched your port off in the middle of printing.

#### 5.1.2 *Automatic Scanning of Ports*

The Multi-Port Spooler continually scans all input buffers for data. When data is received from any port, it is stored in an internal buffer area.

Any time the output port or ports are idle, the Spooler checks the input buffers for data. When data is received, the input port's data is sent to the unit's buffer. The Multi-Port Spooler then sends the data to the selected output device until that buffer is emptied. The Spooler waits the selected holdover time for additional data from that port. If no data is present, the unit returns to scanning all input buffers.

#### 5.1.3 *Dynamic Allocation of Buffer*

Each input device is allocated a minimum buffer space. The remaining RAM is distributed according to the current demand of all five or four input ports. This feature, referred to as dynamically allocated buffer, allows more efficient use of buffer space by allocating it as needed.

### 5.2 Handshaking

Since the Multi-Port Spooler can normally accept data much faster than most output devices (printers, plotters, etc.), some form of flow control is necessary to prevent the Spooler's output from overrunning the output device's ability to accept the data. This process is referred to as "handshaking" and is the way the input and output devices control data transmission.

There are two methods of flow control available for serial input and output devices — hardware and software handshaking. Either or both of these methods can be used with the Multi-Port Spooler, depending on the method or methods the attached device supports. For descriptions of each of the unit pinouts, see Table 4-1.

- Serial Input Devices (Computers/Terminals)

a. *Hardware Handshaking*: When its buffer is almost full, the Spooler drops DTR (pin 20) and RTS (pin 4), changing the signal from +12V to -12V. When the output device has emptied the Spooler's buffer to the point that enough memory is available to accommodate more input data, the Spooler raises DTR and RTS (pin 20 and pin 4 revert to +12V). This notifies the input device to resume data transmission.

b. *Software Handshaking*: When the Spooler's buffer is almost full, an X-OFF character is sent to the input device via the Spooler's Transmit pin (pin 2). The Spooler will send an X-ON character on pin 2 once the output device has accepted enough data, leaving enough room in the buffer so that more input data can be stored.

- Serial Output Device (Printer)

a. *Hardware Handshaking*: When the output device cannot accept any more data, it drops the handshaking signal, changing the signal from +12V to -12V. When the output device is ready to accept more data, it raises the handshaking signal (it returns to +12V). (The Multi-Port Spooler recognizes pins 5 or 8 for hardware handshaking.)

b. *Software Handshaking*: When the output device cannot accept any more data, it sends an X-OFF character to the Spooler's receive pin (pin 3) on the output port. When the output device is ready to receive more data, it sends an X-ON character by way of pin 3.

NOTE: Pin 8 or 5 (Data Carrier Detect) on all ports must be at a positive (+12V) signal for software flow-control between the Spooler and the connected devices to take place.

(If the flow control function is not operating properly, causing a buffer overflow, refer to Section 5.5, Error Conditions.)

### 5.3 Reset Button

The RESET button is located on the front panel of the unit. Press it to clear the Spooler's buffer. All data that had been saved up to that point in the Spooler will be deleted, and you may then start fresh with an empty buffer.

Another instance when you will use the RESET button is in the case of an error condition. (See Section 5.5.) Once you encounter an error condition (indicated by an error message), and make changes to remedy the problem, you must reset the unit before resuming operation.

## 5.4 LED Indicators

The LEDs on the Multi-Port Spooler are labeled as follows: A B 1 2 3 4 5 6

Lights A and B indicate how much memory has been filled while lights 1 through 6 correspond to ports 1-6, respectively. The memory light scheme is as follows:

LIGHTS		MEMORY
A off	B off	unit's buffer space is less than 1/4 full.
A on	B off	unit's buffer is between 1/4 and 1/2 full.
A off	B on	unit's buffer is between 1/2 and 3/4 full.
A on	B on	unit's buffer is between 3/4 full and completely full.

NOTE: If a print job is sent and LED A remains on, it is due to internal "housekeeping" memory use.

The light scheme for the 6 ports is as follows:

- A solid "ON" LED indicates a port that is receiving data.
- A blinking LED indicates a port that is outputting data.

The LED will blink a certain number of times followed by a pause indicating the port of origin of the information that it is currently outputting. For example, if the LED associated with port 2 is blinking 5 times, then the information going out port 2 came from port 5. The LED associated with port 5 will be on as long as information is coming into the port. When the buffer has processed all current jobs, the LEDs will then return to the scan mode.

## 5.5 Error Conditions

### 5.5.1 Buffer Overflow

Overflows and framing errors are indicated by a message to the printer. Both result in the disablement of the offending port.

Buffer-overflow errors indicate that handshaking has failed at a particular port. To remedy the problem, check the cabling pin configuration to make sure it suits the requirements of your particular device. Once you are ready to resume operation, press the RESET button.

Following is an example of a framing error:

```
<CR><CR>FRAMING_ERROR(WRONG SPEED)_ON_PORT  
_000#PORT_WILL_BE_DISABLED_UNTIL_RESET<FF><CR><LF>
```

where:

# = input port number (the port that has the error)  
<CR> = carriage return  
<FF> = form feed

<LF> = line feed  
\_ = space

### 5.5.2 Parity Errors

Parity errors are indicated by a substitution of a “&” character for the character in error. For instance, if the output on your printer consists entirely of “&&&&&&&&&” characters, the problem most likely is with opposite parity settings on your input device and Multi-Port Spooler. To clear this condition, adjust the odd/even parity switch for the port in question so that it matches the required configuration of the input device. The LED for the input port that has the framing error flashes, indicating an error has occurred. The error LED also flashes. The unit must be reset to enable that port again.

NOTE: Other ports can be used while one port is reporting Framing Errors.

## WARNING

**Ensure that the power is disconnected from the Multi-Port Spooler when working within the unit. High voltages are present on the power supply, and can cause electrical shock if the unit is tampered with while power is connected.**

**APPENDIX A RS-232C INTERFACE**

**RS-232 Interface (Female)**

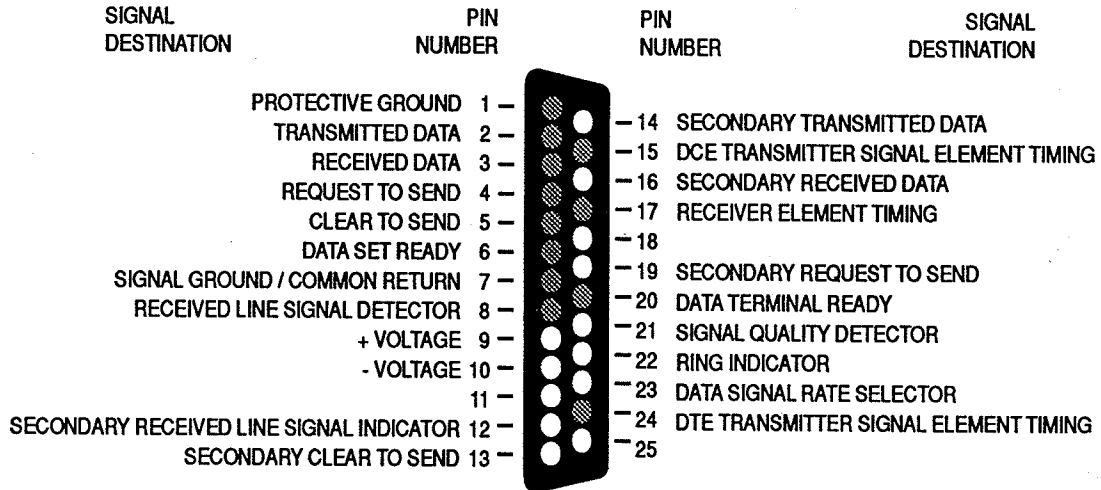


Figure A-1. RS-232-C Interface

## APPENDIX B CABLE CONFIGURATION

The following cable configurations are provided for some popular makes and models of computers and printers to enable you to connect your computer and printer to the Multi-Port Spooler. Note that once the connection between the spooler and the computer has been established, the unit is bidirectional. The output port will respond to X-ON/X-OFF characters, and will not pass them through as data.

### COMPUTERS

#### Multi-Port Spooler

#### Northstar or Osborne

DB25 male  
(DTE)

DB25 female  
(DCE)

TX 2	—————>	2 RX
RX 3	<—————	3 TX
GND 7	—————	7 GND
DTR 20	—————>	20 CTS

#### Multi-Port Spooler

#### Apple III, Apple S, S Dynabyte

DB25 male  
(DTE)

DB25 male  
(DTE)

TX 2	—————>	3 RX
RX 3	<—————	2 TX
GND 7	—————	7 GND
DTR 20	—————>	20 CTS

#### Multi-Port Spooler

#### Apple II (CCS 7710)

DB25 male  
(DTE)

DB25 female  
(DCE)

TX 2	—————>	2 RX
RX 3	<—————	3 TX
GND 7	—————	7 GND
DTR 20	—————>	4 CTS
RTS 4	—————>	20 DTR

#### Multi-Port Spooler

#### IBM®, HP®-150

DB25 male  
(DTE)

DB25 female  
(DTE)

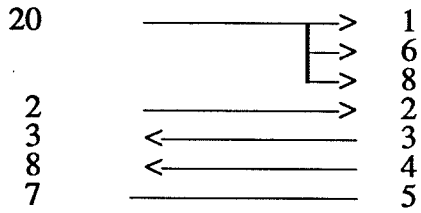
TX 2	—————>	3 RX
RX 3	<—————	2 TX
GND 7	—————	7 GND
DTR 20	—————>	5 CTS }jumpared
		6 DSR
		8 CD
8 or 5	<—————	20 DTR

Multi-Port Spooler

IBM AT®

DB25 male  
(DTE)

DB9 female

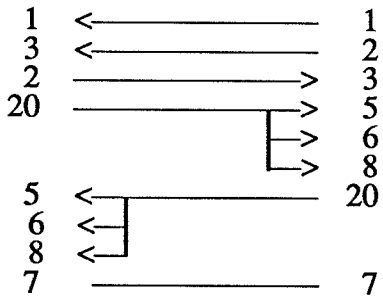


Multi-Port Spooler

IBM PC/XT™ (Input)

DB25 male  
(DTE)

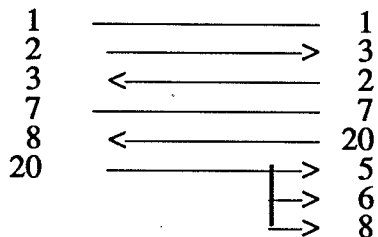
DB25 female



PRINTERS

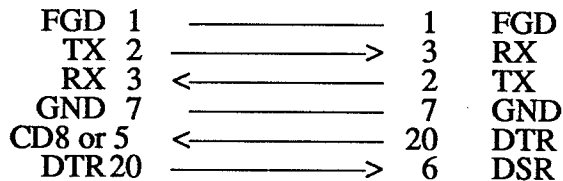
Multi-Port Spooler                      Typical Printer (DTE Output)

DB25 male                                      DB25 male



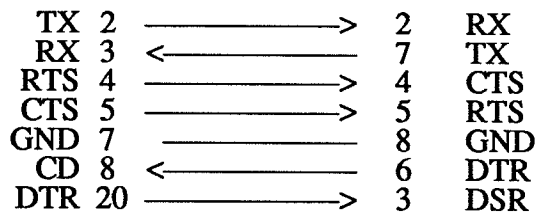
Multi-Port Spooler                      Laser Printer

DB25 male                                      DB25 male  
(DTE)    (DTE)

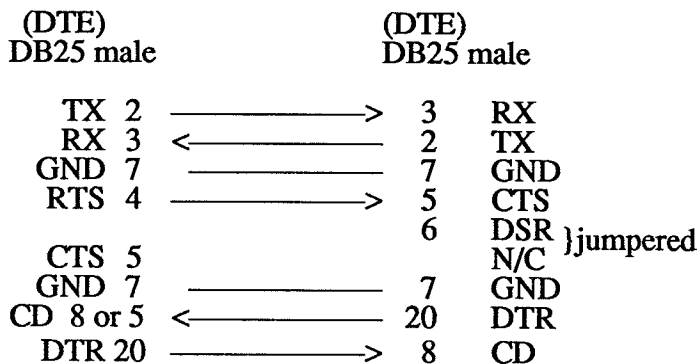


Multi-Port Spooler                      Sellum Printer

DB25 male                                      50-pin Amphenol male  
(DTE)    (DTE)



Multi-Port Spooler                      NEC Printers  
(5510-15:20:25)  
(7710-15:20:25)

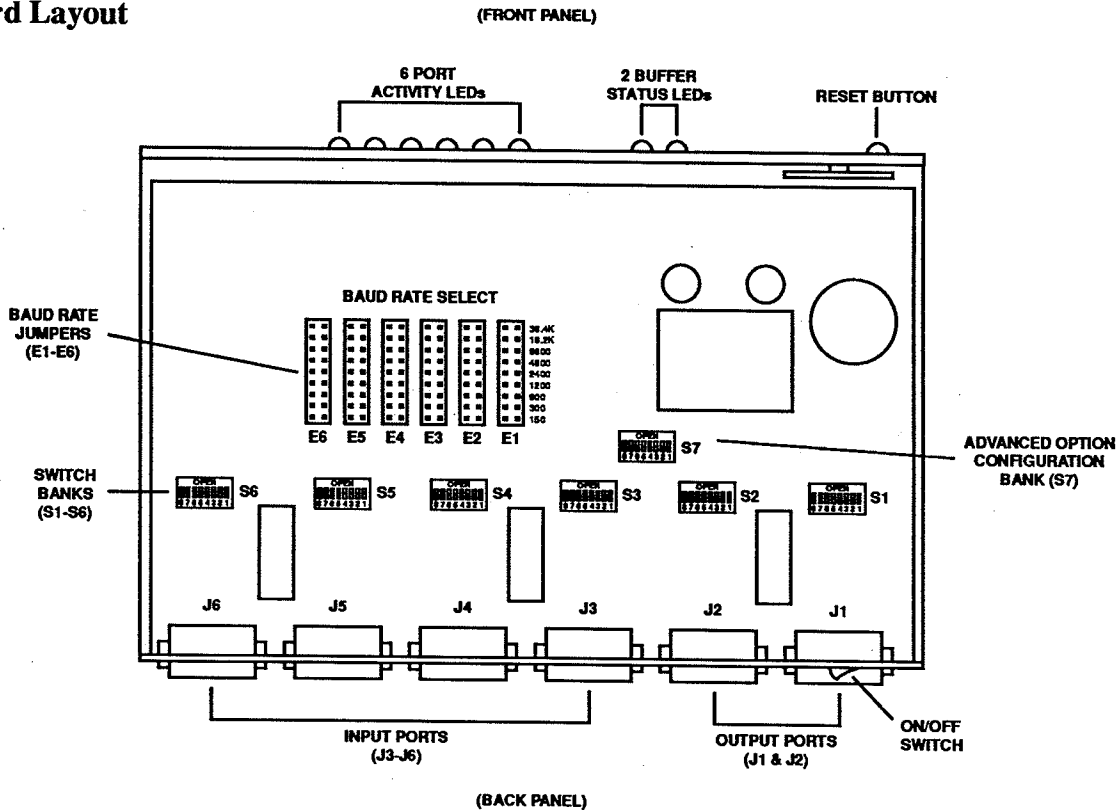




**TROUBLESHOOTING GUIDE**  
**MULTI-PORT SPOOLER (4-TO-2) AND (4-TO-2) PLUS**

Problem	Technical Recommendation
1. Printout interrupted by another printout.	1. Increase data time-out (refer to switch charts).
2. Form-feed interrupts printout.	2. Increase data time-out (refer to switch charts).
3. Mixes garbled data with proper characters and words.	3. A buffer overflow may be the problem. Check to make sure the word structure set for the Spooler matches the word structure for your equipment.
4. No throughput.	4. Check the cables connecting the Spooler to your equipment for the proper pinouts.

**Board Layout**



## APPENDIX C QUICK SETUP AND TROUBLESHOOTING GUIDE MULTI-PORT SPOOLER (5-TO-1) AND (5-TO-1) PLUS

### Setup Steps

1. Configure each port's baud rate jumper
2. Use the switch charts to configure each port's switch bank and the Advanced Option Bank.
3. Connect your Multi-Port Spooler to five serial input devices and one serial output device.
4. Plug the unit into an AC power source.
5. If you have difficulty using your Spooler, check your connections and settings, and then consult the Troubleshooting Guide.

### Switch Settings For Ports 1-6

SWITCH POSITION	FUNCTION	SETTING (* indicates default)		
1	Parity Enabled Parity Disabled	OPEN or OFF CLOSED or ON*		
2	Odd Parity Even Parity	OPEN or OFF* CLOSED or ON		
3	End of Job Form Feed Enabled End of Job Form Feed Disabled	OPEN or OFF* CLOSED or ON		
4 & 5	Word Length:  8 data bits 7 data bits 6 data bits 5 data bits	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;">Position 4 OPEN or OFF* CLOSED or ON OPEN or OFF CLOSED or ON</td> <td style="width: 50%; border: none;">Position 5 OPEN or OFF* OPEN or OFF CLOSED or ON CLOSED or ON</td> </tr> </table>	Position 4 OPEN or OFF* CLOSED or ON OPEN or OFF CLOSED or ON	Position 5 OPEN or OFF* OPEN or OFF CLOSED or ON CLOSED or ON
Position 4 OPEN or OFF* CLOSED or ON OPEN or OFF CLOSED or ON	Position 5 OPEN or OFF* OPEN or OFF CLOSED or ON CLOSED or ON			
6 & 7	Stop Bits:  2 stop bits 1 stop bit 1-1/2 stop bits Undefined	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;">Position 6 OPEN or OFF OPEN or OFF* CLOSED or ON CLOSED or ON</td> <td style="width: 50%; border: none;">Position 7 OPEN or OFF CLOSED or ON* OPEN or OFF CLOSED or ON</td> </tr> </table>	Position 6 OPEN or OFF OPEN or OFF* CLOSED or ON CLOSED or ON	Position 7 OPEN or OFF CLOSED or ON* OPEN or OFF CLOSED or ON
Position 6 OPEN or OFF OPEN or OFF* CLOSED or ON CLOSED or ON	Position 7 OPEN or OFF CLOSED or ON* OPEN or OFF CLOSED or ON			
8	Printer Priority Normal Printer Priority High	OPEN or OFF* CLOSED or ON		

### Switch Settings For Port 7

POSITION	FUNCTION	SETTING	POSITION	FUNCTION	SETTING
1	64K memory (PI523A or PI533A) 256K memory (PI524A or PI534A)	CLOSED or ON OPEN or OFF*	5	Input Scan Rate:  0.5 sec 3 sec	OPEN or OFF* CLOSED or ON
2	Time-out on character sent from printer:  0.5 sec 4 sec	OPEN or OFF* CLOSED or ON	6	Send X-on on reset or power up:  Enabled Disabled	CLOSED or ON OPEN or OFF*
3	Data Time-Out:  3 sec 5 sec 15 sec 50 sec	CLOSED or ON OPEN or OFF* CLOSED or ON OPEN or OFF	7	Send Port Header Message:  Enabled Disabled	CLOSED or ON OPEN or OFF
4	Data Time-Out  3 sec 5 sec 15 sec 50 sec	CLOSED or ON CLOSED or ON* OPEN or OFF OPEN or OFF	8	—	ALWAYS OPEN or OFF

\* indicates default

\* indicates default





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