MultiPort™

EXPANSION BOARD
USER'S MANUAL

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A Note Concerning TV and Radio Interference

FCC Information

This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual, may cause interference to radio communications.

It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference; in which case, the user at his own expense will be required to take whatever measures may be required to correct the interference.

SHIELDED CABLE MUST BE USED TO REMAIN IN COMPLIANCE WITH FCC CLASS A.

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SECTION ONE

Introduction

The Arnet MultiPort family of expansion boards adds four or eight serial ports to computers for connecting terminals, printers, and modems in multiuser systems.

The four and eight port boards each have a DB-62 connector and use a cable with multiple female DB-25 connectors to connect any device with an RS-232 interface to your computer. Two optional types of connectors are available for the eight port board: an eight port D-sub connector box with DB-25 connectors and a modular connector block containing eight RJ-45 modular connectors. Each board and connector package is supplied with all the hardware and software needed for a complete board installation.

All Arnet MultiPort boards include SurgeBlock™, which is designed to protect the board and the computer in which it is installed against damage from data line surges.

SECTION **TWO**

Protecting Your Equipment and Data

Electrical Surge and Power Protection

Lightning, electrical surges, and power fluctuations can damage your equipment and/or data through the power lines and/or the serial data lines. When electrical storms occur, the most effective method of protecting your computer system is to unplug your computer and peripherals, and disconnect all data and telephone lines.

To protect against lightning, electrical surges, and power fluctuations, Arnet recommends uninterruptible power supplies (UPS), power line filters, and surge protectors for every installation.

A UPS can provide protection from electrical surges and fluctuations in the power supplied to the computer. However, it does little good to protect the main‘console if you have no protection on the other devices attached to the system. Power line filters protect against electrical surges and transient spikes. Some filters even have a shutdown feature that drops power to the device if voltage drops below a preset level. This prevents the spikes and surges caused by the typical “off and on” electrical problems that occur during a thunderstorm. AC line filters should be used with all electrical devices connected to a computer system, no matter how small or simple.

The serial cables themselves present another potential danger. Nearby lightning strikes can induce high-voltage surges into RS-232 cables. Machinery, especially commercial machines with electric motors, often generates electrical noise that can be picked up by serial cables and cause data errors or equipment damage. Arnet includes "SurgeBlock" on every MultiPort. SurgeBlock clips fast-rising peak voltages to help protect against spikes over twenty-five volts caused by lightning, static, or induced voltage. For maximum protection we recommend surge suppressors on the peripheral end of all serial cables.

Cables running long distances and/or through electrically noisy areas are subject to noise pickup that can cause data errors or equipment damage. To minimize this danger, we recommend low capacitance shielded cable for all RS-232 connections.

Destructive power surges can also enter through modems via telephone connections. Filters made specifically for this purpose should be included on all telephone line connections.

Grounding Techniques

Many terminals and computers are dependent on earth ground to set a reference for signal ground. Improper grounding or differences in ground potential between your computer and terminals can damage your equipment or even create a safety hazard. Consequently, you should make sure that every component in your system is properly grounded.

Connect your computer and all terminals and other peripherals to three-pronged grounded receptacles, making sure that the receptacles are wired properly. If you must use three-prong to two-prong adapters, make sure that the adapter ground tabs are properly grounded.

Pin 1 (chassis ground) of the RS-232 data connector of your terminal is connected to the frame of the terminal or to earth ground. When you connect the data cables, make sure that the cable shield is connected to Pin 1 on the terminal side. However, in order to prevent possible ground loops, the shield must not be connected to Pin 1 (chassis ground) of the connector on the MultiPort board.

A proper chassis ground guarantees that no dangerous voltages exist on terminal frames. Proper grounding also helps cancel noise that can otherwise be induced on the frame or equipment.

Local electrical codes may also dictate special grounding arrangements. Your electrician can make sure that your installation complies with all applicable codes. If you have any doubt about the integrity of the grounding system in your location, have the system checked by a licensed electrician.

Static Protection

Your computer's case not only houses its family of computer components, but it also protects these sensitive electronic components from stray magnetic (EMI) and electrical (RFI, static) fields.

WARNING

Using proper static control methods is essential whenever you use, moue, or open your computerfor modifications.

Make sure that you are working in a static-controlled area which includes at least a conductive benchtop mat or chair mat that is electrically connected to earth ground. Conductive wrist straps in conjunction with ground cords provide extra protection when handling electronic components. Always store and/or move individual printed circuit boards in a conductive bag. Consult your local electronics or office supply distributor for static control products.

If you would like an overview of grounding and static protection theories and techniques, you can obtain a copy of Federal Information Processing Standards Publication *94: Guideline on Electrical Power of ADP Installations. This* booklet is available from the National Technical Information Service, U.S. Department of Commerce, Springfield, VA 22161 703/487-4650.

SECTION THREE

Checking Your Package Contents

After opening the shipping box, check the contents. The contents of the MultiPort are shown in Figure 1. If you ordered one of the optional packages, check the contents against Figure 2 or 3.

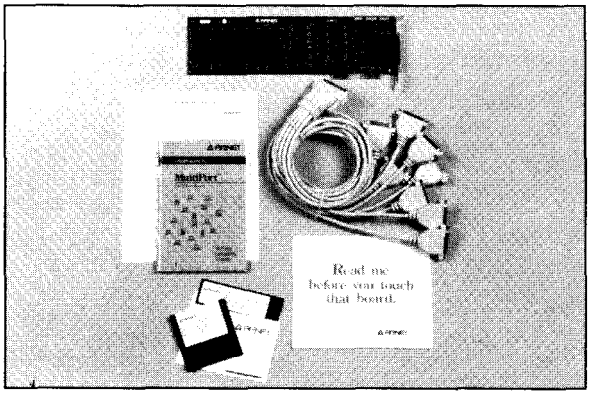
WARNING

Leave the board in its protective anti-static bag until installation. When installing or removing boards, always use adequateprecautions (such as a grounding strap) to prevent electrostatic damage.

MultiPort Contents (Figure 1):

- MultiPort board
- Cables (four or eight port connectors)
- Information packet, including
  - -User's Manual
  - -Diagnostic diskette
  - -Warranty card
  - -"Read Me Before You Touch That Board" information sheet

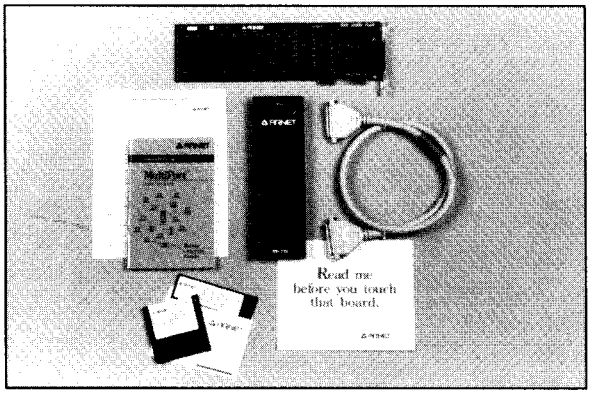
Figure 1, MultiPort contents



Eight Port with D-Sub Connector Box (Figure 2):

- MultiPort board
- One board-to-connector box cable
- One eight port, DB-25 connector box
- Information packet, including
  - -User's Manual
  - -Diagnostic diskette
  - -Warranty card
  - -"Read Me Before You Touch That Board" information sheet

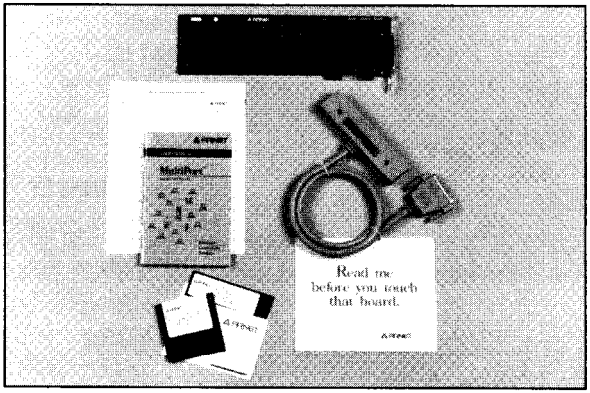
Figure 2, MultiPort contents with D-sub connector box



Eight Port with W-45 Modular Connector Block (Figure 3):

- MultiPort board
- One eight port, RJ-45 modular connector block with attached cable
- Loopback connector (not shown)
- Information packet, including
  - -User's Manual
  - -Diagnostic diskette
  - -Warranty card
  - -"Read Me Before You Touch That Board" information sheet

Figure 3, MultiPort contents with RJ-45 modular connector block



SECTION FOUR

Quick Installation Guide for ISA Computers

Read this section. If you are an experienced user, this section provides the necessary information to configure and install your MultiPort board. If you need additional information, read the detailed sections referenced.

WARNING

Leave the MultiPort in itsprotective anti-static bag until installation. When installing the board, use adequate precautions (such as a grounding wrist strap that is connected to earth ground) to prevent electrostatic damage.

1. Set the switches on the MultiPort (Section 6) as shown for your operating system in Appendix A.

2. Disconnect the power cord from the power source and remove the computer cover.

NOTE

Before installing the MultiPort, locate the PCA revision number on the board. Write the number in the space provided. You will need this number to perform diagnostics.
MultiPort/PCA revision number _____

3. Install the MultiPort board in your computer (Section 7).

4. Replace the computer cover and reconnect the power cord.

5. Connect the cable(s) you received in your MultiPort package (Section 7).

6. Connect the peripherals as described in Section 9.

7. Install the driver if necessary. (Refer to your operating system manual.)

SECTION FIVE

Quick Installation Guide for Micro Channel Computers

Read this section. If you are an experienced user, this section provides the necessary information to configure and install your MultiPort board. If you need additional information, read the detailed sections referenced.

WARNING

Leave the MultiPort in *its protective anti-static bag until installation. When installing the board, use adequate precautions (such as a grounding wrist strap that is connected to earth ground;) toprevent electrostatic damage.*

NOTE

Before installing the MultiPort, locate the PCA revision number on the board. Write the number in the space provided. You will need this number to perform diagnostics.
MultiPort/PCA revision number _____

1. Copy the @6FF0.ADF file from the Arnet Diagnostic Disk to the backup copy of your computer's reference disk.

2. Turn off your computer; disconnect the power cord from the power source and remove the computer cover.

3. Install the MultiPort board in your computer (Section 7).

4. Replace the computer cover and reconnect the power cord.

5. Connect the cable(s) you received in your MultiPort package (Section 7).

6. Root the system using the backup copy of your computer's reference disk.

7. Configure the board according to your operating system. (Refer to Section 8.)

8. Connect the cables of your peripherals to the DB-25 connectors on the connector box. (Refer to Sections 7 and 9.)

9. Install the driver if necessary. (Refer to your operating system manual or device driver manual.)

WARNING

To prevent damage to your MultiPort, never connect or disconnect the cable if the computer is plugged into the power source.

Setting the ISA **MultiPort** Switches

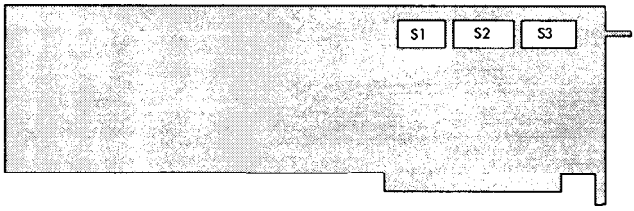
Before installing the MultiPort in your system, set the three multi-segment switches. These switches are labeled **S1**, **S2**, and **S3**. Set the three switches to match the configuration you choose via your operating system software. (Refer to Figure 4.)

S1 selects the starting address of the block of UART I/O locations which MultiPort uses. A block of 8 I/O addresses is used by each UART. The 4-port MultiPort has four UARTS totaling 32 (20H) addresses and the S-port MultiPort has eight UARTS totaling 64 (40H) addresses.

S2 selects the starting address of the block of I/O addresses for the optional interrupt latch. A block of 16(10H)I/O addresses is used.

S3 selects the system interrupt line to be used by MultiPort.

Figure 4, MultiPort switch locations



Proper Switch Settings

The flexible design of MultiPort allows many addressing and interrupt combinations. This makes it possible to use the MultiPort in a variety of systems.

Vendors of operating systems approved for use with MultiPort specify settings that work with their systems. Appendix A lists all the recommended settings that were available when this manual was printed. Two or more different combinations are usually provided; at least one should work

with your system. Refer to your operating system documentation for any additional setup information.

Appendices C, D, and E show all possible settings for the three switches. For more information, refer to the Multiport Technical Reference Manual (call Arnet Customer Support for ordering information).

NOTE

If you are installing more than one MultiPort board, refer to Appendix F, "Multiple Board Installation," before continuing.

SECTION SEVEN

Installing MultiPort

Install MultiPort into one of the 8- or 16-bit expansion slots of your computer. The following steps detail the installation procedure.

Do not install MultiPort in an ISA computer until you have set the switches as described in Section 6.

NOTE

If you are installing more than one MultiPort board, refer to Appendix F, "Multiple Board Installation," before continuing.

WARNING

Turn off power to your computer and disconnect the power cord. Inserting a board into the system with power applied could damage the system, the board, or both. Such abuse will void your warranty.

1. Remove the cover of the computer (see computer manufacturer's instructions).

2. Determine which 8- or 16-bit slot your MultiPort will occupy. Remove the hold-down screw at the top of the blank card bracket of the slot and remove the blank card bracket. The blank card bracket will not be reused.

3. Insert the MultiPort board into the mating motherboard socket. Push the board firmly into place (Figure 5).

4. Secure the board by replacing the board hold-down screw that was removed in Step 2 (Figure 6).

5. Reconnect the power cord.

Figure 5, Inserting MultiPort

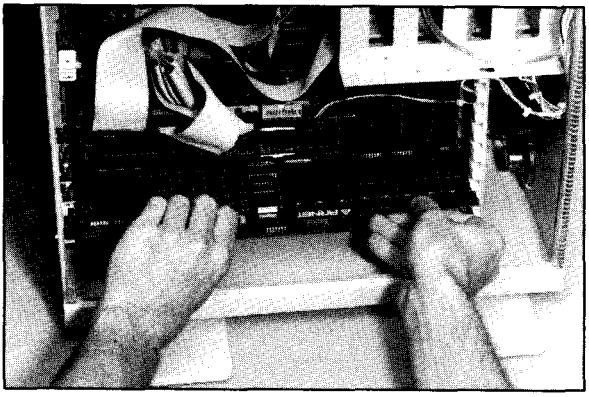
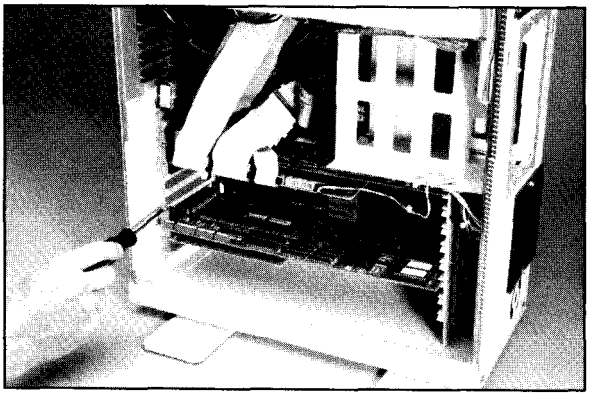


Figure 6, Repbcing the hold-down screw



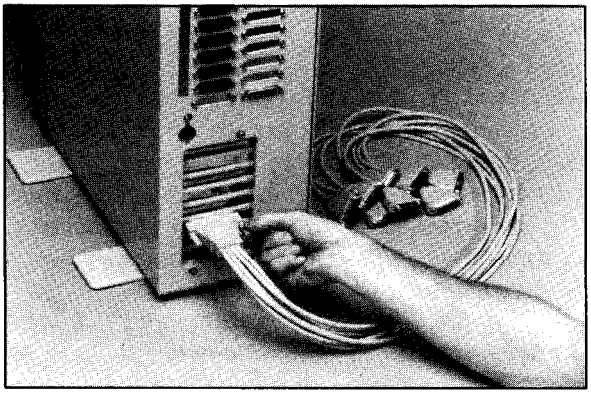
6. **Micro Channel installation only -** If you have not already done so, copy the **@6FF0.ADF** file from the Arnet Diagnostic Disk to the back-up copy of your computer's reference disk. Reboot the computer with this backup copy of the reference disk. Configure the MultiPort as described in Section 8.

7. Use the diagnostics disk to verify your installation. (Refer to Section 10.)

8. When you have verified your installation, turn off the power, unplug the power cord, and replace the computer cover.

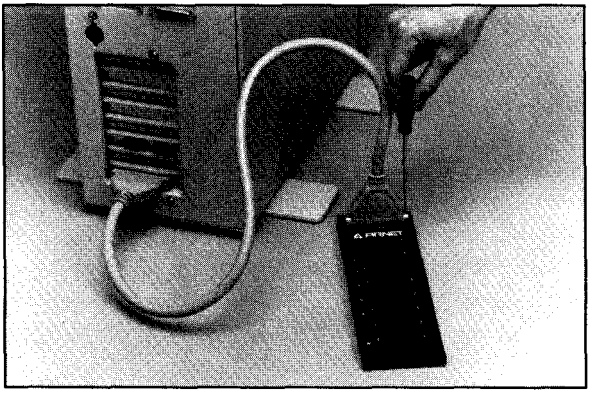
9. **If you have the standard octacable (quadracable),** attach the cable to the exposed MultiPort DB-62 connector (Figure 7) and connect the cables of your peripherals to the DB-25 connectors on the ends of the cable. (Refer to Section 9.) The port is identified on each DB-25 connector.

Figure 7, **Connecting the octacable to MultiPort**



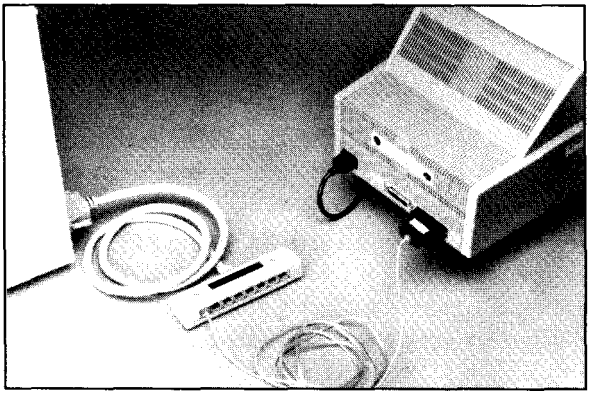
If you have the optional D-sub connector box, attach one end of the DB-62 cable to the exposed MultiPort DB-62 connector. Attach the other end of the cable to the D-sub connector box (Figure 8). Connect the cables from your peripherals to the DB-25 connectors on the connector box. (Refer to Section 9.) Each port is identified on the box.

Figure 8, Connecting the cable to the D-sub connector box



If you have the optional m-45 modular connector block, attach the cable from the connector block to the exposed MultiPort DB-62 connector. Use telephone-style modular cables to connect your peripherals to the RJ-45 modular connectors on the connector block. (Refer to Section 9.) The port is identified on each RJ-45 connector. (Use an adapter to connect the modular cables to your peripherals.) Figure 9 shows cable and adapter orientation.

Figure 9, RJ-45 cable, modular connector block, and adapter orientation



SECTION EIGHT

Configuring Micro Channel **MultiPort**

Configure the MultiPort board through your computer's Micro Channel Programmable Options Select (POS) system, using data from the Arnet Adapter Definition File (ADF) on the diagnostic diskette. This system uses hardware registers, selected and loaded through software, to assign system resources to an expansion board. Each type of expansion board has its own unique code number, assigned in conjunction with the computer manufacturer, which identifies it to the system. (If you cannot determine the proper setup information, check with operating system vendor or Arnet Customer Support.)

Refer to your computer system documentation for information on the Programmable Option Select.

1. Turn off the machine. Disconnect power and install the board as described in Section 7.

2. Reboot the computer with the backup copy of your computer system's reference diskette. The computer will show error 165 and beep twice. Continue as instructed.

3. Follow the instructions shown on the screen to select the mode necessary to manually set the configuration--do **not use the automatic configuration. (The** instructions for manual configuration will vary for computers made by different manufacturers).

4. When you are prompted to copy the new adapter files, insert the Arnet Diagnostics Diskette.

5. Press **ENTER**. The computer will read the **@6FF0.ADF** file.

6. At the prompt, remove the diagnostics disk and reinsert the reference diskette.

7. Press ENTER. The file **@6FF0.ADF** copies to the reference disk.

8. Follow the instructions shown on the screen to set or change the configuration for the Arnet MultiPort.

9. Choose your operating system and the appropriate COM channel or board number from the list. (The recommended setups given in Appendix A are all on the list.)

10. Follow the instructions to save the configuration you have chosen and to exit the program.

11. Remove the copy of the reference diskette.

NOTE

The diagnostics diskette actually contains four ADF files: @6FF0.ADF, @6FF0.AD1, @6FF0.AD2, and @6FF0.AD3. The files @6FF0.ADF and @6FF0.AD1 are identical. (This ADF file is the one that is copied to your reference diskette.) The .ADF and *.AD1 files contain the most commonly used configurations.*

The @6FF0.AD2 file contains configurations listed by operating system. The operating systems setups given *in Appendix A are contained in @6FF0.AD2.*

The @6FF0.AD3 file contains every possible option for configuration.

If you wish to use either the .AD2 or AD3 file, you must *copy the file you wish to use to the reference diskette as @6FF0.ADF. The reference diskette will copy only the .ADF file. Therefore, copy the file and rename it .ADF.*

Connecting Peripherals

The standard MultiPort quadracable or octacable has four or eight individual port connectors at the ends of the cable. Each port has a 25-pin D-subminiature female connector for attaching a peripheral.

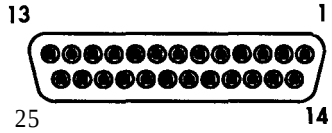
The optional RJ-45 modular connector block has eight RJ-45 modular connectors. Each port has an eight-pin RJ-45 female connector for attaching a peripheral.

Both types of MultiPort connectors provide an EIA RS-232C-like interface and serial data transmission and reception.

DB-25 Connectors and Cabling

The DB-25 connectors are compatible with RS-232 devices. Figure 10 shows the pinout and pin assignments for the standard DB-25 connectors (DTE) on the MultiPort quadracable, octacable, or D-sub connector box. (DCE pinouts are shown in Figure 11. Optional DCE connector wiring allows straight through cable and can be used when connecting terminals or printers.)

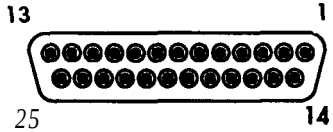
Figure 10, MultiPort DB-25 female connector (DTE) and connector pin assignments



1	Chassis Ground	
2	Transmitted Data (TXD)	output
3	Received Data (RXD)	Input
4	Request to Send (RTS)	output
5	Clear to Send (CTS)	Input
6	Data Set Ready (DSR)	input
7	Signal Ground	
8	Data Carrier Detect (DCD)	input
20	Data Terminal Ready (DTR)	output

We recommend shielded cables (30 pF or less capacitance per foot) for all installations. The FCC requires the use of shielded cables to comply with EMI/RFI emission limits. In addition, cables that run long distances or through electrically noisy areas are subject to voltage surges that can cause data errors or equipment damage.

Figure 11, MultiPort DB-25 female connector (DCE) and connector pin assignments



1	Chassis Ground	
2	Received Data (RXD)	Input
3	Transmitted Data (TXD)	output
4	Clear to Send (CTS)	Input
5	Request to Send (RTS)	output
6	Data Terminal Ready (DTR)	output
7	Signal Ground	
8	Data Carrier Detect (DCD)	Input
20	Data Set Ready (DSR)	Input

RS-232 specifies a maximum cable length of 50 feet. If you run cables farther than 50 feet, you increase the risk of surge damage and data loss. (However, using shielded cable of 10-15 pF capacitance per foot somewhat lessens the risk of data errors.

NOTE

When routing your cables, do not run themparallel to AC wiring or on *top of fluorescent light ballasts. Bundling several RS-232 cables together is acceptable.*

Your operating system probably specifies the cable configuration required for connecting terminals or modems to a computer. If so, you should follow their recommendations. If cable configuration is not specified, you can probably use one or more of the cable types discussed below. Cables for use with terminals or printers need a minimum of three wires--transmit (TXD), receive (RXD), and signal ground--plus a shield.

NOTE

Many operating systems require the use of at least one ***hardware*** *flow control signal (hardware handshaking). In this case, you will need a cable with* four *wires plus a shield. Cable wiring diagrams for this application are shown in Figures* **12** *(DTE),* 13 *(DCE), and* **14** *(DTE - modem).*

Figure 12, MultiPort (DB-25 DTE connector) to terminal or printer cable wiring with flow control

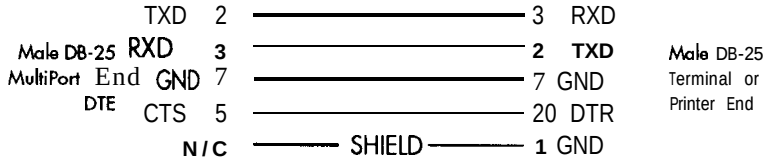
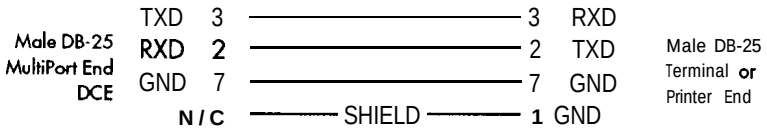


Figure 13, MultiPort (DB-25 DCE connector) to terminal or printer cable wiring with software Row control

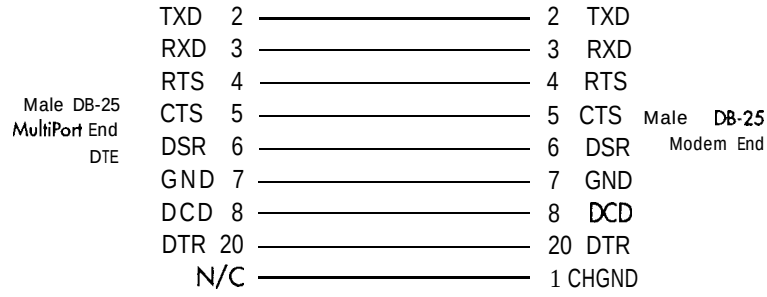


NOTE

Printer cabling may vary. Use manufacturer's recommended cable configuration.

Cables for use with modems require eight conductors plus a shield. No looping back of signals is needed for this application.

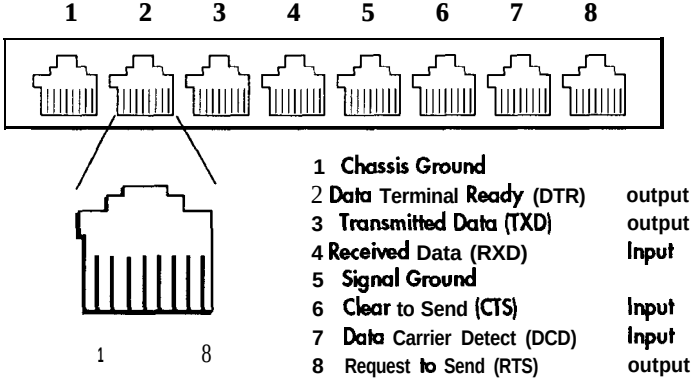
Figure 14, MultiPort (DB-25 DTE connector) to modem cable wiring



w-45 Modular Cabling and Connectors

The RJ-45 connectors are compatible with RS-232 devices. Figure 15 shows the pinout and pin assignments for the RJ-45 connectors on the MultiPort modular connector block.

Figure 15, MultiPort RJ-45 female connector and connector pin assignments



We recommend shielded cables (30 pF or less capacitance per foot) for all installations. The FCC requires the use of shielded cables to comply with EMI/RFI emission limits. In addition, cables that run long distances or through electrically noisy areas are subject to voltage surges that can cause data errors or equipment damage.

RS-232 specifies a maximum cable length of 50 feet. If you run cables farther than 50 feet, you increase the risk of surge damage and data loss.

(However, using shielded cable of 10-15 pF capacitance per foot somewhat lessens the risk of data errors.)

NOTE

When muting your cables, do not run them parallel to AC wiring or on top of fluorescent light ballasts. Bundling several RS-232 cables together is acceptable.

Your operating system probably specifies the cable configuration required for connecting terminals or modems to a computer. If so, you should follow their recommendations. Cables for use with the optional RJ-45 modular connector block are eight-conductor telephone style cables with RJ-45 plugs at each end. The cables are assembled as shown below.

Figure 16, Modular cable assembly

Modular cables require adapters for connection to the DB-25 connectors on terminals and printers or modems. Both types of adapters are available from Arnet. The internal adapter wiring for both adapters is shown in Figures 17 and 19 (Pages 28 and 29).

Note that terminal adapters and modem adapters use the same basic device (RJ-45 female to DB-25 male), but wiring connections are different. Refer to the Arnet Modular Cabling Manual for further details on wiring of modular adapters.

Figures 18 and 20 provide the cable wiring diagrams for RJ-45 connections.

Figure 17, **Arnet RJ-45 to** DB-25 (Rev. 1 CON-RJ45-049) **terminal/printer adapter with enbrged view of modubr jack pinout and internal wiring diagmm**

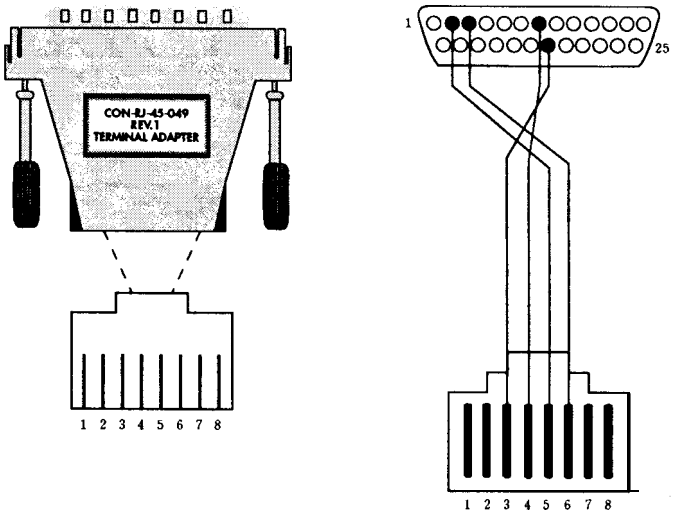


Figure 18, **MultiPort** (RJ-45 connector) to terminal or printer cable wiring with Row control

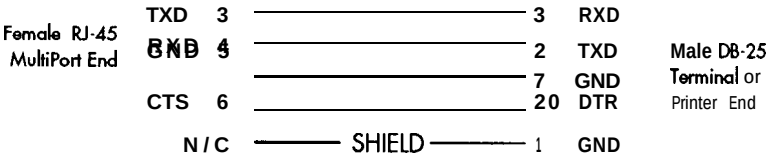


Figure 19, Arnet RJ-45 to DB-25 modem adapter (Rev.1 CON-RJ45-050) with enkrged view of jack pinout and internal wiring diimm

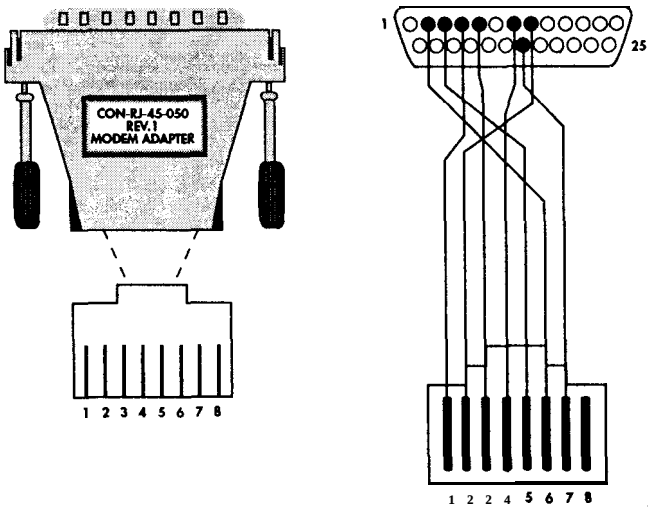
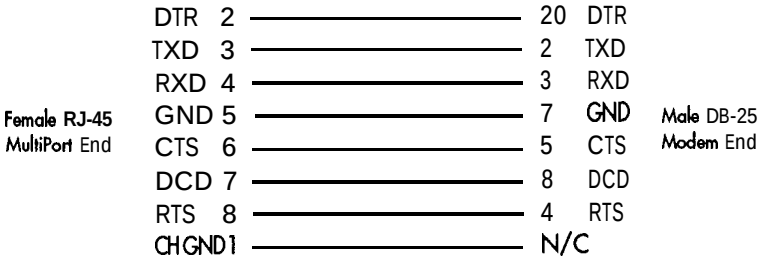


Figure 20, MultiPort (RJ-45 connector) to modem cable wiring



SECTION TEN

Using the Diagnostics Disk

The diagnostics diskette in conjunction with the loopback connector is designed to verify correct installation. **Keep this disk so that should a problem develop, you can run the diagnostics to locate the problem.** Proceed as follows:

1. With the computer off, insert the diagnostic disk into Drive A

2. Turn the power on and boot the system from the diagnostic disk.

3. When you see the introduction screen, strike any key to proceed to the main menu.

4. At the main menu, move the cursor to MultiPort and press **ENTER.**

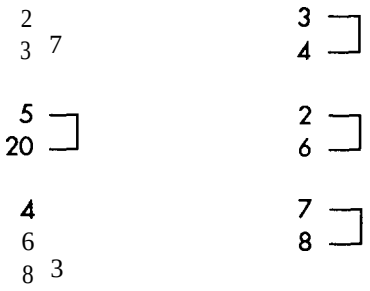
5. The next screen will show you the UART I/O address, the number of ports on your board, the Option I/O address, and the IRQ. The screen will ask you to press y if the information is correct or **n** if it is incorrect. If you press n, follow the directions on the screen to make corrections.

NOTE

If you are using *two boards, the screen will show information on only the first board. For the second board, press* ***n*** *and enter the I/O address of the second board.*

6. The next screen is the TEST menu used to test the transmit/receive function and the control signal functions of each port. If you choose INTERNAL (which puts the UARTs in internal loopback mode), the test will run automatically for each port and display the results. EXTERNAL (which tests the line drivers and receivers) will tell you how to use the loopback connector to test each port. The results for each port will be given following each port test.

Figure 21, Loopback connector wiringdiimms



The tests will tell you if there is an address or interrupt conflict. If the diagnostics cannot determine your switch settings, there is probably a conflict. In this case, try other address and/or interrupt settings. If you still cannot determine a setting, call Arnet Customer Support for assistance.

In Case of Trouble

WARNING

Make sure your computer is turned off before installing or removing *boards. Your computer must also be off to change switch settings on the boards. When installing or removing boar&, always use adequate precautions (such as a grounding strap) to prevent electrostatic damage.*

Test your MultiPort using the diagnostics disk provided. If the MultiPort passes all the tests, the problem is probably elsewhere. The symptoms of particular problems may vary between operating systems. Common problems are listed below.

Address/Interrupt Conflicts

All devices in your system must have unique addresses that must not overlap. The memory location you select with S2 must be outside the caching memory range. If you think you have a conflict problem, try the alternate settings listed for your operating system.

Inconsistent Baud Rate

The baud rate and other RS-232 parameters chosen via the operating system must be the same for the MultiPort and the peripherals connected to it.

No Handshaking Signals

Some peripheral devices may need some or all of the handshaking signals that MultiPort supports.

Incomplete or Incorrect Installation

Some operating systems require that an installation procedure be run before MultiPort is recognized. Refer to your operating system user's manual. Verify correct MultiPort hardware installation, referring to Sections 5, 6, **7** and 8 in this manual.

Improper Grounding

Make sure that every component in your system is properly grounded. Differences in ground potential between your computer and terminals can damage equipment.

If your board fails the diagnostics or you are unable to isolate the problem, call Arnet Technical Support (800-366-8844) anytime between 8 a.m. and 7 p.m. Central Time (Monday through Friday). We can give you suggestions for things to try. Please have the following information ready when you call:

Fill in information here

- Computer make _____
- Computer model number _____
- Operating system _____
- Which Arnet board you are using _____
  - Serial number _____
  - Revision number _____
- Type of hard drive in your system _____
- Type of video card in your system _____
- Type of tape backup in your system _____
- Failure symptoms
- Results of diagnostics
- Whether the board has worked before (was it installed successfully?) _____
- Dealer/store where you purchased your Arnet board _____

If You Have to Return a Board

Sometimes our boards do have problems and have to be returned for service. In this case, you'll need to call us for an RMA number. You must have an RMA number to return a board to Arnet. The RMA number must appear on the outside of the package. Before calling for the number, make sure you can answer the following questions:

1. Where did you buy your board? If you bought from a dealer, you should go through the dealer to return the board. If you bought it from Arnet, you can deal directly with us for repair.

2. What is your board's serial number, revision level number, and date of purchase?

3. Have you followed the checklist at the beginning of this section and tried all of the steps? We've found that these procedures eliminate most problems encountered during installation.

4. Have you contacted the dealer from whom you originally purchased the board for his advice and assistance?

Your Arnet board is one of the most reliable parts of your multiuser system. We back this product with the Arnet Lifetime Warranty. (Refer to Appendix H.) As a matter of fact, if you purchase a board from us and it doesn't work in your application, or if you decide not to keep it for any reason during the first 30 days, we will refund your money. But remember, we're here to help in any case-because our ultimate goal is to keep your system up and running, and to keep you a satisfied customer.

Multiuser Operating System Setups for **MultiPort**

Try primary settings first. In case of I/O address or IRQ conflicts, try alternate settings. Please refer to operating system documentation for more information.

Concurrent DOS
Novell DR Multiuser DOS
by Digital Research, Inc.

Primary Address

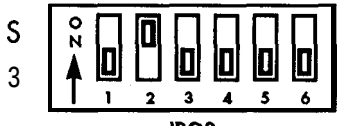
UART I/O Address:

280H

Option I/O Address:

270H

IRQ:



IRQ3

The "Setup Work stations" option of the SETUP program is used for MultiPort Configuration.

The alternate address settings are shown on the next page.

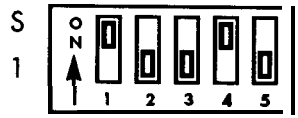
NOTE

Use the following configuration for Micro Channel MultiPort with Concurrent DOS.

UART I/O Address:	*280H*
Option I/O Address:	*120H*
IRQ:	3

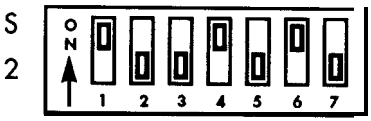
Alternate Address

UART I/O Address:



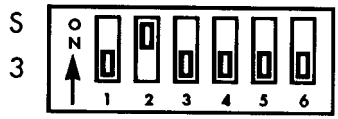
2COH

Option I/O Address:



2B0H

IRQ:



IRQ3

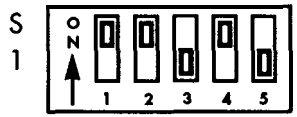
Concurrent DOS and Novell DR Multiuser DOS support one board.

Formula IV

by Dynamic Microprocessor Associates (DMA)

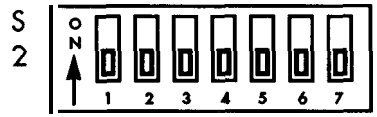
Primary Address

UART I/O Address:



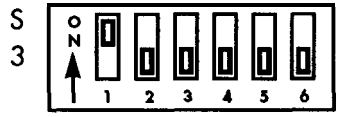
280H

Option I/O Address:



not used

IRQ:



IRQ2

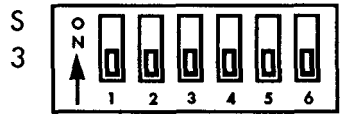
Alternate Address

UART I/O Address:

S
1

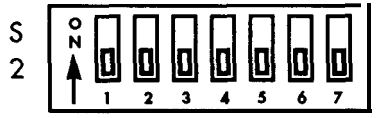
Any unused I/O area

IRQ:



not used

Option I/O Address:



not used

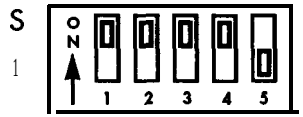
To determine if a conflict is in address or interrupt, set user **sign on** to no. When Formula comes up, if no logo appears on the terminal, check addressing and cabling. If the logo appears but the keyboard is dead, check interrupt level selection.

Refer to the blue pages of DMA documentation for further information.

SunSoft Interactive 386/ix (Version2.0)
***by Sun** Microsystems, Inc.*

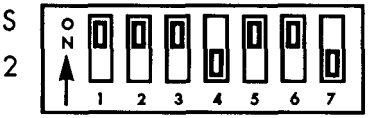
Primary Address (For use as COM2)

UART I/O Address:



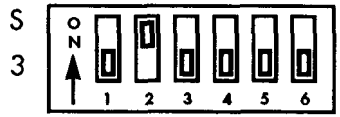
2ooH

Option I/O Address:



240H

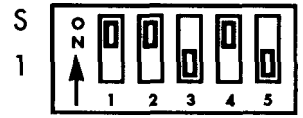
IRQ:



IRQ3

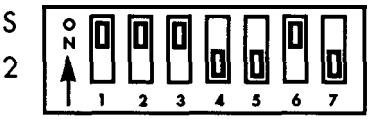
Alternate Address (For use as COM2)

UART I/O Address:



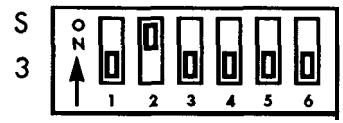
280H

Option I/O Address:



2C0H

IRQ:



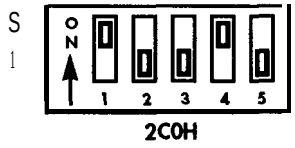
IRQ3

(Interactive 386/ix requires an Arnet supplied driver.)

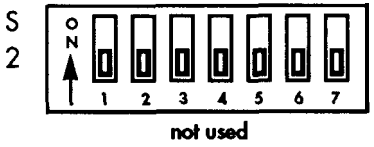
MBOS/5, BOS/LAN
by T.I.S. Software Ltd.

Primary Address

UART I/O Address:

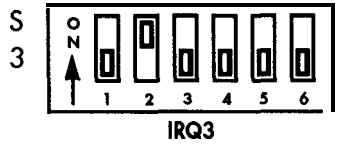


Option I/O Address:



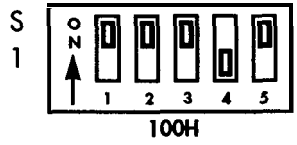
(This setting allows the last port to be COM2 under DOS.)

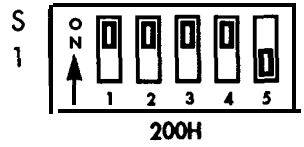
IRQ:



Alternate Address

UART I/O Address:



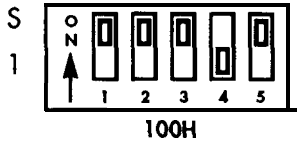


Microport UNIX

by Microport Systems, Inc.

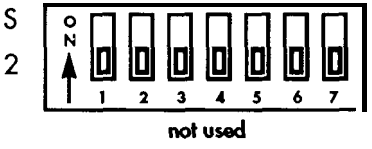
Primary Address

UART I/O Address:



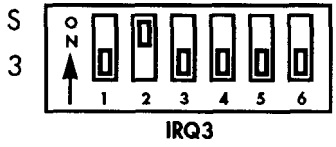
100H

Option I/O Address:



not used

IRQ:

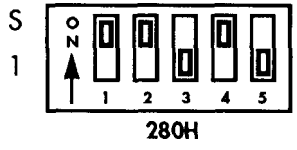


IRQ3

(IRQ3 is used by single port boards and built-in ports addressed as COM2.)

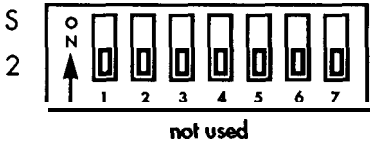
Alternate Address

UART I/O Address:



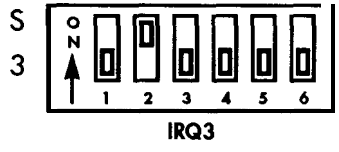
280H

Option I/O Address:



not used

IRQ:



IRQ3

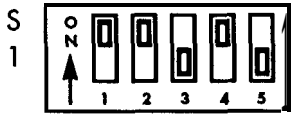
(IRQ4 is used by single port boards and built-in ports addressed as COM1.)
180H or 300H may also be used as an alternate UART I/O address.

Micronetic MUMPS

by Micronetics Design Corporation

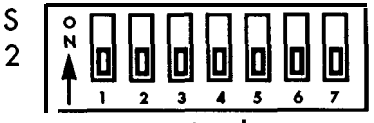
Primary Address

UART I/O Address:



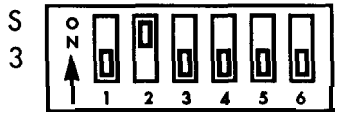
280H

Option I/O Address:



not used

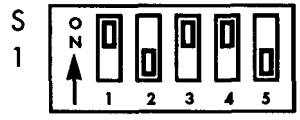
IRQ:



IRQ3

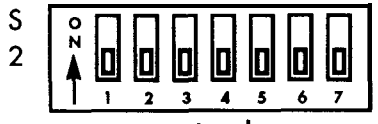
Alternate Address (or second board address)

UART I/O Address:



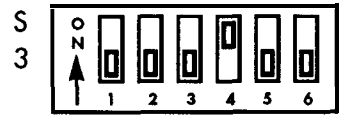
240H

Option I/O Address:



not used

IRQ:



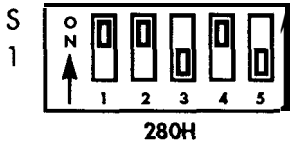
IRQ5

(Micronetics MUMPS will support two boards. If two boards are used in a system, they must share one interrupt. Refer to Appendix F.)

MUMPS *or* **CCSM MUMPS**
by DataTree *by Comp Mark*

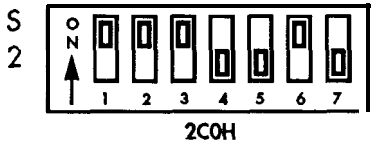
Primary Address

UART I/O Address:



280H

Option I/O Address:



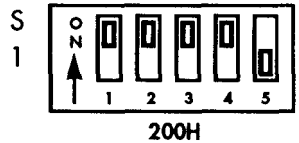
2C0H

IRQ:

IRQ3

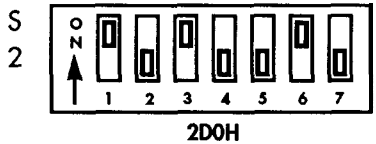
Alternate Address (or second board address)

UART I/O Address:



200H

Option I/O Address:



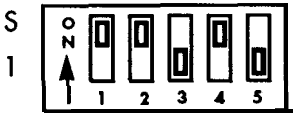
2D0H

Any available I/O addresses and IRQ selections **3** through 7 may be used provided the software file **MUMPS.HDW** and the board settings are in agreement. (MUMPS will support two boards. If two boards are used in a system, they must share one interrupt. Refer to Appendix F.)

PC-MOW386
by The Software Link

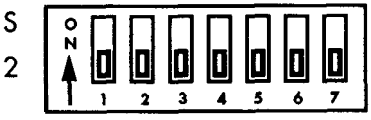
Primary Address

UART I/O Address:



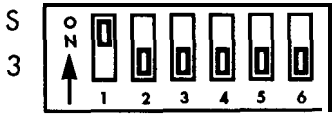
280H

Option I/O Address:



not used

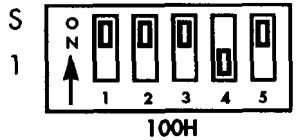
IRQ:



IRQ2

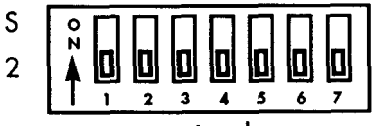
Alternate Address

UART I/O Address:



100H

Option I/O Address:



not used

Refer to the PC-MOS User's Guide for configuring the software using **$SERIAL:SYS** and **ADDTASK**. Under PC/MOS-386, the MultiPort board must use hardware handshaking.

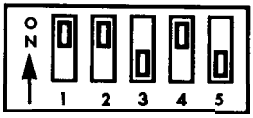
PICK

by Pick Systems

Primary Address

UART I/O Address:

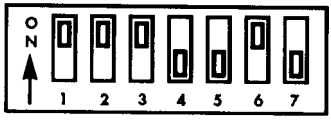
S 1



280H

Option I/O Address:

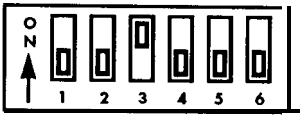
S 2



2COH

IRQ:

S 3

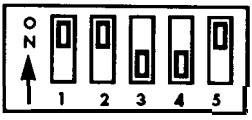


IRQ4

Alternate Address

UART I/O Address:

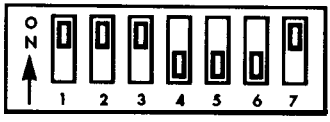
S 1



180H

Option I/O Address:

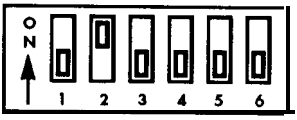
S 2



1COH

IRQ:

S 3



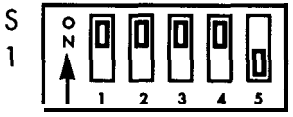
IRQ3

PICK O A
by Pick Systems

MultiPort boards used under OA can use the settings on the previous page or either of the following:

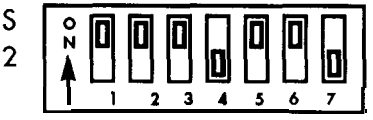
Primary Address

UART I/O Address:



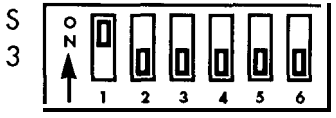
200H

Option I/O Address:



240H

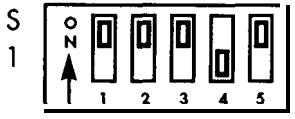
IRQ:



IRQ2

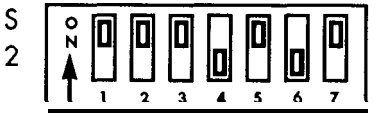
Alternate Address

UART I/O Address:



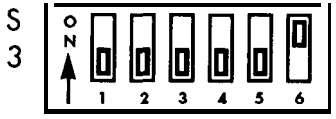
100H

Option I/O Address:



140H

IRQ:



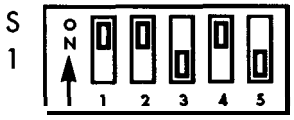
IRQ7

QNX

by Quantum

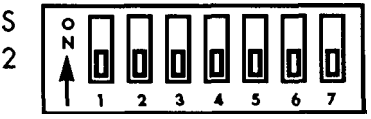
Primary Address

UART I/O Address:



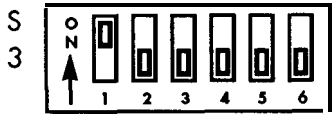
280H

Option I/O Address:



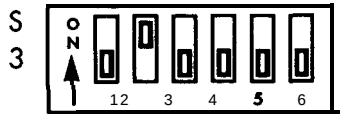
not used

IRQ:



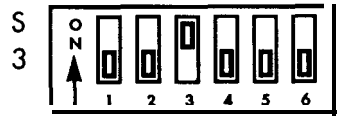
IRQ2

or



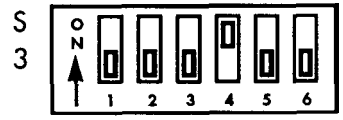
IRQ3

or



IRQ4

or

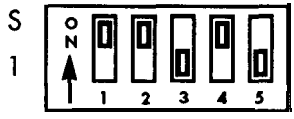


IRQ5

Quick Connect
by Virtual Systems

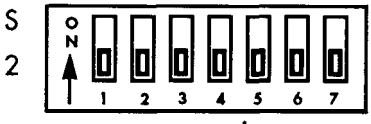
Primary Address

UART I/O Address:



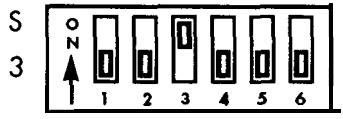
280H

Option I/O Address:



not used

IRQ:



IRQ4

See the Virtual Systems *Quick Connect Installation Guide* (Section *3.5)* for additional information.

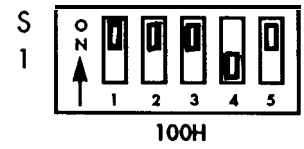
SCO XENIX System V, SCO UNIX System V

by The Santa Cruz Operation

When using MultiPort as Com1:

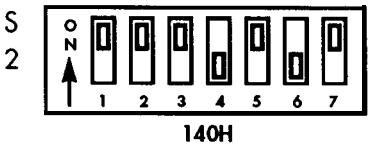
Primary Address

UART I/O Address:



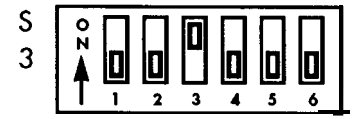
100H

Option I/O Address:



140H

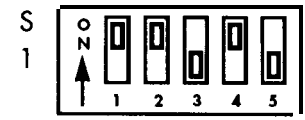
IRQ:



IRQ4

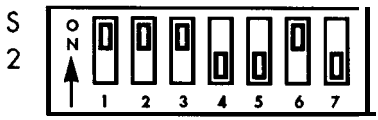
Alternate Address

UART I/O Address:



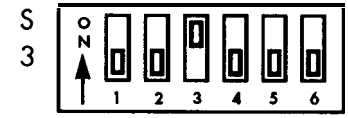
280H

Option I/O Address:



2C0H

IRQ:



IRQ4

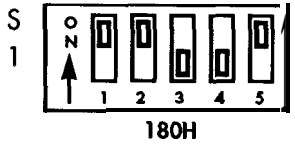
NOTE

Special information for configuring SCO XENIX and UNIX for Micro Channel MultiPort is given on Page 52.

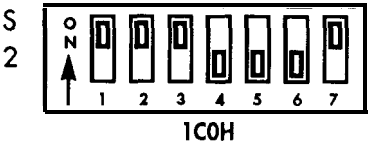
When using MultiPort as Com2:

Primary Address

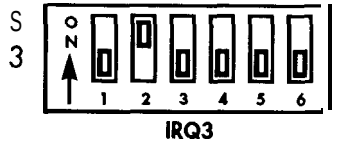
UART I/O Address:



Option I/O Address:

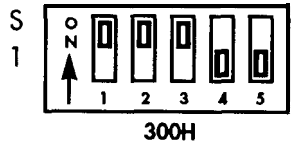


IRQ:

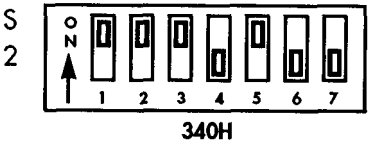


Alternate Address

UART I/O Address:



Option I/O Address:



NOTE

UART I/O address and option I/O address must both be set to primary addresses or must both be set to alternate addresses.

After installing SCO XENIX or SCO UNIX as described in the *SCO Run Time Environment Manual, log* in as the super-user. Run the program **/etc/mkdev serial** to initialize the serial ports. Enable/disable the ports as your configuration requires. A log-in message should appear on the terminals.

SCO XENIX and SCO UNIX Micro Channel Information

SCO XENIX 2.3.2 and earlier

LJART I/O Address:	140H
Option I/O Address:	Disabled
IRQ:	3

SCO XENIX 2.34 and later, and SCO UNIX

UART I/O Address:	140H
Option I/O Address:	180H
IRQ:	3

To *install the SCO driver as COM2,* **run** *the* ***mkdev serial*** *program.*

If you are installing two Micro Channel MultiPorts, you must install the Arnet MultiPort Micro Channel driver through **custom.** ***Do not run mkdev serial***. Use the following configuration:

COM3

UART I/O Address:	240H
Option I/O Address:	280H
IRQ:	3

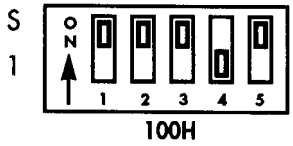
COM4

UART I/O Address:	2COH
Option I/O Address:	300H
IRQ:	3

THEOS
by THEOS Software Corporation

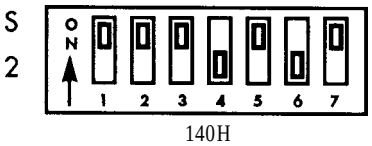
Primary Address

UART I/O Address:



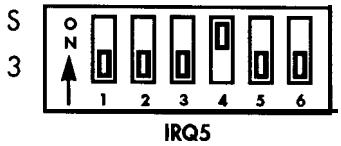
100H

Option I/O Address:



140H

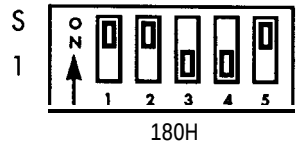
IRQ:



IRQ5

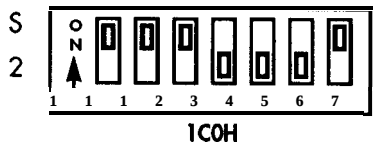
Alternate Address

UART I/O Address:



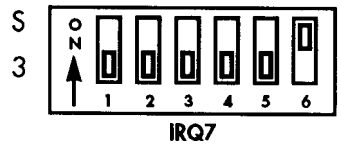
180H

Option I/O Address:



1C0H

IRQ:



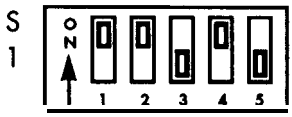
IRQ7

VENIX/86

by Unisource Software Corporation

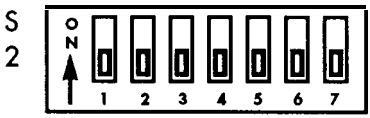
Primary Address

UART I/O Address:



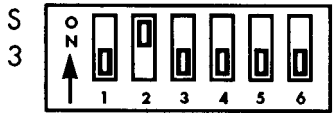
280H

Option I/O Address:



not used

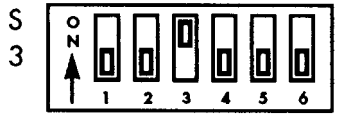
IRQ:



IRQ3

Alternate Address

IRQ:



IRQ4

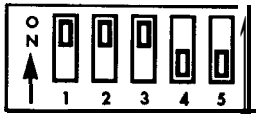
VM/386

By IGC

Primary Address:

UART I/O Address:

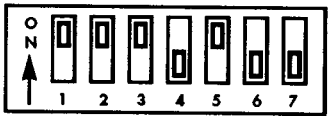
S1



300H

Option I/O Address:

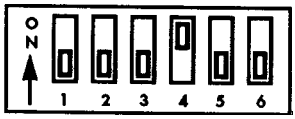
S2



340H

IRQ:

S3



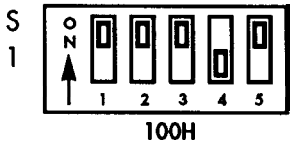
IRQ5

XMM-DOS

by Concurrent Controls, Inc.

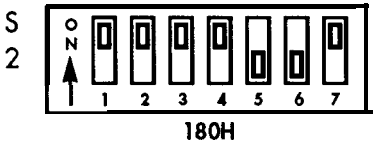
Primary Address

UART I/O Address:



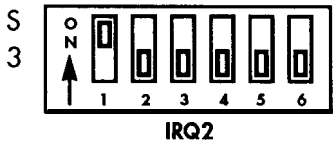
100H

Option I/O Address:



180H

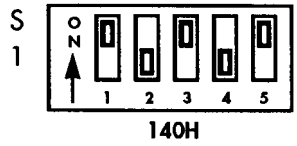
IRQ:



IRQ2

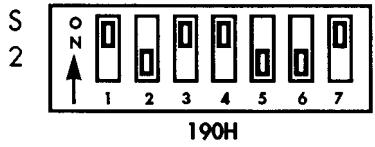
Alternate Address

UART I/O Address:



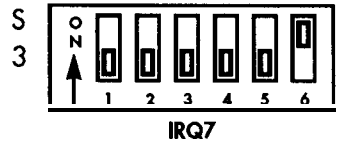
140H

Option I/O Address:



190H

IRQ:



IRQ7

The **CONFIG** utility must be used to configure XMM-DOS for MultiPort. See XMM-DOS Installation Guide, Appendix B, for **CONFIG** utility settings. After running **CONFIG**, cold boot the computer system to enable the MultiPort hardware and the new **Concurrent DOS/CONFIG** configuration.

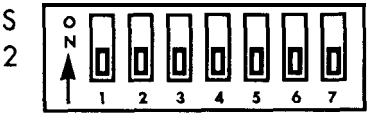
MS-DOS Setups

Primary Address

UART I/O Address:

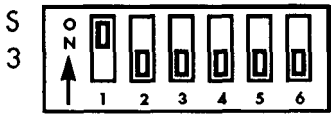
280H

Option I/O Address:



not used

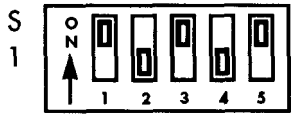
IRQ:



IRQ2

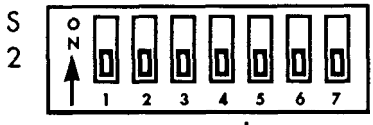
Alternate Address

UART I/O Address:



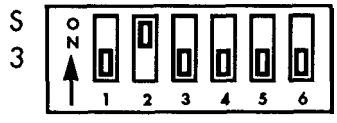
140H

Option I/O Address:



not used

IRQ:



IRQ3

Due to the large number of options often used with DOS, MultiPort address selection may become a process of elimination. Consult the installation manuals of the other expansion boards in your computer and note all known conflicting addresses. Choose from the remaining addresses to

configure MultiPort. (A good way to check the validity of an address is to run the Amet-supplied diagnostics program. If the diagnostics pass, the chosen address is valid.)

Remember that each UART uses a block of eight I/O addresses. The four-port MultiPort has four UARTs totaling 32 (20H) addresses. The eight-port MultiPort has 8 UARTS totaling 64 (40H) addresses. The switch setting is the beginning point for the addresses. The range for an I/O address setting of 280H, for example, is 280H through 2BFH. The range for an I/O address of 280Hfor the four-port MultiPort is 280H through 29FH, and the range for the same address for eight-port MultiPort is 280H through 2BFH.

The four-port MultiPort and the Arnet DOS driver also support the following UART I/O addresses in addition to the addresses shown on the previous page:

100H	1A0H	2COH
120H	1C0H	300H
160H	200H	340H
180H	2AOH	

The eight-port MultiPort and the Arnet DOS driver also support the following UART I/O addresses in addition to the primary and alternate addresses shown:

100H
180H

MultiPort and the Arnet DOS driver also support IRQ 4, 5, 6, and 7.

(Refer to Appendices C, D, and E for switch setting illustrations and to the DOS driver manual for driver installation instructions.)

APPENDIX C

Switch Settings for S1, UART I/O Address

NOTE

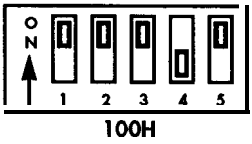
All the UART I/O addresses mentioned in this manual are in hexadecimal format. Hex numbers are noted by the letter "H" following the number, e.g., 20H.

NOTE

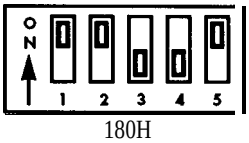
S1 selects the starting address of the block of UART I/O addresses. The I/O address you select with S1 must match the address you choose via your operating system software.

If you need switch settings for an operating system not listed in Appendix **A,** consult your dealer, the operating system supplier, or Arnet. The most commonly used settings are shown below.

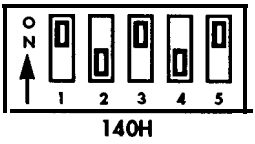
Commonly Used I/O Address Switch Settings



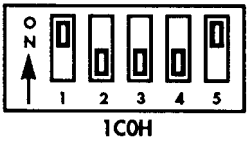
100H



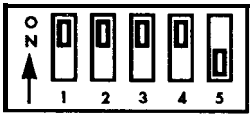
180H



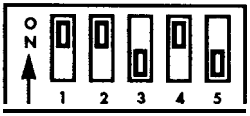
140H



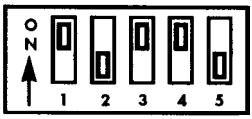
1C0H



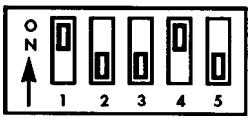
200H



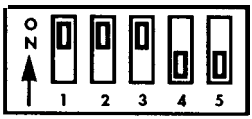
280H



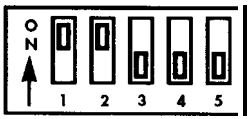
240H



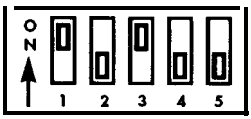
2COH



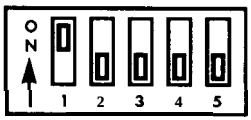
300H



380H



340H



3COH

APPENDIX D

Switch Settings for S2, Option I/O Address

NOTE

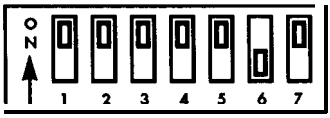
All the option I/O addresses mentioned in this manual are in hexadecimal format. Hex numbers are noted by the letter "H" following the number, e.g., 20H.

NOTE

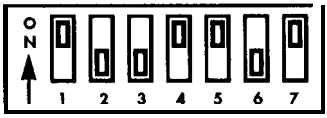
The option I/O address you select with S2 must match the address you choose via your *operating system software.*

If you need switch settings for an operating system not listed in Appendix A, consult your dealer, the operating system supplier, or Arnet. The most commonly used settings are shown below.

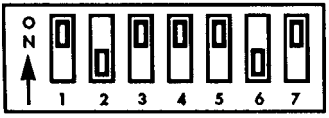
Commonly Used Option I/O Address Switch Settings



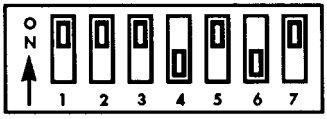
100H



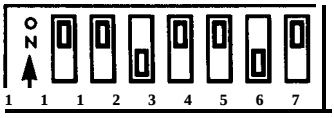
130H



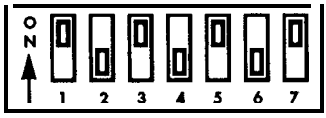
110H



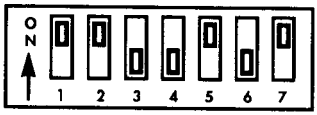
140H



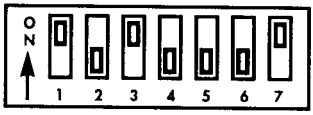
120H



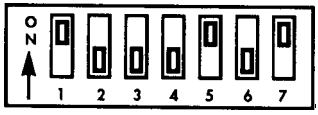
150H



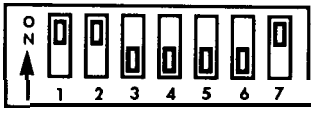
160H



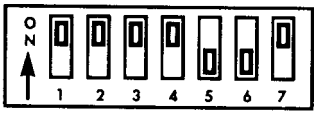
1D0H



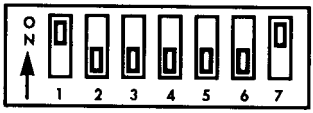
170H



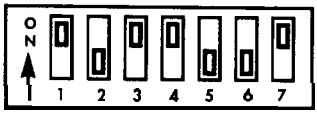
1E0H



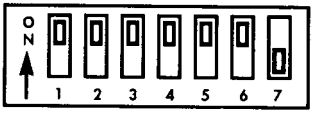
180H



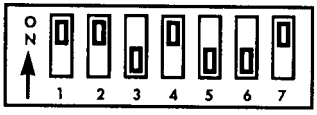
1 F0H



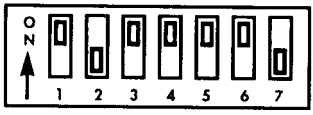
190H



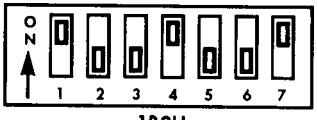
200H



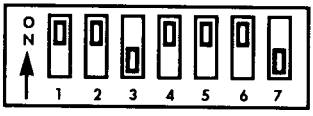
1A0H



210H



1B0H



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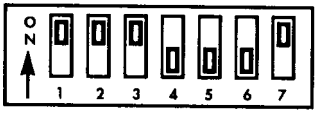

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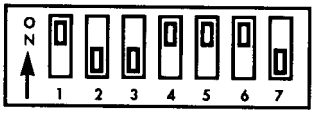

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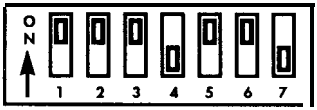

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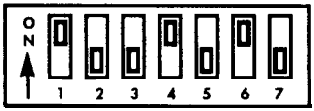

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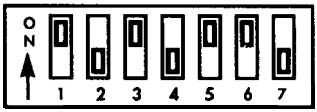

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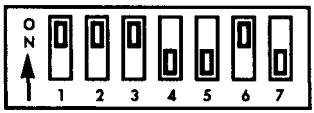

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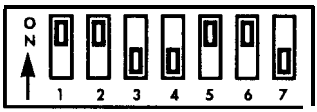

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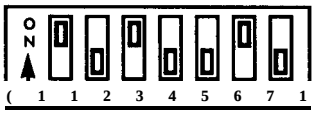

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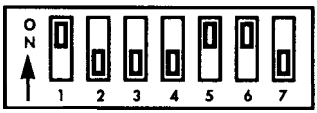

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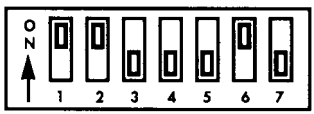

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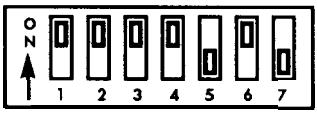

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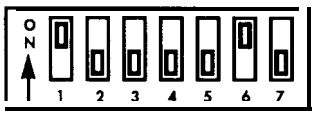

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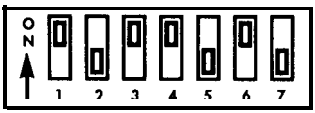

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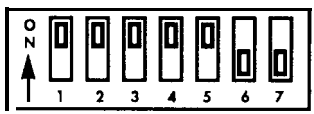

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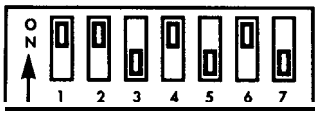

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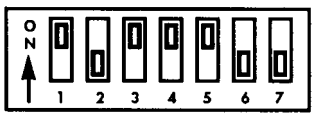

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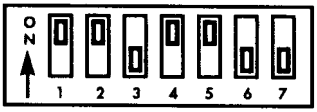

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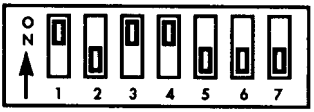

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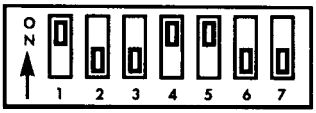

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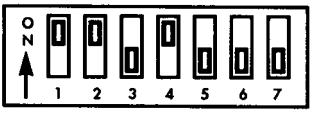

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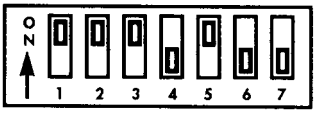

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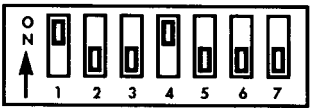

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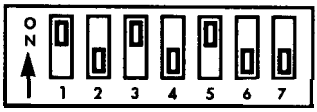

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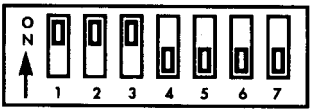

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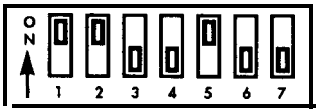

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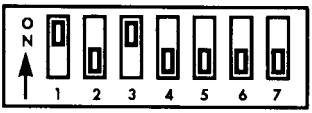

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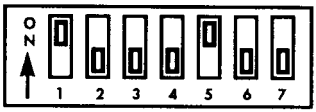

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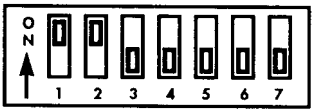

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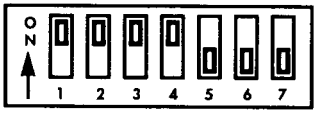

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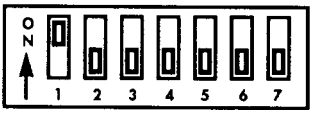


3F0H

APPENDIX E

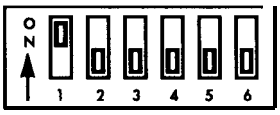
Switch Settings for S3, IRQ Selections

NOTE

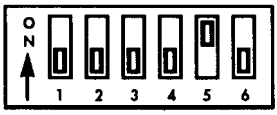
The interrupt you select with S3 must be compatible with existing system hardware and supported by your operating system software.

If you need switch settings for an operating system not listed in Appendix A, consult your dealer, the operating system supplier, or At-net. All possible settings for S3 are shown below.

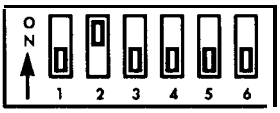
IRQ Switch Settings



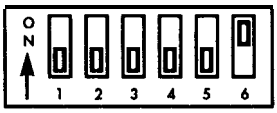
IRQ2



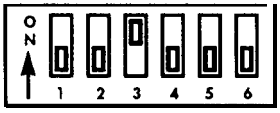
IRQ6



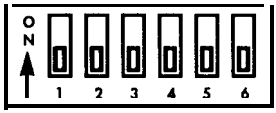
IRQ3



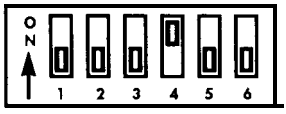
IRQ7



IRQ4



IRQ not used



IRQ5

APPENDIX F

Multiple Board Installation

If you use more than one MultiPort in a single system, each board must have a unique set of I/O addresses, and these addresses must not overlap.

Each MultiPort may use a separate interrupt or all may share a single interrupt (the operating system may specify shared or separate interrupts).

To connect multiple ISA MultiPorts to the same interrupt:

1. Locate the jumper pins next to **S1** on the MultiPort boards.

2. Remove Jumper B from the first board and attach the jumper wire to the middle jumper pin.

3. Connect the other end of this wire to pin A on the second MultiPort. Open (set to OFF) all interrupt switches on the second board (**S3-1** through **S3-6**).

4. To add a third MultiPort (under an operating system that supports more than two Arnet MultiPort boards per system), remove Jumper B from the second board and attach a jumper wire to the middle jumper pin. Attach the other end of this wire to Pin A on the third MultiPort and set S3 to OFF.

5. This connection scheme is repeated for additional MultiPort boards. Make sure that Jumper B is left in place on the last MultiPort. Use S3 on the first board to select the interrupt level for all MultiPorts in the system.

To install multiple **Micro Channel MultiPorts (SCO XENIX and UNIX only):**

You must install the Arnet Micro Channel driver through custom when installing two Micro Channel MultiPorts for SCO XENIX or UNIX. Do ***not*** run ***mkdev serial***.

APPENDIX G

Glossary

Address
A location in computer memory or I/O space. Devices and peripherals are identified to the computer by their addresses.

CTS
Clear to Send - an RS-232 control signal

DCD
Data Carrier Detect - an RS-232 control signal used with modems

DSR
Data Set Ready - an RS-232 control signal

DTR
Data Terminal Ready - an RS-232 control signal

I/O
Input/Output - describes computer ports which are used to indicate status of internal and external devices. I/O port locations are identified by addresses.

Interrupt
A signal indicating a change in device status which requires action. In MultiPort boards, these are generated by the UARTs. Interrupts are prioritized by the urgency of the action they trigger. In IBM terminology, these are known as IRQ signals (Interrupt Request).

IRQ
See Interrupt

Octacable
A serial board connection cable consisting of a male DB-62 connector with eight individual small cables attached to it, each of which terminates in a female DB-25 connector.

Port
A gateway through which data or status information is passed.

Quadracable
A serial board connecting cable consisting of a male DB-62 connector with four individual small cables attached to it, each of which terminates in a female DB-25 connector.

Receive
The connector pin which is the destination of incoming data in an RS-232 serial port.

RS-232C
The communication protocol used in MultiPort communications. RS-232-C (also called RS-232) is a serial protocol.

RTS
Request to Send - an RS-232 control signal

Serial
A type of data transfer in which data bits are transmitted one after the other on a single wire.

Transmit
The connector pin which is the source of outgoing data in an RS-232 serial port.

UART
Universal Asynchronous Receiver/Transmitter, the communication device used on all MultiPort boards. These are the same devices used by IBM for its standard serial ports.

APPENDIX H

Arnet lifetime Warranty

I. **Length** of warranty:
The Arnet Lifetime Warranty extends to the original purchaser of the product as well as all subsequent owners. The warranty is a full lifetime warranty that is in existence for the life of the computer equipment in which the Arnet product is originally installed, except for the external power supply, which receives the manufacturer's warranty.

II. What The **Warranty Will Cover:**
Any and all defects, malfunctions, or failures of the Arnet product, including electrical and mechanical components that fail, defects in software supplied with the boards, and any and all defects in material or workmanship.

III. What The **Warranty Will Not Cover:**
Defects, malfunctions or failure of any warranted product if caused by damage (not resulting from a defect or malfunction of product) while in the consumer's possession or caused by an unreasonable use of the product. Such causes may include:

(A) Damage by acts of God (such as flood, fire, etc.); damage caused by other external forces such as power line disturbances, host computer malfunction, plugging the board in under power, or incorrect cabling, and damage caused by misuse, abuse, or otherwise failing to follow instructions.

(B) Modification of any type without authorization from the Arnet Customer Support Department.

(C) Use with unapproved operating system software or computers. A list of approved operating systems and hardware can be obtained from the Arnet Customer Support Department.

(D) Use in research and development of new software products.

(E) Installation in a computer different from the unit in which it was originally installed.

IV. What Arnet Will Do Under Warranty Claims:

In the event of a defect, malfunction, or failure to perform to written specifications, Arnet at its option will repair, replace, or refund the original purchase price of the item. If a product still fails after a reasonable number of attempts to remedy the defect or malfunction, you may elect for a full refund of your purchase price. Generally, boards are repaired or replaced within two working days of receipt by the factory. For customers in the U.S., Arnet will pay shipping charges to return repaired or replacement boards via UPS ground. For customers in other countries, Arnet will pay for return shipping by standard air carrier. If you want repaired or replacement boards shipped by some other method, you must pay the shipping charges. A service fee will be charged for testing any board found by Arnet not to be defective, malfunctioning, or failed, or if the board has been damaged under the terms of Paragraph III.

V. What To Do In The Event Of A Claim:

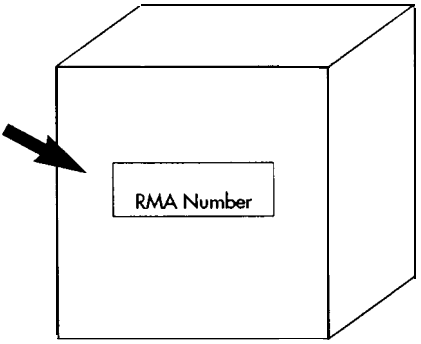
Fint, contact the *dealer from* whom you ***originallypurchased the*** *board for* ***his advice and assistance.*** Arnet dealers are authorized to perform warranty obligations. If you bought the product directly from Arnet, call Arnet Customer Support for an RMA number. Then send the unit postage paid to the following address:

Attention: Customer Support Dept.
Arnet Corporation
618 Grassmere Park Drive
Nashville, TN 37211
Telephone: ***800-366-8844;*** (615) ***834-8000***

Include the following information with the return.

- Your name and address
- Daytime telephone number
- A written explanation of the defect(s) and the circumstances under which it arose.

THE RMA NUMBER MUST APPEAR ON THE OUTSIDE OF THE PACKAGE.



VI. Disclaimer:

At-net's remedies and obligations are only to repair, replace, or refund the purchase price of the Arnet product. Arnet disclaims and shall not be liable for any incidental or consequential damages in connection with any Warranty claim and/or product defect or malfunction. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations for exclusion may not apply to you. This Warranty gives you specific legal rights and you may also have rights that vary from state to state.