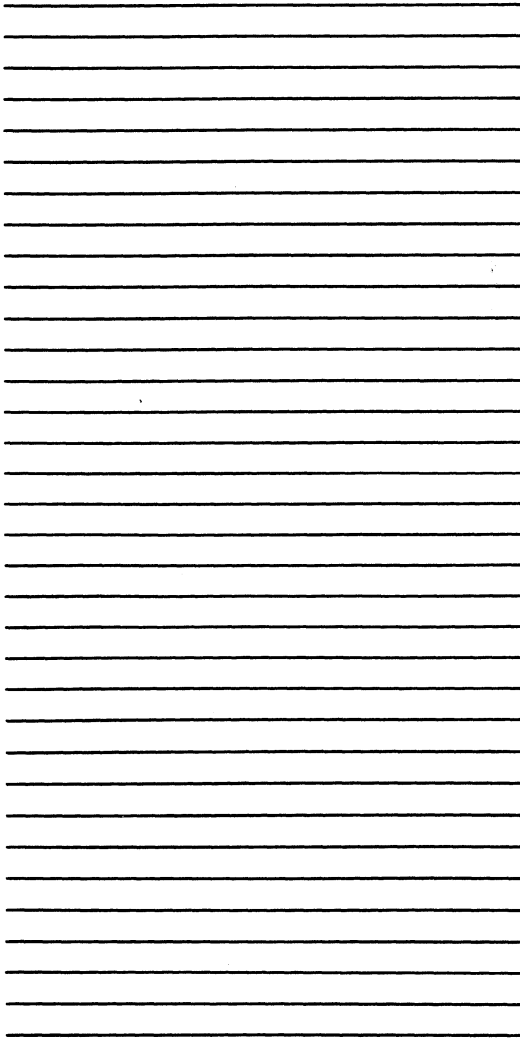


*8-Port  
Serial  
Controller  
User Guide*



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GOVERNOR



**8-PORT  
SERIAL  
CONTROLLER**

**User  
Guide**

**November 1988**

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# 1.0 FEATURES

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The POINT 4 8-Port Serial Controller has the following features:

- AT terminal controller with 8 RS-232 ports
- Up to 3 boards supported
- Optional interrupt status register for all 8 ports
- Convenient on-board RJ connectors
- Supported by Unix\* and Xenix\*\*

---

\*Unix is a trademark of AT&T Bell Laboratories

\*\*Xenix is a registered trademark of Microsoft Corporation

## 2.0 GENERAL DESCRIPTION

---

The 8-Port Serial Controller is designed for the PC AT and compatibles to provide the control for eight RS-232 devices. The card can be plugged into either an 8-bit or 16-bit slot. Connection to external devices is made with RJ-11 type connectors.

The eight ports (Ports 0 to 7) have RJ connectors mounted on the 8-Port Serial Controller, and are accessible through the board's mounting plate. Up to three 8-Port Serial Controllers may be chained together on one interrupt if the software driver allows it.

When more than one board is used on an interrupt, a cable is needed to carry the Interrupt Request Signal from one board to another. Port 0 is at the bottom on the 8-Port Serial Controller.



## 3.0 CONFIGURATION

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The configuration of the POINT 4 8-Port Serial Controller varies with the operating system. The following subsections provide instructions for both Xenix and Unix installations.

### 3.1 Configuring Your 8-Port Serial Controller Under Xenix

Xenix has a built-in software driver for Arnet\*-compatible serial controllers such as the POINT 4 8-Port Serial Controller; the driver supports up to two such controllers.

This driver uses the interrupts for the standard communications ports (Com 1 and Com 2); thus, one Com port is disabled for each 8-Port Serial Controller that is enabled. Because the driver supports only one serial controller per interrupt, multiple boards cannot be wired together (as described in Section 5.1).

To prepare an 8-Port Serial Controller to use interrupt 4 (Com 1):

1. Place the jumper across location 3 of JP1.
2. Place the jumper across location 3 (IRQ4) of JP2.
3. Set SW1 to address 100H (1 0 1 1) or 280H (0 1 0 1), where 1=CLOSED and 0=OPEN.
4. Set switch 7 of SW2 to off (open or 0).
5. Set switches 1-6 of SW2 to 140H (1 0 1 0 1 1) if SW1 was set to 100H, or set switches 1-6 to 2C0H (0 1 0 0 1 1) if SW1 was set to 280H.

---

\*Arnet is a tradename of Arnet Corporation

To prepare an 8-Port Serial Controller to use interrupt 3 (Com 2):

1. Place the jumper across location 3 of JP1.
2. Place the jumper across location 2 (IRQ3) of JP2.
3. Set SW1 to address 180H (1 0 0 1) or 300H (0 0 1 1).
4. Set switch 7 of SW2 to off (open or 0).
5. Set switches 1-6 of SW2 to 1C0H (1 0 0 0 1 1) if SW1 was set to 180H, or set switches 1-6 to 340H (0 0 1 0 1 1) if SW1 was set to 300H.

With the power off, install the board(s) into any available expansion slot on the system, power up and boot Xenix. If the boards are properly installed, Xenix will display the following message during the hardware self-test for each board:

Arnet serial board COMx has 8 ports

(where x is the number of the Com port)

Enter Maintenance (single-user) mode under Xenix and type "mkdev serial".

Enter the number for the 8-port serial card option.

Enter the com port number to be used by the 8-Port Serial Controller.

Shut the system down and connect a terminal to the 8-Port Serial Controller. Boot the system and enter Normal (multi-user) mode.

Ports on the 8-Port Serial Controller assigned to Com 1 are labeled tty1a through tty1h (tty1a is at the bottom). Ports on the second com port are labeled tty2a through tty2h.

Login as root and type the command "enable", followed by the names of the ports to enable, for example:

```
enable tty1a tty1b tty1c tty1d tty1e tty2h tty2a tty2c
```

The Xenix login prompt should appear on each terminal after it is enabled. If it does not, try the following:

Check the cabling between terminal and system to be sure it is secure.

Enter the command "ps -ef" and verify that the software has activated that terminal.

Use the "disable" command to disable the port, then re-enable it.

Check the parity, number of bits and baud rate settings of the terminal against the values in the /etc/ttys and /etc/gettydefs files for that port. In the /etc/tty file there will be an entry for each port; for example tty2a may have an entry such as 1m tty2a. The first character of the entry is "1" if the port is enabled and "0" if it is disabled. The second character ("m") corresponds to an entry in the /etc/gettydefs file which defines the port characteristics.

Shut the system down and reboot; the hardware diagnostic should display a message stating that there are 8 ports on the com port and that the board is Arnet-compatible. If only one port is recognized, check the IRQ setting of JP2 and verify that the board is properly seated in the expansion slot. If the board is recognized, but as a type other than Arnet, check the addressing of SW1 and SW2.

For more information, refer to the following:

SCO XENIX System V Operating System User's Reference, entry entitled MKDEV in section (C), by Microsoft Corporation, 1987.

SCO XENIX System V Operating System Run Time Environment Microsoft Corporation, 1987.

## **3.2 Configuring Your 8-Port Serial Controller Under Unix**

Under many Unix-type operating systems, up to three POINT 4 8-Port Serial Controllers can be configured on one interrupt. Multiple boards must have contiguous addresses, and the Interrupt Request Signal must be passed from one board to another by means of a single-wire cable.

For each board, two switch modules (SW1 and SW2) and two jumper blocks (JP1 and JP2) must be set. Refer to your Unix vendor installation documentation for the appropriate SW1 and SW2 switch setting. Section 4.0 provides information for setting these switches. Refer to Section 5.0 for information on setting the jumpers and installing the cable between multiple boards.

## 4.0 SWITCHES

---

This section lists the possible settings for the board I/O port select switch, SW1, and the optional interrupt register switch, SW2. Table 1 and Table 2 use the following switch setting convention:

1=ON=CLOSED

0=OFF=OPEN

### 4.1 Board I/O Port Select-SW1

SW1 is a switch module with four switch positions. This switch is used to determine the I/O locations used by the 8-Port Serial Controller. Each port will occupy eight I/O addresses resulting in a total of 64 I/O locations for the 8-Port Serial Controller. The switch setting determines the address of the I/O location of the first port. Each subsequent port will then have a starting I/O location equal to that of the previous port plus eight. All port addresses will be contiguous. The switch may be set to any I/O address that is a multiple of 40(HEX). Refer to Table 1 for the switch setting instructions.

**TABLE 1. BOARD I/O PORT SELECT-SW1**

I/O Location (in HEX)	Switch Position			
	1	2	3	4
000	1	1	1	1
040	1	1	1	0
080	1	1	0	1
0C0	1	1	0	0
100	1	0	1	1
140	1	0	1	0
180	1	0	0	1
1C0	1	0	0	0
200	0	1	1	1
240	0	1	1	0
280	0	1	0	1
2C0	0	1	0	0
300	0	0	1	1
340	0	0	1	0
380	0	0	0	1
3C0	0	0	0	0

## 4.2 Optional Interrupt Register-SW2

SW2 is a switch module with eight switch positions (SW2-position 8 is not used). This switch is used to determine the I/O location of the UART's Interrupt Latch Register. This register receives the Interrupt Signal from each of the 8 UARTs, and is read by the system using the I/O location address specified by the setting of SW2. Note that if this optional Interrupt Register is not being used, switch position 7 must be set to the ON position. To use this optional Interrupt Register, choose a block of ten (HEX) locations, not in use by any other devices in the system. The switch module may be set to I/O location 000(HEX), or any other location that is a multiple of 10(HEX) as shown in Table 2.

**NOTE:** SW1 (7) is set to 1 at the factory.

**TABLE 2. OPTIONAL INTERRUPT REGISTER-SW2 (1 of 4)**

I/O Location (in HEX)	Switch Position					
	1	2	3	4	5	6
000	1	1	1	1	1	1
010	1	1	1	1	1	0
020	1	1	1	1	0	1
030	1	1	1	1	0	0
040	1	1	1	0	1	1
050	1	1	1	0	1	0
060	1	1	1	0	0	1
070	1	1	1	0	0	0
080	1	1	0	1	1	1
090	1	1	0	1	1	0
0A0	1	1	0	1	0	1
0B0	1	1	0	1	0	0
0C0	1	1	0	0	1	1
0D0	1	1	0	0	1	0
0E0	1	1	0	0	0	1
0F0	1	1	0	0	0	0

7=1 When  
option not used.  
7=0 When  
option used.



**TABLE 2. OPTIONAL INTERRUPT REGISTER-SW2 (2 of 4)**

I/O Location (in HEX)	Switch Position					
	1	2	3	4	5	6
100	1	0	1	1	1	1
110	1	0	1	1	1	0
120	1	0	1	1	0	1
130	1	0	1	1	0	0
140	1	0	1	0	1	1
150	1	0	1	0	1	0
160	1	0	1	0	0	1
170	1	0	1	0	0	0
180	1	0	0	1	1	1
190	1	0	0	1	1	0
1A0	1	0	0	1	0	1
1B0	1	0	0	1	0	0
1C0	1	0	0	0	1	1
1D0	1	0	0	0	1	0
1E0	1	0	0	0	0	1
1F0	1	0	0	0	0	0

7=1 When option not used.  
7=0 When option used.

**TABLE 2. OPTIONAL INTERRUPT REGISTER-SW2 (3 of 4)**

I/O Location (in HEX)	Switch Position					
	1	2	3	4	5	6
200	0	1	1	1	1	1
210	0	1	1	1	1	0
220	0	1	1	1	0	1
230	0	1	1	1	0	0
240	0	1	1	0	1	1
250	0	1	1	0	1	0
260	0	1	1	0	0	1
270	0	1	1	0	0	0
280	0	1	0	1	1	1
290	0	1	0	1	1	0
2A0	0	1	0	1	0	1
2B0	0	1	0	1	0	0
2C0	0	1	0	0	1	1
2D0	0	1	0	0	1	0
2E0	01	1	0	0	0	1
2F0	0	1	0	0	0	0

7=1 When option not used.  
7=0 When option used.

**TABLE 3. OPTIONAL INTERRUPT REGISTER-SW2 (4 of 4)**

I/O Location (in HEX)	Switch Position					
	1	2	3	4	5	6
300	0	0	1	1	1	1
310	0	0	1	1	1	0
320	0	0	1	1	0	1
330	0	0	1	1	0	0
340	0	0	1	0	1	1
350	0	0	1	0	1	0
360	0	0	1	0	0	1
370	0	0	1	0	0	0
380	0	0	0	1	1	1
390	0	0	0	1	1	0
3A0	0	0	0	1	0	1
3B0	0	0	0	1	0	0
3C0	0	0	0	0	1	1
3D0	0	0	0	0	1	0
3E0	0	0	0	0	0	1
3F0	0	0	0	0	0	0

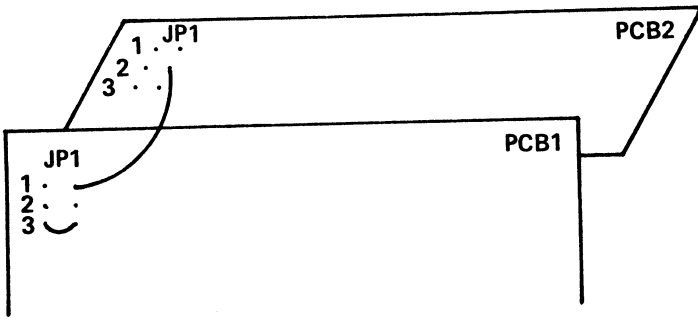
7=1 When option not used.  
7=0 When option used.

## 5.0 JUMPER BLOCKS

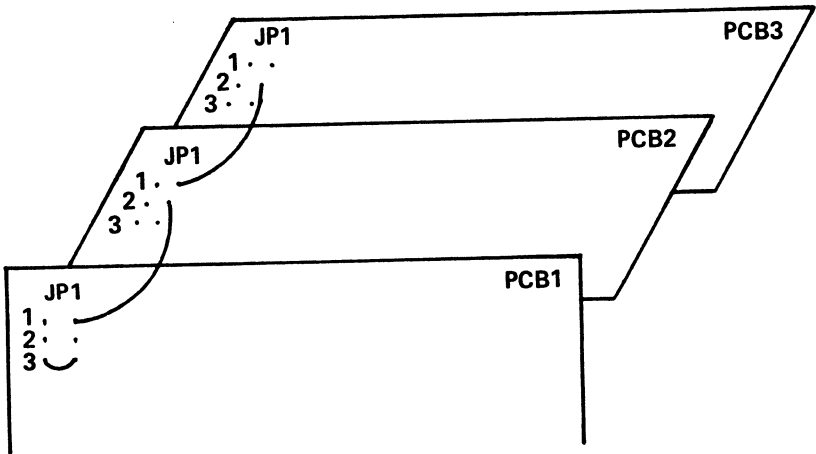
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### 5.1 Single and Multiple 8-Port Serial Controller Configurations-Jumper JP1

1. If only one 8-Port Serial Controller per interrupt is used, set the jumper across location 3 of JP1.
2. If two 8-Port Serial Controllers are used on one interrupt, the Interrupt Request Signal from Board 2 must be brought to Board 1. This is done as follows:
  - a. Place a jumper on Board 1 across location 3 of JP1 (see Figure 1, PCB1).
  - b. Install the single-wire cable on Board 1, Pin 1, of JP1. Install the other end of this cable on Board 2, Pin 2, of JP1 (see Figure 1).
3. When three 8-Port Serial Controllers are used on one interrupt, the Interrupt Request Signal from Board 1 must be brought to Board 2, ORed with the interrupts of Board 2 and the resultant signal is then brought to Board 3. To configure a three-board system, follow these simple instructions (see Figure 2):
  - a. Place a jumper on Board 1 across location 3 of JP1.
  - b. Install a single-wire cable on Board 1, Pin 1, of JP1. Install the other end of this cable on Board 2, Pin 2, of JP1.
  - c. Install a second single-wire cable on Board 2, Pin 1, of JP1. Install the other end of this cable on Board 3, Pin 2, of JP1.



**Figure 1. Two 8-Port Controller Configuration**



**Figure 2. Three 8-Port Controller Configuration**

## 5.2 Interrupt Request-Jumper (JP2)

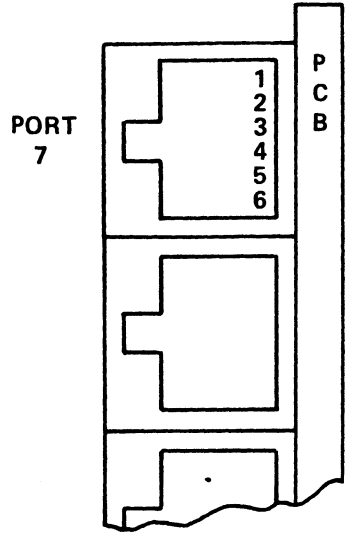
The 8-Port Controller may be configured to assert its interrupt request on any interrupt line between IRQ2 and IRQ7. Jumper block JP2 is used to select the desired IRQ level. The following table shows the jumpering instructions:

IRQ2	Jumper	across location 1 (IRQ2)
IRQ3	Jumper	across location 2 (IRQ3)
IRQ4	Jumper	across location 3 (IRQ4)
IRQ5	Jumper	across location 4 (IRQ5)
IRQ6	Jumper	across location 5 (IRQ6)
IRQ7	Jumper	across location 6 (IRQ7)

## 6.0 INPUT/OUTPUT CONNECTION

---

- 1 RTS
- 2 TX DATA
- 3 CTS
- 4 REC DATA
- 5 GND
- 6 CHASSIS GND



FRONT VIEW  
OF CONNECTOR PORT 7

# NOTES



# COMMENT SHEET

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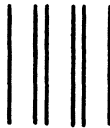
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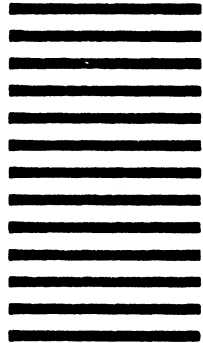
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