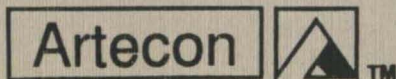*Artecon ArtePort*
SBus Serial/Parallel
Multiplexor
User's Manual

for SPARC
Workstations

Artecon, Inc.
6305 El Camino Real
Carlsbad, CA 92009-1606
(619) 931-5500

Artecon ™

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Standard Warranty Information

U.S. Customers - One Year Onsite

Artecon offers the most comprehensive warranty in our market. With over 250 service locations, every customer within a 50-mile radius of a service center receives a one year onsite warranty with every Artecon product. If you experience a problem or failure with an Artecon product, simply call our 24-hour hotline at **1-800-833-2783** or e-mail to **service@Artecon.com**. For the quickest service response, our technical support staff will try and resolve your questions directly, over the phone. If a hardware problem is discovered, a cross-ship RMA will be issued. If the problem persists, a qualified field service engineer will be dispatched free-of-charge to your site. For customers outside of the 50-mile radius of the service centers, our comprehensive one-year, best effort 24-hour cross ship warranty still applies.

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It is our intent to eventually offer the same level of customer service to our international customers that we can extend free-of-charge to our U.S. customers. For this reason, we have opened offices in Canada, Japan, and a European headquarters in France. We still offer a one-year cross ship warranty to all of our international customers. While we cannot always guarantee 24-hour shipment duty to export control and customs, we promise to do our best to get your replacement, if needed, out as quickly as possible.

Secure Customers

For customers in secure areas where return is not possible, we still offer a one-year warranty. In the case of a hardware failure, we offer a best effort 24-hour cost-based replacement. Proof of destruction of the failed unit is required. Board level replacement can be negotiated on a site-by-site basis.

Extent of Warranty

If any product is subject to federal or state consumer warranty laws, our statement of limited warranty included with the Product applies in place of these warranties. Misuse, accident, modifications, unsuitable physical or operating environment, improper maintenance by you or failure caused by a product for which we are not responsible may void these warranties. This warranty replaces any other warranty, express or implied, including the implied warranties of mechantability and fitness for a particular purpose.

Warranty Exclusions

We do not warrant uninterrupted or error free operation of any Product. Artecon provides non-Artecon Products and Services on an "AS IS" basis. However, non-Artecon manufacturers, suppliers, or publishers may provide their own warranties. All RMA equipment returned as result of a cross-ship replacement to customer is due at Artecon within 10 days. Customer is liable to pay for any product not returned within 15 days.

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Chapter 1.0 General Information

Figure 1-1. Artecon's Family of SBus ArtePort Cards

1.1   Introduction

This manual will allow you to install and use the family of ArtePort cards as shown in **Figure 1-1**. An ArtePort card is a single-width SBus card which supports from 3 to 16 RS-232 serial ports and 1 parallel port. The parallel port is available on the 300P/400P/800P/ 1200P models.

Due to the basic design, our ArtePort boards provide a LOW-COST method of attaching terminals to a SPARCstation. Our boards are not well suited to use for applications requiring a continuous stream of data. This is because each port has only 12 BYTES of buffer space and once the buffer fills up, the CPU gets an interrupt. With such a small buffer, during continuous streaming there occurs a very high number of interrupts to the CPU, which causes CPU usage to go up (thereby lowering the throughput of normal jobs). Our boards are not concentrators or servers.

Typical application the ArtePort board is well suited for:

- connecting dumb terminals (local or via modem) to a Sparc station.

The ArtePort cards conform to Sparc™ SBus design specifications. The cards enable users to interface to terminals, modems, and serial printers as well as parallel printers (except SB-1600).

.2 Features

Table 1-1. ArtePort SBus Multiplexors

Model	SB-300P	SB-400P	SB-800P	SB-1200P	SB-1600
Connector (female)	DB-25	DB-25	DB-25	DB-25	DB-25
Max. Baud Rates	38.4 Kbaud	38.4 Kbaud	38.4 Kbaud	38.4 Kbaud	38.4 Kbaud
Start/Stop Bits	1 and 2	1 and 2	1 and 2	1 and 2	1 and 2
Character Length (bits)	5, 6, 7 & 8	5, 6, 7 & 8	5, 6, 7 & 8	5, 6, 7 & 8	5, 6, 7 & 8
Parallel Port Parameters	30 Byte FIFO 20 KByte/sec Centronics	30 Byte FIFO 20 KByte/sec Centronics	30 Byte FIFO 20 KByte/sec Centronics	30 Byte FIFO 20 KByte/sec Centronics	N/A
Serial Interface Type	RS-232C	RS-232C	RS-232C	RS-232C	RS-232C
No. of Serial Ports	3	4	8	12	16
No. of Parallel Ports	1	1	1	1	0

1.3   Specifications

1.3.1   Physical Specifications

Table 1-2. Signals Supported

Models	Signals Supported
SB-300P	ttyAD-F Tx, Rx, DTR, CD
SB-400P	ttyA0-3: Tx, Rx, DTR, CD, RI, RTS, CTS, DSR
SB-800P	ttyA0-7: Tx, Rx, DTR, CD, RI,RTS, CTS, DSR
SB-1200P	ttyA0-3: Tx, Rx, DTR, CD, RI,RTS, CTS, DSR ttyA4-7: Tx, Rx, DTR, CD, RI ttyA8-b: Tx, Rx, DTR, CD
SB-1600	ttyA0-7: Tx, Rx, DTR, CD, RI ttyA8-f: Tx, Rx, DTR, CD

Table 1-3. ArtePort Card Mechanical Specifications

Width	3 inches
Length	6 inches
Weight	10 ounces

Table 1-4. Breakout Box/Cable Mechanical Specifications

Model	Box Length	Box Height	Box Width	Length of Cable
SB-300P	N/A	N/A	N/A	3.0 ft. 91.44cm
SB-400P	N/A	N/A	N/A	3.0 ft. 91.44cm
SB-800P	9.7 in 24.64cm	1 in 2.5cm	2.33 in5.92cm	4.95ft. 150.88cm
SB-1200P	13.3 in 33.78cm	1 in 2.5cm	2.33 in5.92cm	4.95ft. 150.88cm
SB-1600	16 in 40.64cm	1 in 2.5cm	2.33i n5.92cm	4.95ft. 150.88cm

Table 1-5. ArtePort Card with Breakout Box/Cable Shipping Weights

Model	Weight in Pounds
SB-300P	3.0
SB-400P	3.0
SB-800P	5.0
SB-1200P	5.0
SB-1600	5.0

Table 1-6. Environmental Specifications

Operating Temperature	0° to 50° C 32° F - 122° F
Storage Temperature	-20° to 60° C /12° F - 140° F
Relative Humidity	20% to 80% (operating, non-condensing)

.3.2   Electrical Requirements

Voltage	Amps
+5 VDC	2A
+12 VDC	30 mA
-12 VDC	30 mA

Chapter 2.0 Installation and Preparation for Use

2.1 Introduction

Chapter 2 covers getting started, ArtePort card Installation, System Interconnection/Cabling, and Powering up the ArtePort card. Installing the ArtePort software driver is necessary, but is discussed in the ArtePort Software User's Manual.

2.1.1 Shipment Contents

The ArtePort card and its required components are packaged in an anti-static bag and foam within a cardboard box. This box will contain the ArtePort card, Electro-Static Discharge (ESD) kit, Breakout Box or Cable, documentation, and a 3-1/2" floppy diskette containing the necessary software.

2.1.2 Unpacking the ArtePort card(s)

> **NOTE:** *Leave the card in its anti-static bag until you are ready to install the card. Save all packing materials in the event that the ArtePort card needs to be shipped again.*
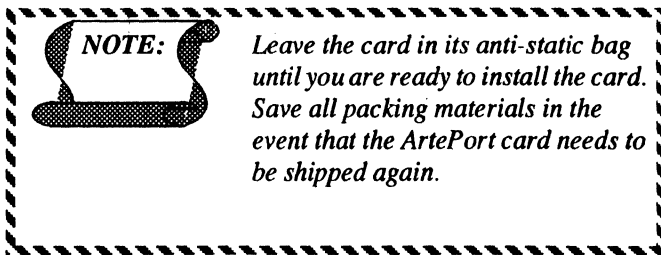
2.1.3 Inspection

Inspect the shipping box and its contents for shipping damage such as scratches, dents or cracks in any of its exterior surfaces. Check for loose or missing parts, and foreign material.

Discrepancies or damages should be reported to the shipping company. If a claim is filed for damages, the shipper may request to see the original packing materials

2.2   System Installation

This section is an explanation of system installation procedures
involved for the ArtePort card. The ArtePort card can be installed
into any standard SBus slot. SBus slots are currently available in a
variety of Sun Microsystem's SPARCstations as well as Artecon and
other third-party expansion boxes.The following is a list of
procedures to be performed:

- Powering Down a System

- Preparation of an ESD work area

- Attaching an ESD Wrist Strap

- Breakout Box Mounting Configurations

- System Interconnection/Cabling

- Powering Up the ArtePort card

Please refer to your System Installation documentation for the
specific procedures to install an SBus card.

2.1   Powering Down a System

To power down a system:

1.   Save any files you are editing. Quit all applications that
     may lose information when the system halts.

2.   As superuser,

     for SunOS 4.1.x type:

     /etc/fasthalt

     for Solaris 2.x type:

     /usr/sbin/halt

> **NOTE:** *For additional information about halting
> your SunOS 4.1.x system, refer to "Sun
> System and Network Manager's Guide".
> For information on halting your Solaris
> 2.x system, refer to "Routine System
> Administration Guide".*

3. Turn off the power to the hardware devices in this order:

    •   All external devices such as disk or tape drives (if any)

    •   System (CPU)

    •   Monitor

> *Warning:*   *Do not disconnect the power cord from the system power outlet or the wall socket. This connection provides the ground path necessary to safely remove and install the SBus and components.*

2.2.2   Preparation of an ESD Work Area

To prepare an ESD work area, perform the following:

1. Place the box containing the ArtePort card on a flat, horizontal, dry surface near your system.

2. Remove the ESD Kit from the box.
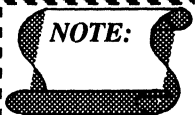
> *NOTE:*   *The ESD Kit is the plastic bag containing an ESD mat and wrist strap. These items are used to ground you and your work-surface to the system chassis. This procedure reduces the likelihood of static damage to the CMOS components on the ArtePort card.*

3. Open the plastic bag and remove the anti-static mat.

4. Place the mat next to your system.

> **NOTE:** *The mat provides an anti-static surface for installation or when you work on the ArtePort card.*
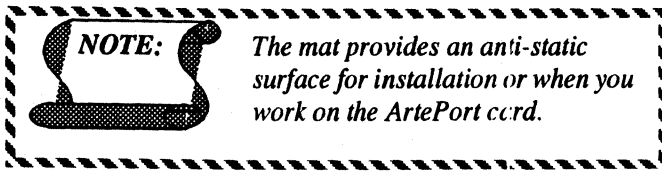
.2.2.1   Attaching an ESD Wrist Strap

The ESD Kit and its required components are packaged in a plastic bag. To use a wrist strap, perform the following:

1. With adhesive side against skin, wrap wrist strap firmly around wrist, as shown in **Figure 2-1.**

2. Unroll wrist strap and peel liner from copper strip at opposite end.
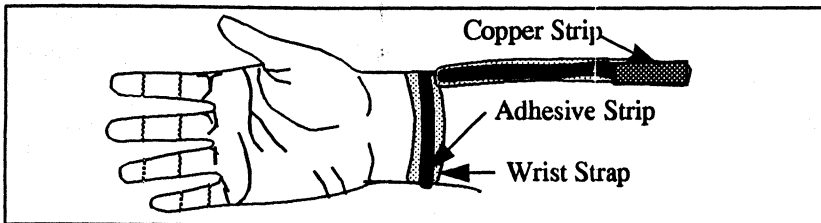
Figure 2-1. Attaching a Wrist Strap

3. Attach copper strip to a non-painted area of the chassis.

> **Warning:** *The wrist strap is used to provide grounding between your body and system chassis. The ArtePort card can be damaged by harmful electrical charges if you do not wear a wrist strap. Voltage and electrical static current do not pass through the wrist strap.*
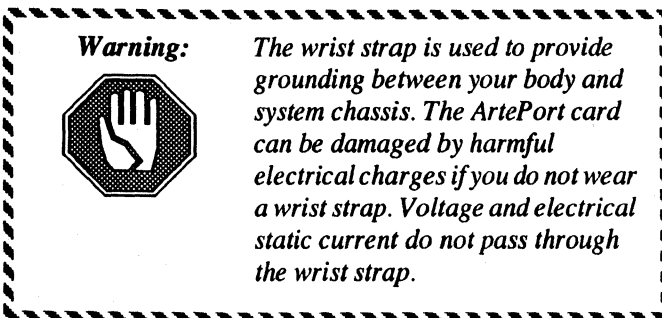
2.2.2.2   Pre-installation Check

Prior to installing ArtePort card, perform the following:

1. Place the ArtePort card on an ESD safe work area so the SBus Connector and Rear Connector both hang over an edge.

2. Firmly push in on the big square chips with your thumbs.The ArtePort card should fit snugly and neatly in place and should not be forced in to correctly install it.

2.3   Breakout Box and Breakout Cable Mounting Configurations

Each ArtePort card is shipped with either a breakout box or a breakout cable. These "breakout" devices contain the serial connectors and one parallel connector (except SB-16004). The breakout boxes are shown in **Figure 2-9** and the breakout cables are shown in
Figure 2-3. This section will discuss the breakout box, and its different mounting configurations.

Model
SB-300P
Breakout Cable

Model
SB-400P
Breakout Cable

Model
SB-800P
Breakout Cable
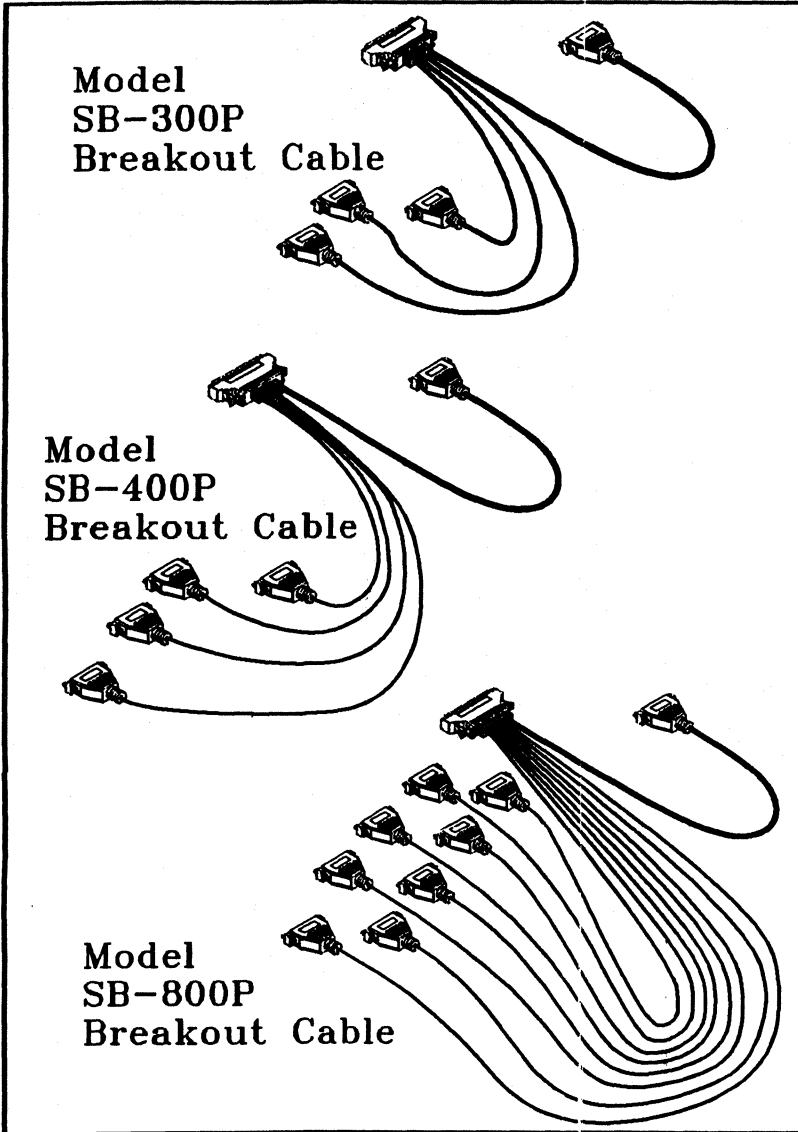
Figure 2-2. Breakout Cables
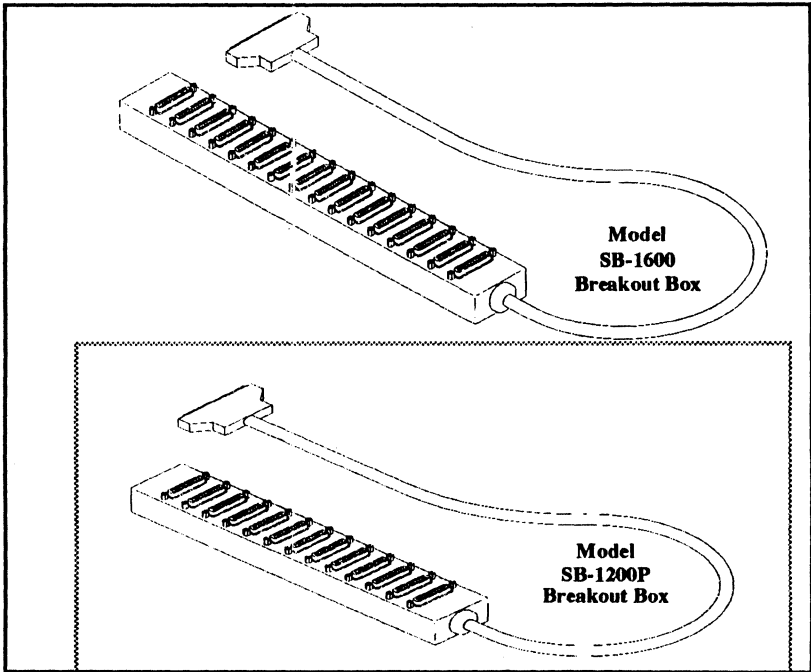
Figure 2-3. Breakout Boxes

A typical breakout box mounting configuration is shown in
Figure 2-4. The breakout box may be placed horizontally next to the
SPARCstation.
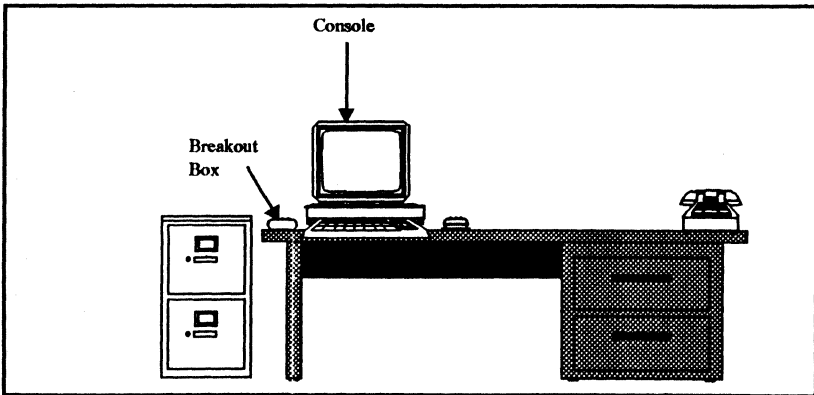
Figure 2-4. Desk-Top Mounting Configuration

The breakout box may also be mounted vertically or horizontally to any flat surface, such as a desk. Mount the breakout box as shown in **Figure 2-5**:

1. Mark two (2) holes (vertically or horizontal) where the holes will be drilled. See **Table 2-1** for appropriate dimensions.

Table 2-1. Breakout Box Mounting Specifications

Model	Distance from Keyhole Center to Keyhole Center	
SB-800P	6.7 in	170.18 mm
SB-1200P	10.3 in	261.62 mm
SB-1600	13 in	330.2 mm

2. Drill two (2) holes in the mounting surface and insert the two (2) screws in the holes and tighten. Leave a 1/4" gap between the surface and the screw head.

3. Position the breakout box against the mounting surface and align breakout box holes with mounting surface holes. The breakout box should fit snugly against the mounting surface. Adjust if necessary.
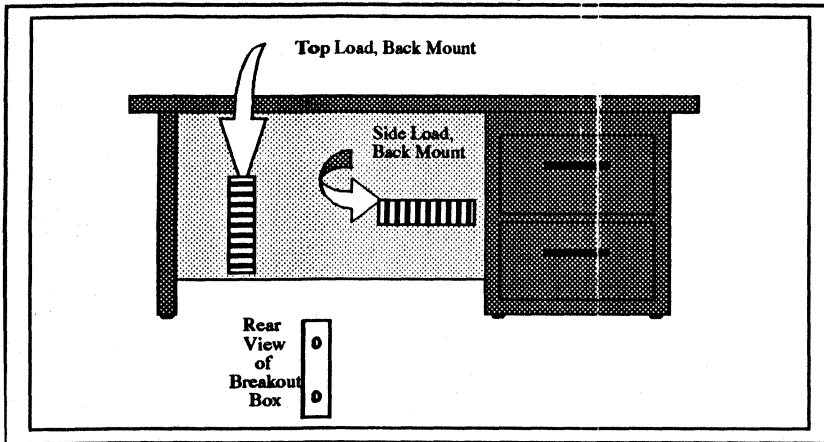
Figure 2-5. Horizontal and Vertical Mounting Configurations

2.4   System Interconnection/Cabling

The amount and type of cabling required by your system depends upon the requirements of your particular environment. This section discusses connecting an ArtePort card.

Since modems are set-up by using special escape sequences, noise on the line can trick the modem into believing that it is receiving some sort of command. This can cause the modem to "Hang" the port (this is also true for many types of terminals). Please also note that the SB-300P and SB-1600 boards are not capable of "hardware flow control (ie rts/cts)" and therefor require the use of "software flow control (ie xon/xoff)". This means that the modems CANNOT use xmodem or y-modem file transfer protocols since these protocols see xon/xoff as packet header information!

If you want to use cables longer than 50 feet, "twisted, shielded-pair" cables are recommended to minimize noise and cross-talk. Also, keep cables away from large noise sources such as Circuit Breaker Panels, drinking fountain coolers, A/C unit, copiers, large printers or any other large AC current load. If cables are in the ceiling, avoid laying them near fluorescent lights.

If you have ports that were working at a long distance (greater than 50 feet away), try the same terminal on the same port but with a short cable (ie 10-20ft). If the port works with a short cable but not the long cable, it usually means that either (or both) the terminals' driver/receiver chips or the ports' driver/receiver chips have changed their characteristics due to aging. Try using a terminal that works on a long cable and some other port on this port (to see if the terminal or the port has changed). You may want to consider buying "Null-modem" amplifiers for very long cables (greater than 100 feet).

2.4.1   Connecting an ArtePort Card

Figure 2-14 shows a typical SBus Interconnection Diagram. The figure shows a monitor, keyboard, ArtePort card, and breakout box / cable connected to a CPU. Additionally, the CPU and monitor receive AC voltage from a wall outlet

> **NOTE:** To ensure a good connection,
> tighten the small set screws on the
> connectors firmly by using a small
> flat bladed screwdriver.

Connect the ArtePort card to your system as follows:

1. Make sure the ArtePort card has been properly installed.
    Refer to *Section 2.3*.

2. Connect the breakout box/cable connector to the desired
    ArtePort card connector, as shown in **Figure 2-13**.

ArtePort Card

Breakout Box/Cable

Figure 2-6. Connecting the ArtePort Card to Breakout Box/Cable
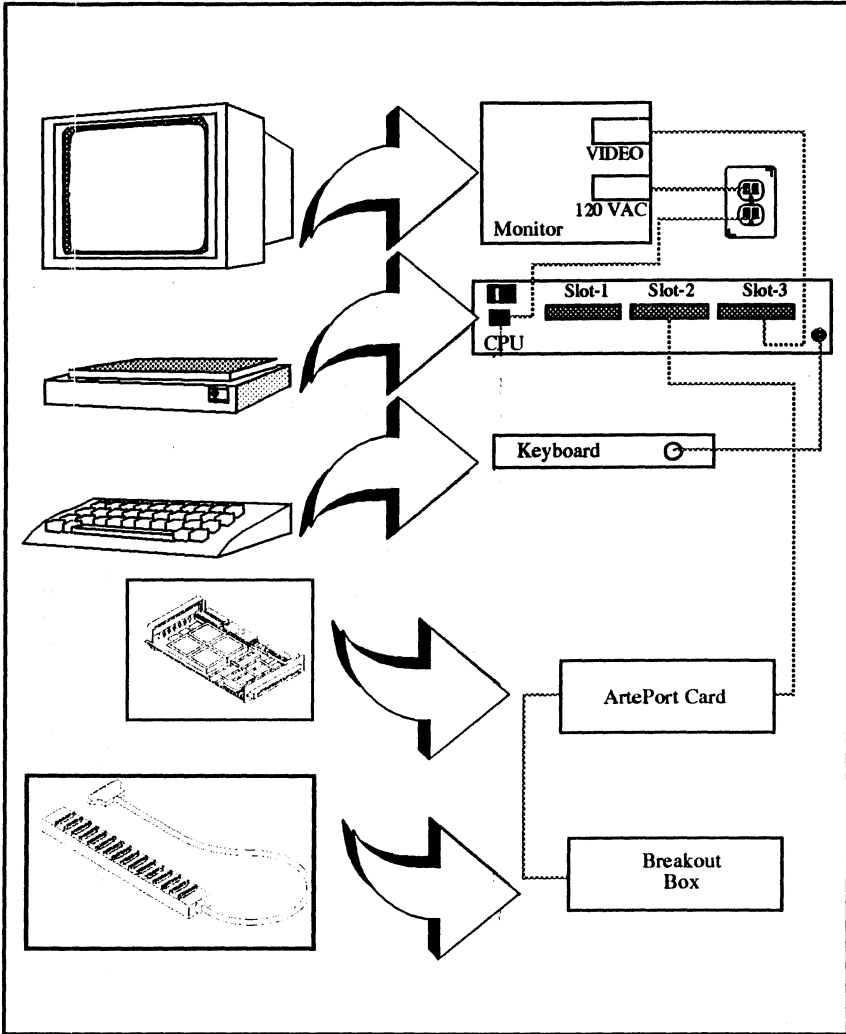
Figure 2-7. ArtePort Card Interconnection Diagram

2.4.1.1   Connecting Multiple ArtePort Cards

Installation of multiple ArtePort cards will require at least two ArtePort cards and two breakout boxes/cables, as shown in **Figure 2-16**. If this is the case, place the second ArtePort card in the next available slot. Connect the breakout box/cable to the connector. Connect the ArtePort card to your system as follows:

> *NOTE:* To ensure a good connection,
> tighten the small set screws on the
> connectors firmly by using a small
> flat bladed screwdriver.

1. Make sure the ArtePort cards have been properly installed Refer to *Section 2.3*.

2. Connect the breakout box/cable connector cables to the ArtePort card connectors.

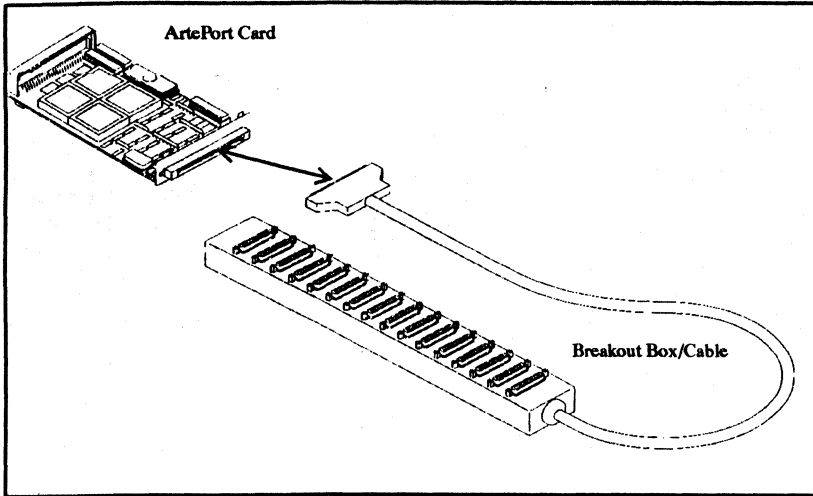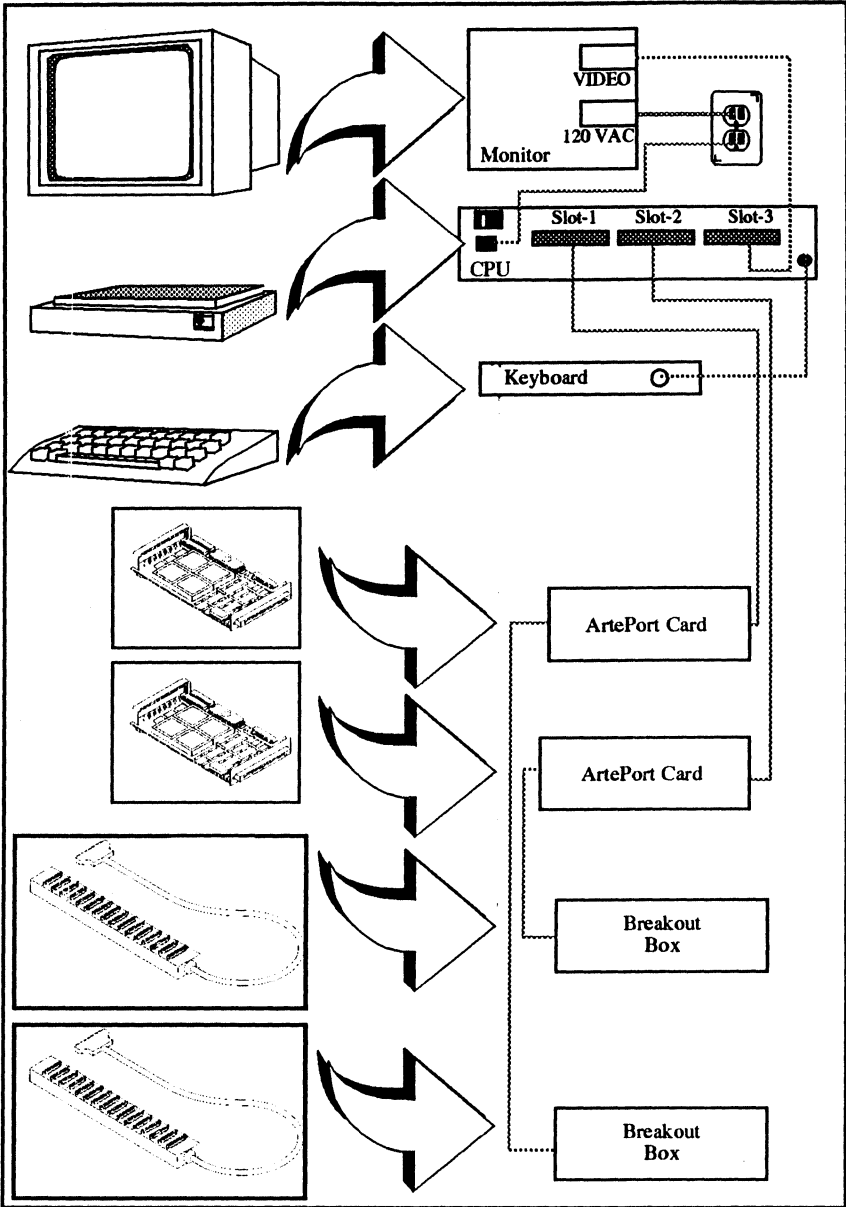**Figure 2-8. Multiple ArtePort Cards Interconnection Diagram**

Powering Up the ArtePort card(s)

> **NOTE:** *You will not have access to the ports until you have installed ArtePort Software.*
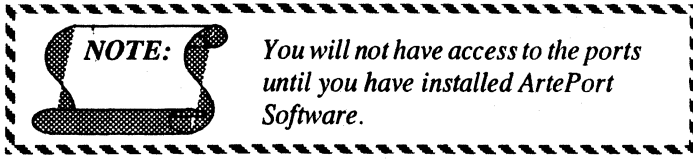
The following procedures need to be performed BEFORE powering
up the ArtePort card.

1. Ensure the switch on the rear of the system is set to the OFF
    position.

2. Verify that the correct devices have been installed into the
    system and that the devices are seated firmly in place. Also,
    make sure that the breakout boxes/cables are attached.

3. Plug the system into AC power at a convenient wall outlet.

Click the power switch on the rear of the system. Following power
up, and after the self-test is successfully completed, the following
messages are typically displayed on your monitor, as shown in
Figure 2-17:

```
SPARCstation 2, Type-4 keyboard
ROM Rev.1.3, 12 MB memory installed. Serial #59632
Ethernet address 8:0:20:a:4d:b6, Host ID:5300e8ed

Testing
Booting from sd (0,0,0) vmunix
root on sd0a fstype 4.2
Size: 1097728 + 175832 + 82448 bytes
SunOS Release 4.1.1 (EOJ) #5: Mon Jun17 15:08 PDT 1991
Copyright © 1983-90, Sun Microsystems, Inc.
mem=12288k (0xc00000)
avail mem=10874880
Ethernet address=8:0:20:a:4d:bb
cpu= Sun 4/65

.

.
login:
```

Figure 2-9. Self Test Message

Chapter 3.0 Cables for Serial Devices

3.1   Introduction

This section describes information about serial cables used to connect the ArtePort card to peripheral devices such as printers, terminals, and modems.

There are two basic types of serial cables:

- Serial Modem cables

- Null Modem cables

3.2   Serial Modem Cables

Modem cables are a type of serial cable. The modem cable may be connected to any of the ArtePort card serial ports.

In a serial modem cable, the pins in the connectors are wired "straight through." The pins function identically on the two connectors at either end of the cable.

A modem cable connects the SPARCstation to a modem. DTE and DCE devices send and receive through different pins, their signals will not "collide."

Figure 3-1 shows the wiring of a serial modem cable that enables the SPARCstation to communicate with Hayes or Hayes compatible modems.
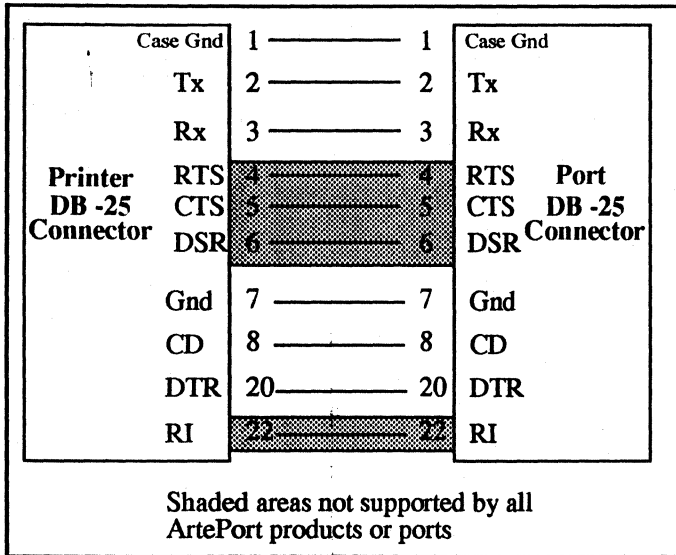
Figure 3-1. Serial Modem Cable

3.3   Null Modem Cables

Null Modem cables are another type of serial cable. The cable wires
are attached to the pins in the connectors differently than in a serial
modem cable. Serial printers and terminals typically use a null
modem cable. The cable should have a male 25-pin connector for the
breakout box/cable end. The connector at the other end of the cable
depends upon the device you are connecting to the system unit.

The serial null modem cable is designed for devices that send and
receive data on the same pins. The ArtePort card, printers and
terminals are DTE devices - all expect to send data on pin 2 and
receive data on pin 3. Because both devices are trying to send and
receive on the same wire, these wires must be crossed. If you are
making your own null modem cable, you must connect the wire from
pin 2 on the ArtePort card end of the cable to pin 3 on the device end,
and connect the wire from pin 3 on the ArtePort card end of the cable
to pin 2 on the device end, as shown in **Figure 3-2.**

A null modem cable also disables certain features of a peripheral
device by "jumpering" wires from one pin to another pin on the same
connector. **Figure 3-2** shows pins 6 and 8 jumpered and then
connected to pin 20.

> **NOTE:**   *Serial printers usually use a modified null cable.*

Case Gnd	1 ———————— 1	Case Gnd
Tx	2	Tx
Rx	3	Rx
RTS	4	RTS
CTS	5	CTS
DSR	6	DSR
Gnd	7	Gnd
CD	8	CD
DTR	20	DTR

DB-25 Connector ... DB-25 Connector

Shaded areas not supported by all
ArtePort products or ports
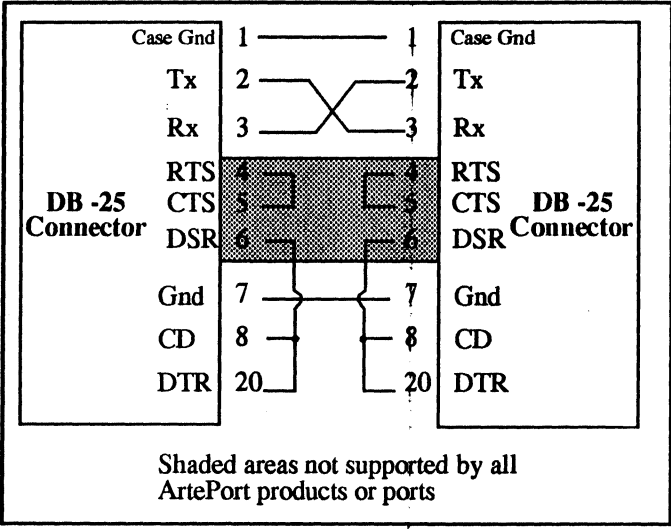
Figure 3-2. Null Modem Cable
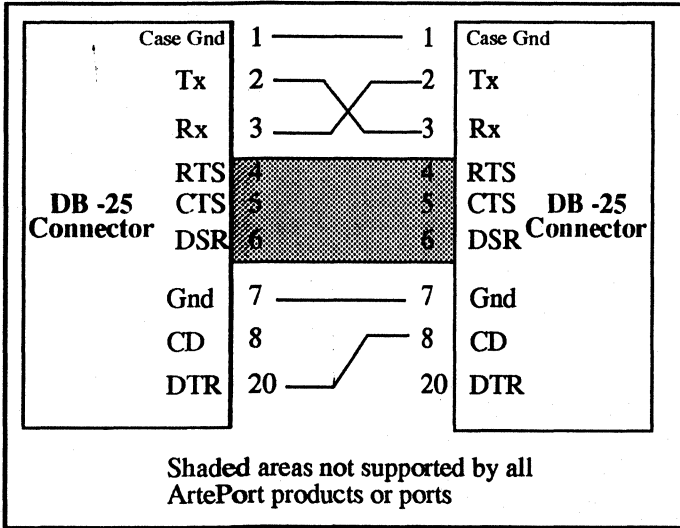
Figure 3-3. Serial Printer Cable

Chapter 4.0 Theory of Operation

4.1   Introduction

The ArtePort card interface enables you to connect from 3 to 16 RS-232 devices to your Sun SPARC workstation, while consuming only one single-width SBus Slot.

The major components of the ArtePort product include:

- ArtePort Card

- Breakout Box/Cable assembly

- ArtePort Card software driver

4.2   ArtePort Card

The ArtePort card conforms to the Sun Specification for a single-width SBus Board. The ArtePort card's SBus interface supports byte wide, slave accesses.

The ArtePort card contains an FCode EPROM, which identifies itself to the SPARC CPU. The FCode EPROM contains initialization and diagnostics which are automatically executed on power-up and reset.

As shown in **Figure 4-1**, the ArtePort card utilizes four Cirrus CL-CD1400 VLSI chips to support the sixteen serial ports. Each CD1400 supports four serial ports. The internal architecture of each CD1400 includes a RISC processor and four independent serial ports.

Each serial port maintains a 12 character transmit buffer and a 12 character receive buffer.

The overall architecture of the ArtePort card has a dedicated RISC processor for every 4 ports. This RISC processor performs character processing, and interfaces the serial ports to the SPARC, via the SBus.

Figure 4-1. SB-1600 Functional Block Diagram

The ArtePort card reduces processing demands on the SPARC system by providing:

- On chip character processing performed by the RISC processor.

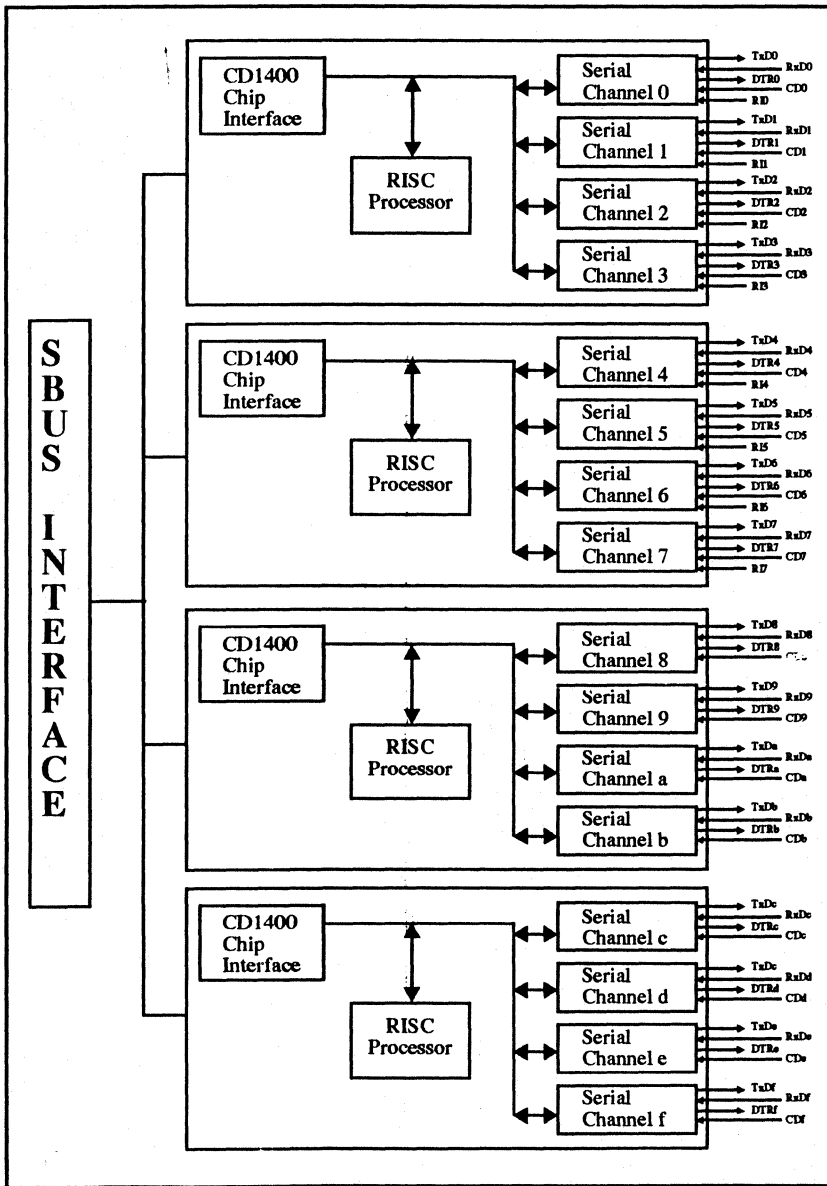- On chip character buffers for each serial port has a 12 character Transmit buffer, and a 12 character Receive Buffer.

- On chip XON/XOFF software flow control.

4.3   Breakout Box/Cable Assembly

The breakout box assembly plugs into the rear of the system. It enables eight (8), twelve (12) or sixteen (16) DB-25 connectors and one (1) parallel device to be connected to the ArtePort card (except the SB-1600). This box is supplied with a 3 ft. cable, enabling the box to be mounted on any vertical or horizontal surface near your SPARCstation.

The breakout cable assembly enables three (3) or four (4) DB-25 connectors and one (1) parallel device to be connected to the ArtePort card. Refer to ArtePort Card Installation for more information.

4.4   ArtePort Software Driver

The ArtePort Software Driver is provided on a 3-1/2" diskette. Refer to the ArtePort Software User's Manual for more information.

4.4.1   ttytool-GUI

ttytool features a graphical user interface (GUI) designed to allow the user to easily connect serial devices to a system. It gives complete control over the terminal interface and provides a terminal window to communicate with the new device. ttytool provides all the functions of the UNIX *stty(1)* command and additional features not found in *stty(1)*. The information and parameters are in a clear and easy to understand format.

If you start ttytool, get, change and apply the settings, the port will have those settings only as long as you use the tty terminal window in ttytool. If you close ttytool, the port is closed. If you save the settings (write), that file can then be incorporated into one of your programs (usually a "c" program).

The three major purposes of ttytool are:

1. To allow ease of testing/setting-up ports

2. To create a file with the desired settings for a particular port so that it is easier for you to set-up a port from within your own program.

3. An additional benefit is that it can save the parameters in a form (within a file) that can then be "imported into" the printcap file.

The ttytool gui is not necessary to setup ports for user-login. When ArtePort is installed, it modifies /etc/ttytab by appending 16 entries to the end of ttytab.These entries are all set for: std.9600 off local secure. In order to allow someone to login from a terminal, change that (or all) port entry to: on local secure. Do a kill -1 1 and if the terminal is set up properly (ie correct speed, number of data, start stop bits), the terminal should see a login prompt. If you are setting up a modem, you would change the entry to: on remote secure.

NOTE: *It is recommended that you get the port to work for a terminal before trying to setup for modem.*
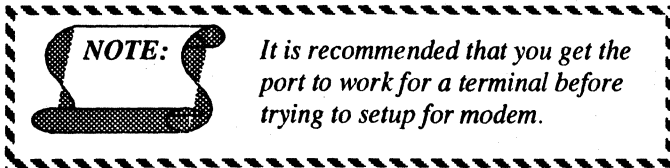
4.5   The RS-232 Signal Subset

The 96 pin connector used in the ArtePort card is the largest cost-effective connector/cable attachment available. It fits in the small external opening provided for a single-width SBus Board.

The ArtePort card design offers many useful RS-232 signals and provides a three (3), four (4), eight (8), twelve (12) or sixteen (16) Serial Port Solution.

The RS-232 specification defines 25 signals.Often, peripheral manufacturers choose reduced subsets of the RS-232 signals which suit their products. A few typical subsets include:

- Full Modem: Tx,Rx,DTR,CD,RI,RTS,CTS,DSR,Gnd

- Modem (minimum required): Tx,Rx,CD,Gnd

- Terminal (typical): Tx,Rx,CD,Gnd

- Terminal (minimum): Tx,Rx,Gnd

Most devices use only the signals TD and RD. Modems also use CD. Most flow control is done with XON/XOFF.

> **NOTE:** *With XON/XOFF, you cannot use x modem or y modem file transfer protocols.*
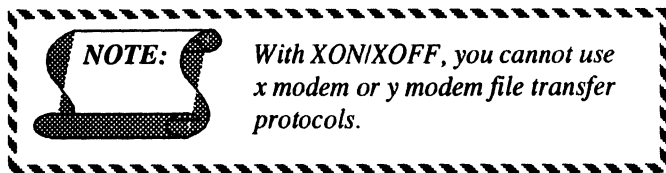
4.5.1   Signal Configuration

The ArtePort cards support many signals. Refer to Table 1-2 for signals supported.

The RS-232 'Full Modem' signals; DSR, RTS, CTS were eliminated on the 1200/1600 ArtePort cards, in order to support the larger number of Serial Ports. The following is a brief discussion for the elimination of the signals:

DSR- indicates the modem is powered on and ready. Typically, it is tied to CD or permanently set "true" by the Modem. The signal is often redundant.

RTS/CTS- implement hardware flow control. This is optional on most modems. The default for the Hayes SmartModem is RTS/CTS disabled. In practice, most serial communication uses software flow control (XON/XOFF) instead of RTS/CTS hardware flow control.

The RI (Ring Indicator) signal is not supported on ports 8-f. RI is active when the modem detects a phone ring.The signal is optional on most modems. The default setting for the Hayes 2400 SmartModem is 'Ring Indicator ignored'.

4.5.2   Parallel Port Configuration

Configuration of the parallel port is identical to the serial port. Set your /etc/printcap entry as if you were setting up a serial printer. The ms, xc, and xs printcap entries affect printer operation. Refer to the printcap(5) man page for more information.

The parallel port uses the black DB-25 connector. The pinout for this connector is shown in **Figure 4-2**. To connect a printer to your system you will need a standard PC printer cable

FPSTRB*──────────────◀──────────1
     PATFD*──────────◀──────────14
PDATA0 ────────────────◀──────────2
     PERR* ──────────▶──────────15
PDATA1 ────────────────◀──────────3
     PINIT* ──────────◀──────────16
PDATA2 ────────────────◀──────────4
     PSLIN* ──────────◀──────────17
PDATA3 ────────────────◀──────────5
     GND ──────────────────18
PDATA4 ────────────────◀──────────6
     GND ──────────────────19
PDATA5 ────────────────◀──────────7
     GND ──────────────────20
PDATA6 ────────────────◀──────────8
     GND ──────────────────21
PDATA7 ────────────────◀──────────9
     GND ──────────────────22
PACK* ──────────────────▶──────────10
     GND ──────────────────23
PBUSY ──────────────────▶──────────11
     GND ──────────────────24
PPE ────────────────────▶──────────12
     GND ──────────────────25
PSLCT ──────────────────▶──────────13

*   Indicates Low True

──────◀──────   Indicates from ArtePort Port to Printer

──────▶──────   Indicates from Printer to ArtePort Port
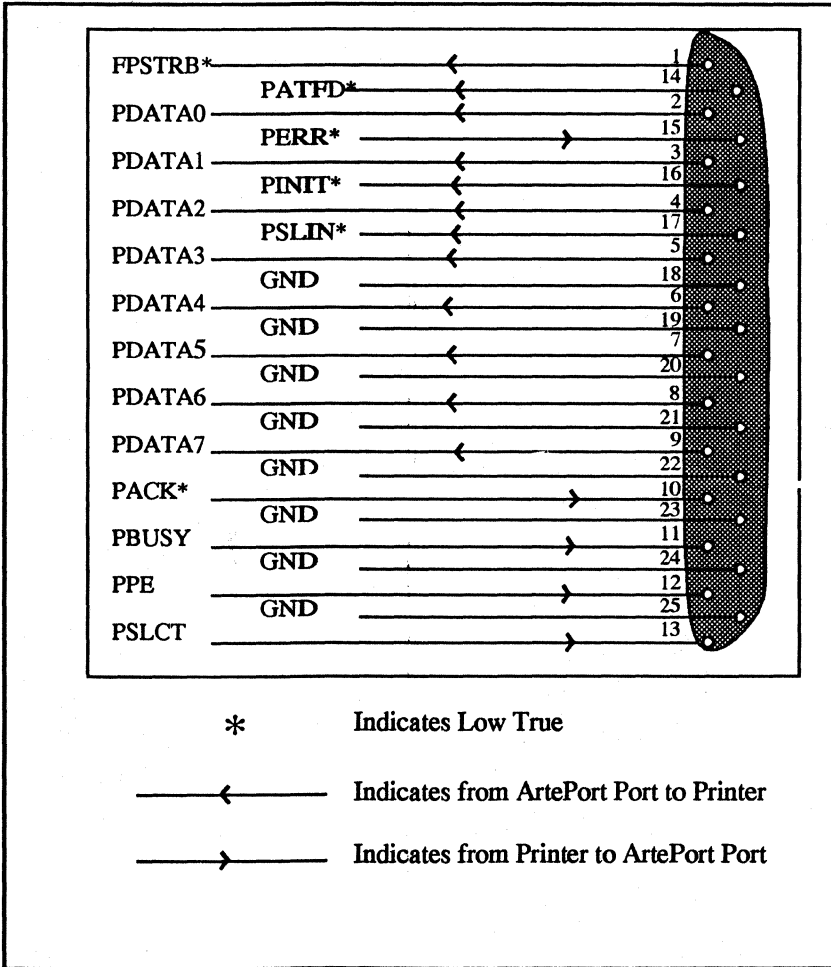
Figure 4-2. Parallel DB-25 Connector

Table 4-1. Parallel Port Pin-outs

FPSTRB	Strobe
PDATA0-7	Data Bits
PACK*	Acknowledge: Low indicates received data and is ready for more
PPE	Out of paper
PATFD*	When goes low, does a line feed after printing each line.
PBUSY	Printer busy caused by one of the following: 1. Printing 2. Off-line 3. Error 4. Form feed
PERR*	Low indicates one of the following: 1. Paper out 2. Off-line 3. Printer error
PSLCT	Indicates printer is on (since it is pulled up to 5V via 3.3K Ω resistor)
PINIT	When low, resets printer ctlr and clears printer buffer (Low going pulse > μS @ printer)
PSLIN*	Low indicates this printer is selected by CPU

Chapter 5.0 Maintenance and Trouble-Shooting

5.1 Preventative Maintenance

Procedures described below cover preventative maintenance. Repair and disassembly procedures are not covered in this manual; the reader should call their distributor or Artecon (619-931-5500, FAX: 931-5527) for assistance in repair or disassembly.

5.1.1 Operating Environment

The ArtePort card has been designed to operate in any reasonably clean, indoor location. You should not operate or store the ArtePort card outside of the ranges listed in the Specifications section in Chapter 1.

> **Warning:** *Do not expose the ArtePort card to chemical or solvent fumes (including steam). Do not remove the ArtePort card without adhering to ESD procedures. Refer to ESD Kit Instructions.*

5.1.2 Service

To maximize the performance you get out of your system, Artecon has established a worldwide network of full-support authorized Artecon distributors. If you need software updates or answers to technical questions, your Artecon distributor can help you. Artecon's technical support department backs each distributor to ensure prompt, reliable assistance.

If service is needed, call your distributor or Artecon (619-931-5500), FAX: 619-931-5527).

Artecon Service Numbers	
U.S., Canada, Puerto Rico and U.S. Virgin Islands	1-800-833-2783 Carlsbad, California.
Japan	Nihon Artecon, Ltd 033-280-1210 (in country) 81-33-280-1210 (international)
Europe	Artecon, S.A. 1-69-1818-50 (in country) 33-1-69-1818-50 (international)
Canada	Artecon Canada, Inc. 1 (416) 487-7701
World Headquarters Carlsbad, California,	1-800-USA-ARTE 1 (619) 931-5500
e-mail	service@Artecon.com sales@Artecon.com
Fax	1 (619) 931-5527

5.2   Trouble Shooting Tips

5.2.1   Problem #1: UXX not present

Situation: Message reported @ boot up

Action:

1. Push in on Cirrus chips

2. Insure correct ArtePort type selected during software install. i.e. if you have installed an 8-port board, make su e you selected 8SIP @ software install.

5.2.2   Problem #2:

Situation: No ports work

Action:

1. Check port and device parameters, i.e. baud rate, start/stop bits, etc.

2. Check for correct serial port cable-type, i.e. null modem, twist, etc.

3. Check that OS control files are set up correctly, e.g.:

    For SunOS 4.1 and 4.1.x:

    /etc/ttytab

    For Solaris 2.x

    portman

5.2.3   Problem #3:

Situation: One group of ports does not work

Action:

1. Push in on Cirrus chips.

Appendix- A

RS232 Signals

RS232 uses a 25 pin connector. Although all 25 pins are defined, only the following 10 are used for asynchronous communications, as shown in Table A.

> **NOTE:** *Not all signals are connected for all ports. For more information, refer to the ArtePort SBus Hardware User's Manual*

RS232 Signals

Pin	Signal	Description
1	GND	Protective Ground
2	TD	Transmit Data stream. Data from DTE(Computer) to DCE
3	RD	Receive Data stream. Data from DCE to DTE(Computer)
4	RTS	Request To Send. This is a signal from the DTE(Computer) to the DCE that tells the DCE that the DTE(Computer) is ready to send data.
5	CTS	Clear To Send. Signal from the DCE to the DTE(Computer), telling the DTE(Computer) that it is OK to send data.
6	DSR	Data Set Ready. Signal from the DCE to the DTE(Computer), telling the DTE(Computer) that the DCE has been turned on and is ready to communicate.
7	GND	Signal Ground. In most cases, Signal Ground (7) and Protective Ground (1) are wired together. The difference between the two is of interest only to the purist.
8	CD	Data Carrier Detect (also known as DCD). A signal from the DCE indicating that it is connected to another DCE. "Carrier" is the "I'm alive" signal sent between two modems.
20	DTR	Data Terminal Ready. Signal from the DTE(Computer) to the DCE, telling the DCE that the DTE(Computer) is on and the initialization of the communications port is complete.
22	RI	Ring Indicator. Signal from the DCE indicating that the phone is currently ringing

Notes:

Notes: