

FOR AMIGA® 2000

AND 3000 USERS

# **ioEXTENDER™**

**USER'S**

**GUIDE**





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# *IO***Extender**

A thick, black horizontal line with arrowheads at both ends, pointing left and right, positioned directly beneath the "IO Extender" text.

**High Speed  
Serial and Parallel  
Expansion  
for the  
A2000 and A3000**



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This product requires version 1.2, or later, of Kickstart. Installation of this product requires some degree of mechanical ability and precautions against electrostatic discharge. The user assumes all risks when this installation is performed by anyone other than a certified GVP dealer.

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## FCC STATEMENT

**WARNING:** This equipment has been designed to comply with the limits for a Class B computing device, pursuant to Part 15 of the Federal Communications Commission's rules. These rules and regulations are designed to provide reasonable protection against radio and television interference in a residential installation. If not installed properly, in strict accordance with the manufacturer's instructions, it may cause interference. If you suspect interference, you can test this equipment by turning it on and off. If you still experience interference with the equipment switched off, then the cause lies elsewhere. If this equipment does cause interference when switched on, any or all of the following suggestions may correct the problem.

- Reorient the antenna or plug on the radio or television receiver
- Change the relative positions of the GVP equipment and the radio or television receiver
- Plug the GVP equipment into a different outlet so that the peripheral and radio or television receiver are on different circuits.

**CAUTION:** Only equipment with shield-grounded cables (computer input-output devices, terminals, printers, etc.), certified to comply with Class B limits, can be attached to this device. Operation with non-certified equipment may result in communications interference.

Your house AC wall receptacle must be a three-pronged type (AC grounded). If not, contact an electrician to install the proper receptacle. If a multi-receptacle switch box or "power strip" is used to connect the computer and GVP peripherals to AC, then all receptacles must share a common ground.

If necessary, contact your dealer or an experienced radio-TV technician for additional suggestions. You may find the following FCC booklet helpful: "How to Identify and Resolve Radio-TV Interference Problems." The booklet is available from the U.S. Government Printing Office, Washington, D.C. 20402, stock no. 004-000-00345-4.



## CHAPTER 1.

# **INTRODUCTION**

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We, at GVP, appreciate your purchase of the IOExtender. Over the years, many Amiga users have expressed their frustration at the limited availability of outside-world communications ports that seemed to hamper their creativity. At GVP, we listen to those concerns. We're certain you'll appreciate the added flexibility that the IOExtender system will bring to you.

This user's guide is designed to make it as quick and easy as possible for you to install, set-up, and use up to five IOExtender boards. And, if you already own, or plan to purchase, a GVP A2000 G-Force '040 accelerator, you'll see how that product and the IOExtender complement each other.

Whatever your serial, parallel or other connection requirements, the GVP IOExtender gives your Amiga A2000 or A3000 the flexibility it needs in today's competitive marketplace.

## **PRODUCT OVERVIEW**

Each GVP IOExtender board features 2 high speed, multi-function serial ports and 1 parallel port for all your current and future needs. With the IOExtender, your connection possibilities are virtually endless:

- Mix and match a full range of peripherals all at the same time (*e.g., modem; printer; and—with the optional MIDI interface—music synthesizers*)
- Leave your built-in Amiga ports free for other uses

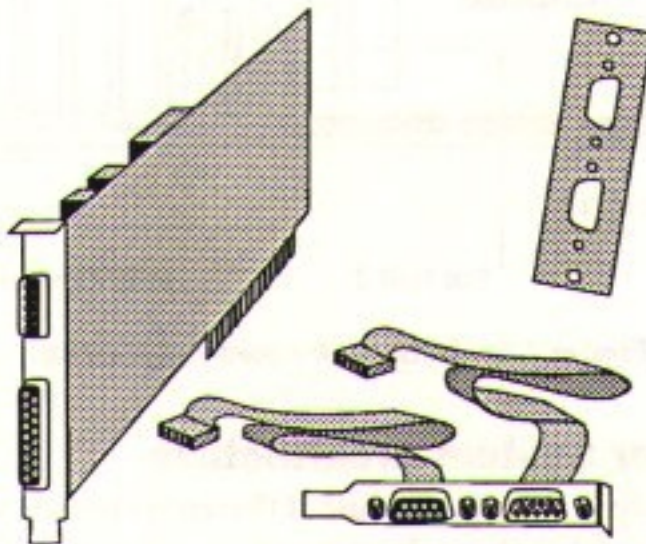


- Each RS-232 compliant serial port has its own 16 byte receive and transmit buffers, eliminating the data loss associated with the Amiga's own serial port
- Serial port communication speeds in all popular baud rates —plus MIDI and custom settings.
- Industry standard PC AT-style, DB-9 serial connectors
- Bi-directional parallel port (*DB-25*) can be configured as electrically identical to an Amiga's or PC compatible's
  - The Amiga parallel port uses one pin to send power to peripherals
  - PC compatibles use this pin for data.
- When properly configured, the parallel port supports most existing video digitizers, scanners, sound samplers and printers
- Optional MIDI expansion unit provides 2 complete 16 channel MIDI buses. Each bus has the following 5-pin DIN connectors:
  - 1 IN connector
  - 3 OUT connectors
  - 1 THRU connector
- Software switchable option connector for future expansion
- The IOExtender Board's easy-to-use software affords complete control at all times over which connections are in use

## IOExtender Basic Hardware

Each IOExtender has two connection ports mounted on the back end of the board. These connectors—the parallel port and one of the serial ports—extend out the Amiga's rear panel.

The second serial port and a connection port for the optional MIDI expansion unit are mounted on an additional rear slot cover bracket and attach to the IOExtender board with ribbon cables. We also provide a rear CPU slot cover plate in the event you choose to mount these additional ports in one of the two CPU expansion slot positions.



*Figure 1.1 – IOExtender with external ports and bracket.*

Complete details on how to attach and install these options will be provided in *Chapter 2 – Getting Started*.

**NOTES:** The IOExtender has two serial channels, each of which may be used for MIDI OR RS-232 communications. Although a single channel may not serve as RS-232 and MIDI simultaneously, you can use one channel for MIDI, while the other is used for RS-232.

The MIDI option connector is not a MIDI standard DIN connector. It is intended for use only with our MIDI expansion unit, which provides numerous DIN connection possibilities.





The IOExtender's ports are assigned as follows:

Serial Unit 0 – a 9-pin male connector on IOExtender board

Serial Unit 1 – a 9-pin male connector on extension bracket

Parallel Unit 0 – a 25-pin connector on IOExtender board

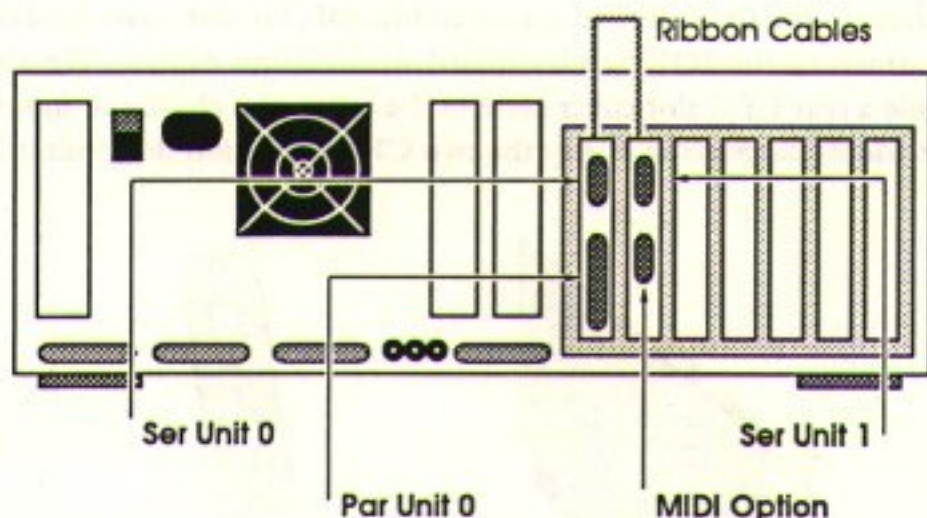
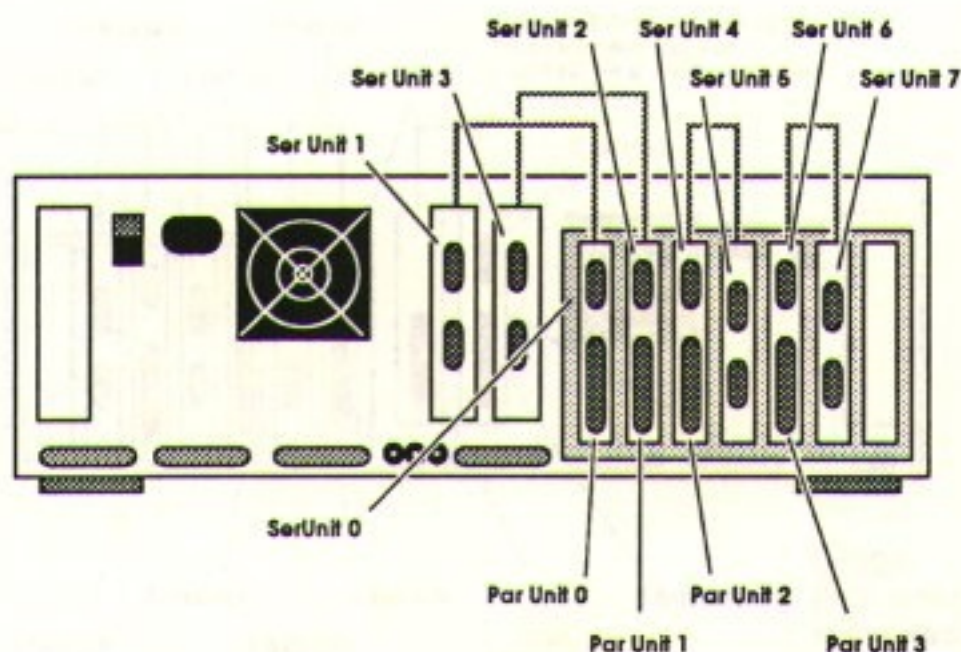


Figure 1.2 – IOExtender port assignments.

## IOExtender System Architecture

You may purchase and use as many IOExtender boards as you have free Zorro expansion slots. In all cases, your access to and control over the numerous available serial and parallel communications ports will be controllable through the same consistent software interface.

Each port is assigned a unique ID number so that it can be individually addressed by your applications software. These numbers are allocated by counting “down” the expansion bus: Parallel 0, Parallel 1, Parallel 2, etc. Figure 1.3 illustrates an extreme example of how this is done.



*Figure 1.3 – Port assignments of multiple IOExtender boards.*

Note that, in this example, the external port brackets for the first two IOExtender boards have been mounted in the CPU slot cover locations. Doing so permits more IOExtenders to be installed into the Zorro expansion slots. You may, alternately, choose to install several IOExtender boards side-by-side and carry all of their external port brackets over to the A2000's PC bus slot covers (as illustrated in Figure 1.4).

GVP's A2000 G-Force '040 accelerator offers its own additional serial and parallel ports consistent with the IOExtender system architecture and port control software. In this case, the parallel port on the G-Force '040 board is assigned as Parallel Unit 0 and its serial port is Serial Unit 0. The A2000 G-Force '040 accelerator does not have a second serial port, so the designator Serial Unit 1 is reserved and will not be used. This configuration is illustrated in Figure 1.4.



NOTE: The A2000 G-Force '040 has just one serial port. Therefore, there is no GVPser1:

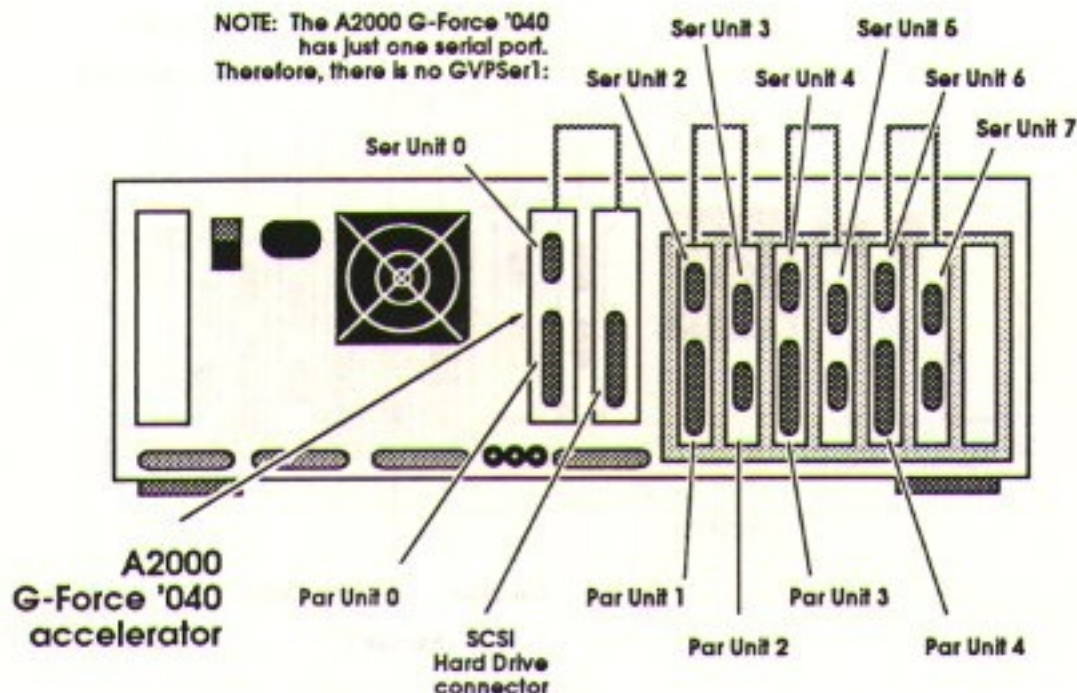


Figure 1.4 - Port assignments of G-Force accelerator and multiple IOExtender boards.

## IOExtender Uses

There are many different kinds of applications for IOExtender. The following table lists some of the possibilities:

**TABLE 1.1**  
**POTENTIAL IOEXTENDER USES**

### Parallel:

Printers  
Scanners  
Floptical drives  
Networks  
Video digitizers  
Audio digitizers  
Data acquisition  
Industrial process control

### Serial:

Modems  
Edit controllers  
Serial mice  
Plotters  
Vinyl cutters  
Data acquisition  
Consumer electronics  
Machine tools

Networks  
Laserdisc control  
Digitizing tablet  
Automated systems  
control  
Laboratory equipment



## Software Compatibility

The Amiga operating system assumes that there is just one serial port and one parallel port. Direct access to these two ports on a hardware level is normally reserved to the multitasking kernel of the Amiga's operating system. Applications software is supposed to use high-level system calls to receive or transmit through the Amiga parallel and serial ports; either through a logical device name (SER: PAR: PRT:), or a device driver (serial.device parallel.device). Applications that directly access the port hardware will not be compatible with IOExtender.

The IOExtender's added ports will be most immediately useful to programs—such as BBS systems, telecommunications software, and print spoolers—that can be configured to access them. There are three different ways that your software can make use of the IOExtender's ports. The preferred method involves reconfiguring the program itself. Many telecommunications programs, for instance, allow you to specify the name and unit number of the serial port you wish to use.

The next most desirable method involves the use of our own logical device designations `GVPPar0:` and `GVPSer0:`. These are managed by a "handler" resource in the system `L:` directory. Some programs—print spoolers, for instance—allow you to specify such a logical designator as the output device.

Finally, for software that cannot be reassigned in any other way, GVP provides a means of intercepting, on a system level, all calls to the Amiga's own parallel or serial devices and redirecting them to the corresponding GVP ports. *Chapter 3 - Software Reference* will describe the utility programs we provide to make this possible.

## CHAPTER 2.

# GETTING STARTED

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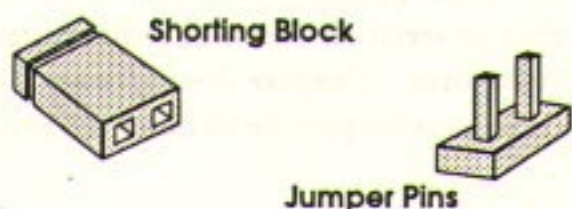
### Configuration

The IOExtender board has several physical settings that allow you to configure certain hardware options. All other control can be accomplished through software. You will likely only change one of these settings, although all of them are detailed below for reference purposes. Inspect your board to ensure that these settings are as described in Table 2.1, below.

**CAUTION:** IOExtender boards are extremely sensitive to static discharge or physical shock. Always be sure to ground yourself by touching a metal surface prior to handling the board or its components. Do not drop or physically jar the board or its components. Failure to observe these precautions may result in irreparable damage to the IOExtender board.

### Jumpers

The IOExtender board is configured through the use of *jumper pins* and *shorting blocks*. At various points on the board are a number of upright metal pins. These are connection points for various open circuits. Installing a shorting block onto a pair of pins completes the circuit.



*Figure 2.1 – Jumper block and pins.*

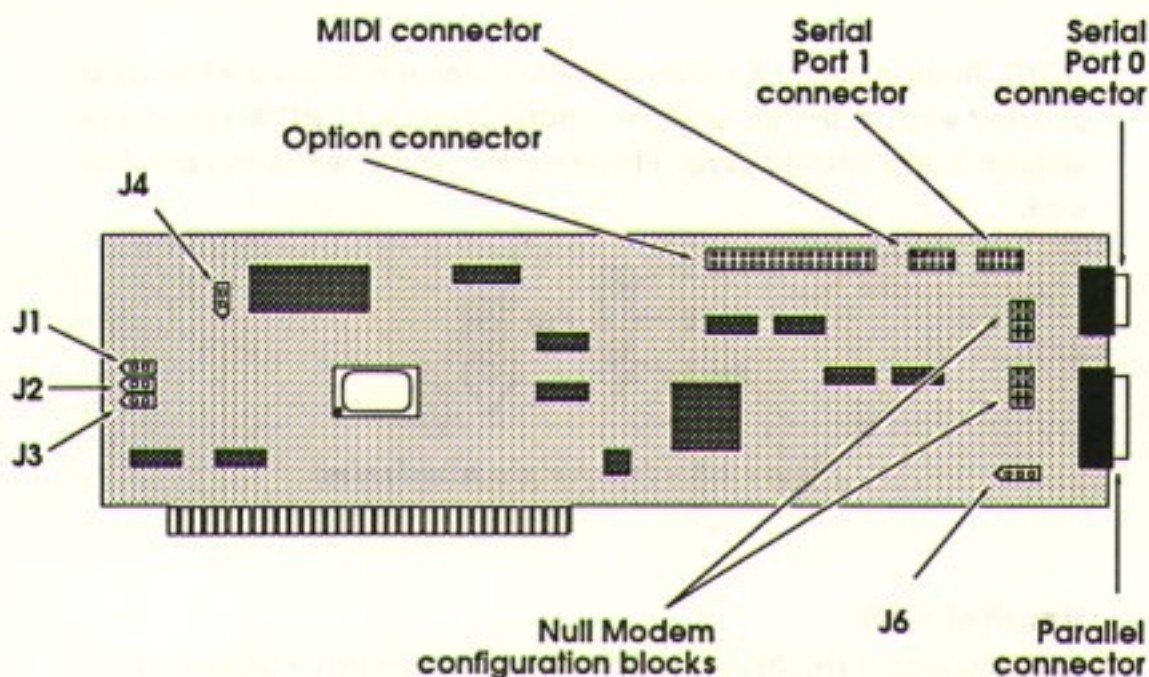


Figure 2.2 – IOExtender board jumper locations.

**Table 2.1**  
**JUMPER DEFAULT SETTINGS**

<b>Jumper</b>	<b>Open</b>	<b>Closed</b>	<b>Default</b>
J1	RESERVED	RESERVED	Open
J2	RESERVED	RESERVED	Open
J3	RESERVED	RESERVED	Open
J4	RESERVED	RESERVED	Open
<b>Jumper</b>	<b>Pins 1 &amp; 2</b>	<b>Pins 2 &amp; 3</b>	<b>Default</b>
J6	Amiga Parallel	PC compatible Parallel	Pins 1 & 2

NOTE: The IOExtender board does not contain a jumper labeled J5.

NOTE: Three-pin jumpers have polarity which is indicated either by a pointed end on the jumper pin mount, itself, or in white ink on the surface of the circuit board. Pin one is the pin closest to the pointed end.

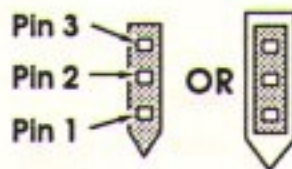


Figure 2.3 - Jumper pin numbering.

### Parallel Port

Amiga standard parallel ports differ slightly from those on most PCs. This can lead to problems when cabling various types of printers. The Amiga port supplies voltage on one of its pins (*allowing such devices as sound samplers and video digitizers to derive their power from the Amiga's supply*). If you mistakenly connect the wrong type of printer cable, this voltage can damage printers or other parallel devices that do not expect to find voltage on this pin.

The IOExtender board's parallel port can be set to behave as either an Amiga parallel port (*with 5 volts supplied on pin 14*), or as an IBM standard parallel port (*with no power supplied*). Selection is accomplished by setting jumper J6 as shown:

**WARNING:** When configured as an Amiga standard parallel port, pin 14 on the DB-25 connector will carry 5 volts. Be sure to use proper cabling in order to avoid damaging your parallel peripherals.

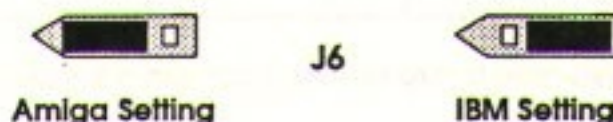
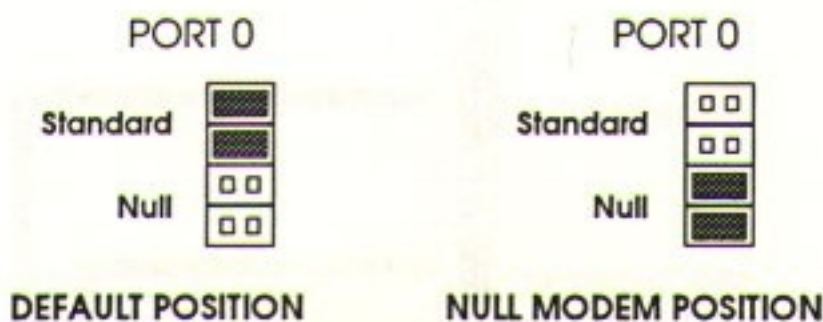


Figure 2.4 - Jumper setting for IOExtender parallel port.

### Null Modem Option

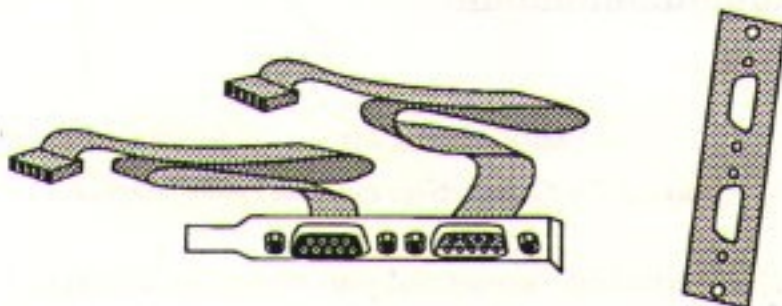
While most users will operate the IOExtender's serial ports as standard RS-232 devices, we provide the means to change one or both ports to a Null Modem configuration. This setting simply switches the Transmit Data (TXD) and Receive Data (RXD) lines. It does not alter the hardware handshaking lines. If you wish to make this change, move the pair of jumper blocks from one position to the other as shown in Figure 2.5. This information is also indicated directly on the IOExtender circuit board.



*Figure 2.5 – Null Modem configuration option.*

### Connecting External Port Bracket

Now you must decide which rear panel expansion slot you wish to use for the IOExtender's external port connector bracket. Normally, you will use one of the unoccupied Zorro or PC expansion slots, but you may also elect to use one of the CPU slot locations. Once you have made this choice, locate the appropriate replacement cover plate among the items included in your IOExtender kit.



*Figure 2.6 – Ribbon cable and bracket assembly (with alternate slot cover plate).*



To change the slot cover used, remove the existing cover plate from the external connectors. Use a small wrench or nut driver to unthread the nuts holding the plate to the DB-9 connectors. Then, insert each DB-9 connector into the alternate cover plate and replace the nuts.

With the proper slot cover plate attached, locate the two 10-pin headers at the top edge of the IOExtender board (see Figure 2.7) and attach the ribbon cables as illustrated. Both ribbon cable connectors are *keyed* and can only be attached one way.

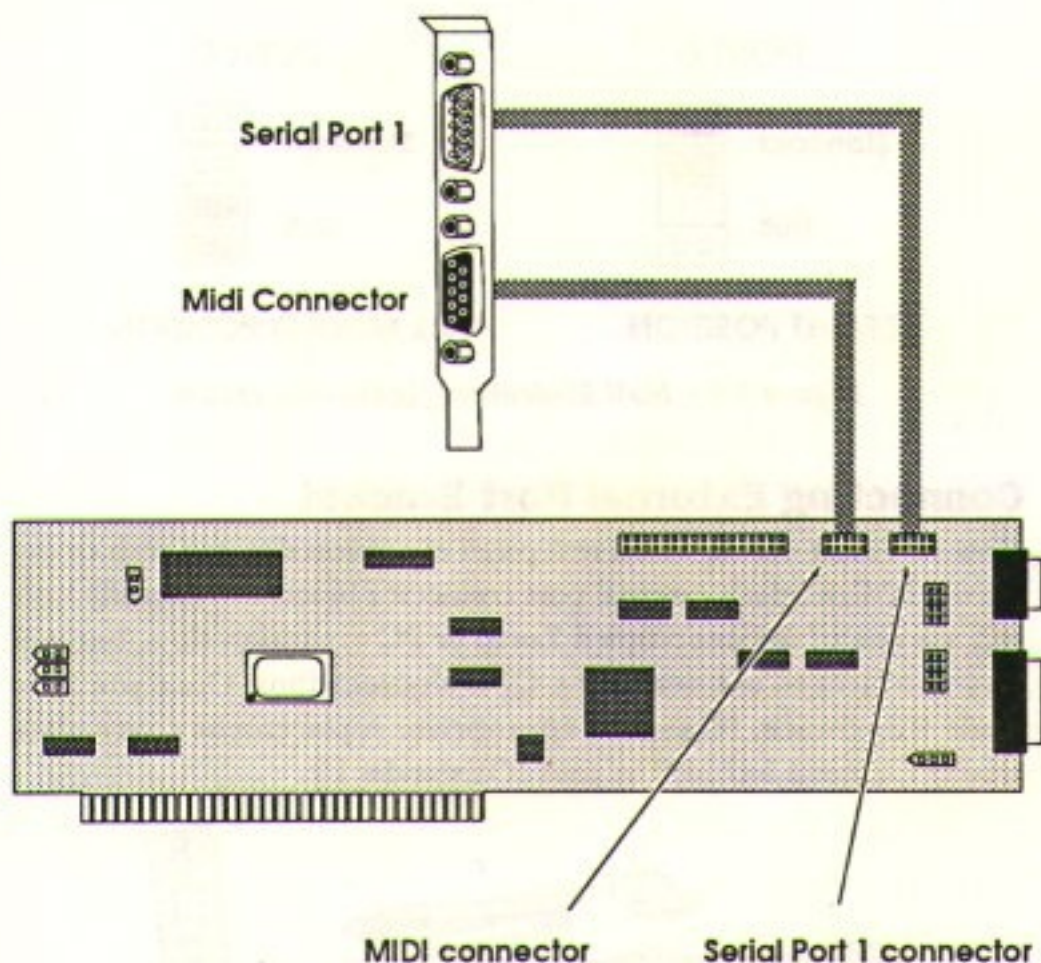


Figure 2.7 - Connecting external port bracket.

Once you have attached the external port connector bracket, correctly set jumper J6 and determined that all others are properly configured, you may proceed to install the board into your Amiga.

## Hardware Installation

### “What you need”



You will need a medium sized cross-point screwdriver to install the IOExtender board.

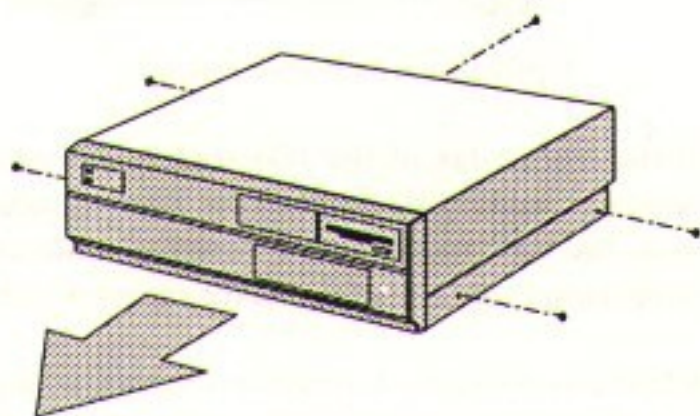
### Installation Procedure

Described below are installation procedures for both Amiga A2000 and A3000 computers. Follow all indicated steps of the procedure for your class of machine. Skip those steps that do not apply.

### Cover Removal

Both Amiga A2000 and A3000 case covers are secured by 5 cross-point screws. The procedure for removing the cover is the same for each machine.

- 1) Remove the screws from the computer's cover. There are 5; one at the top center on the rear panel, and two along the bottom edge of each side.



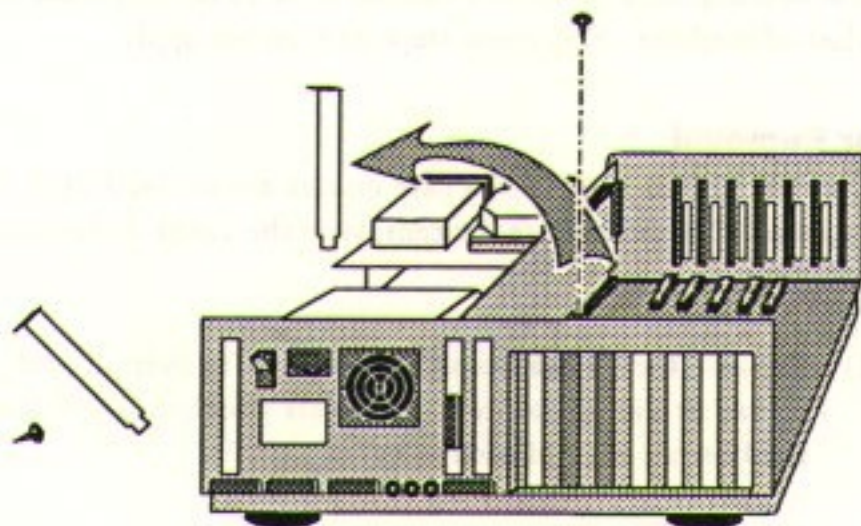
*Figure 2.8 – Cover removal showing screw locations.*

- 2) Remove the cover by pulling forward and away. A3000 owners should now skip to step 8.

### A2000 Procedure

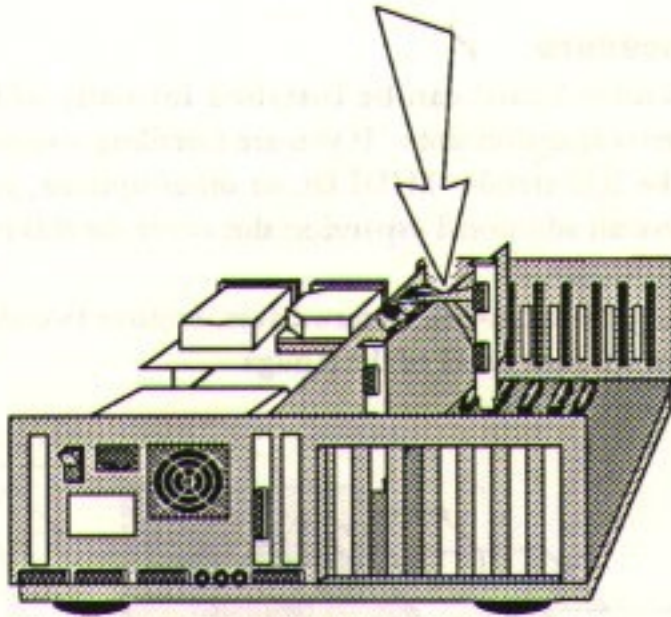
The IOExtender board can be installed into any of the Amiga A2000's Zorro expansion slots. If you are installing a second external serial port, the IOExtender MIDI kit, or other options, you will also need to reserve an additional expansion slot cover for this purpose.

- 3) Using the cross-point screwdriver, remove two slot covers from the rear panel of the Amiga.



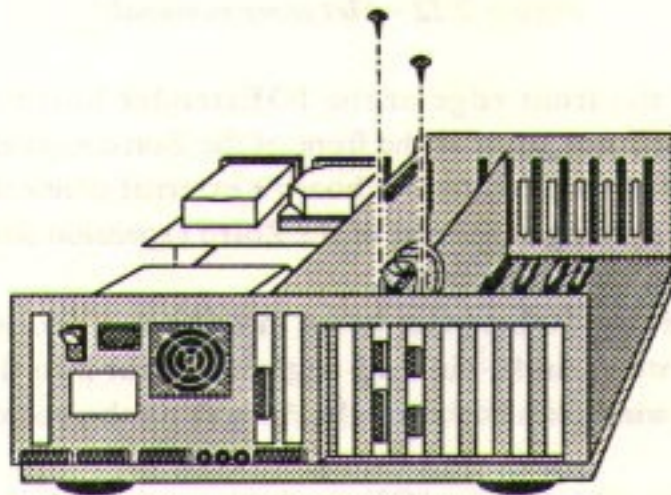
*Figure 2.9 – Slot cover removal.*

- 4) Fit the front edge of the IOExtender board into the plastic slot guide at the front of the Zorro expansion slot. Guide the IOExtender board's external connectors into the opening at the rear of the Zorro expansion slot.
- 5) Slide the IOExtender board into the slot, taking care to locate its multi-pin card-edge connector into the Zorro expansion slot socket on the Amiga's motherboard.
- 6) Take care that the IOExtender board's edge connector and the Zorro slot are properly aligned. Press the IOExtender board firmly into the Zorro slot socket. Do not overstress the motherboard.



*Figure 2.10 – Board insertion.*

- 7) Insert the external port connector bracket into the second vacant expansion slot cover position. Secure it and the IOExtender board using the screws you removed earlier.



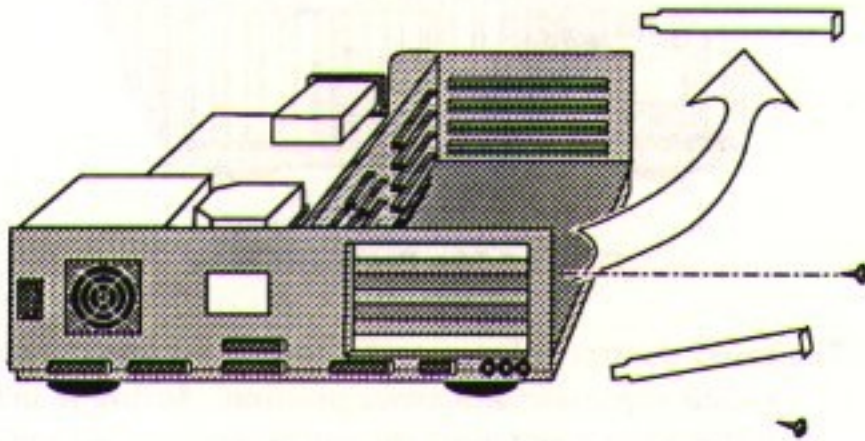
*Figure 2.11 – Securing the IOExtender board.*

- Now skip to Final Assembly, step 13.

### A3000 Procedure

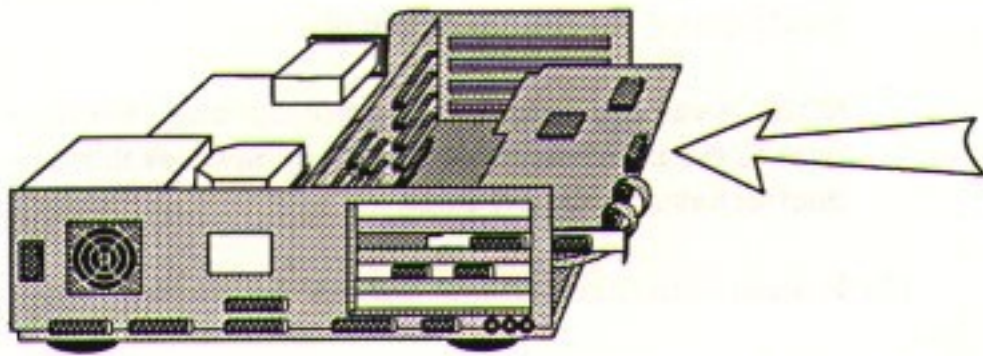
The IOExtender board can be installed into any of the Amiga A3000's Zorro expansion slots. If you are installing a second external serial port, the IOExtender MIDI kit, or other options, you will also need to reserve an additional expansion slot cover for this purpose.

- 8) Using the cross-point screwdriver, remove two slot covers from the rear panel of the Amiga.



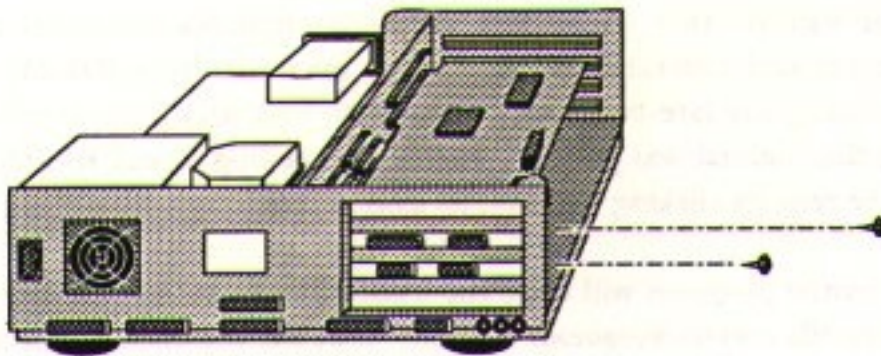
*Figure 2.12 – Slot cover removal.*

- 9) Fit the front edge of the IOExtender board into the plastic slot guide at the front of the Zorro expansion slot. Guide the IOExtender board's external connectors into the opening at the rear of the Zorro expansion slot.
- 10) Slide the IOExtender board into the slot, taking care to locate its multi-pin card-edge connector into the Zorro expansion slot socket on the Amiga's motherboard.
- 11) Take care that the IOExtender board's edge connector and the Zorro slot are properly aligned. Press the IOExtender board firmly into the Zorro slot socket. Do not overstress the motherboard.



*Figure 2.13 – Board insertion.*

- 12) Insert the external port connector bracket into the second vacant expansion slot cover position. Secure it and the IOExtender board using the screws you removed from the slot cover.



*Figure 2.14 – Securing the IOExtender board.*

## **Final Assembly**

- 13) Inspect your work to determine that the IOExtender board is correctly seated, the ribbon cables are dressed neatly away and any other components, boards or cables you may have removed are replaced.



- 14) Replace the Amiga's cover using the reverse of the described procedure and then attach whatever serial or parallel peripheral equipment you plan to use.

**NOTE:** If you are installing the MIDI Option at this time, refer to the documentation that accompanies that product for further assembly steps.

- 15) Proceed to the next section: *Software Installation*.

## Software Installation

Each IOExtender board is shipped with a 3.5" floppy disk containing an installation program and a number of important utilities for use with the IOExtender system. Boot your Amiga from your normal system disk (*most likely a hard drive*), and then insert the floppy disk. When it appears on the Workbench, double-click the icon representing the IOExtender distribution disk.

In the window that opens, you will see an icon for the installation program and several drawers. There may also be a *ReadMe* file containing any late-breaking information that may have developed since this manual was printed. Before proceeding, check this file. It may be read by clicking twice on its icon.

The Install program will copy the utility files to your hard disk and edit the file *s:startup-sequence* for you. Start the automated procedure by double-clicking the Install icon. Respond to the prompts as they are displayed. Note that you may choose the level of control required: Novice, Intermediate or Expert. If, at any time, you don't know how to proceed, click the help button and an appropriate explanation will be displayed.

All included software is fully documented in *Chapter 3 – Software Reference*. Proceed to that chapter to learn how to control the IOExtender's features.



## CHAPTER 3.

# **SOFTWARE REFERENCE**

---

By the time you have reached this chapter, you should already have the IOExtender board installed in your Amiga. If you haven't, be sure to read *Chapter 2 - Getting Started* thoroughly before proceeding.

**NOTE:** If you did not use the GVP supplied Installation program, make sure that the file `SetDevice` is copied into your current command path and that it is run before proceeding. Install will ordinarily add the line:

```
Run >NIL: SetDevice
```

to your startup sequence to ensure that it is active when `GVPIOControl` tries to use it.

We provide three different ways for your software to make use of the IOExtender board's ports. The most flexible way requires that your software—a telecommunications program, for instance—be individually configured to address the GVP port directly. In the popular shareware terminal program, *JRComm*, for instance, you can specify the name of the serial port you wish to use. In this case, you would type `gvpser.device` in place of the default `serial.device`.

The next method involves the use of logical device designations `GVPPar0:` and `GVPSer0:`. These are managed by a "handler" resource in the system `L:` directory. Some programs allow you to specify such a logical designator as the output device. AREXX programmers will find this the preferred method for customized multimedia systems.

Finally, for software that cannot be reassigned in any other way, we provide a means of intercepting, on a system level, all calls to the Amiga's parallel or serial devices and redirecting them to the corresponding GVP ports. The tool for achieving this is called *GVPIOControl*.





## GVPIOControl

Unless specifically written for an expandable system, not all software will be able to access the IOExtender board's ports. GVPIOControl allows you to intercept ordinary system calls to the Amiga's serial or parallel ports and have them redirected to the ports on the IOExtender. In this way, you can make these ports the defaults for most current software.



GVPIOControl sets default conditions for another program: *SetDevice*, which has been copied to your system disk by the installation program. *SetDevice* will be run each time you boot your system and will immediately begin monitoring the serial and parallel ports for activity. If GVPIOControl tells it to, it will divert data to the IOExtender ports instead of the Amiga's ports.

Click twice to open the Prefs drawer and click twice on the *GVPIOControl* icon to launch this program.

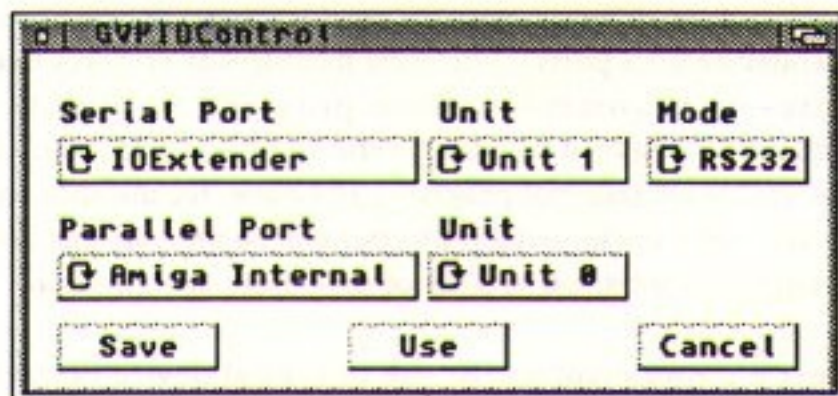


Figure 3.1 – GVPIOControl window.

### Default Serial Port

Clicking on the Serial Device button will toggle between Amiga and IOExtender settings. When you select Amiga as the default, the system will operate normally, sending all system calls to the Amiga's built-in serial port connector.



### Default Serial Port

IOExtender     Unit 0     RS232

When you select **IOExtender**, all system calls to the Amiga's serial port will be intercepted by **SetDevice** and rerouted to the designated serial port on the **IOExtender** board. This setting requires that you make two additional selections: **Unit Number** and **Port Connector (RS232/MIDI/AUX)**.

### Unit Number Selection

Clicking on the **Unit Number** button will cycle upward through all available **Unit** numbers. Holding down the **Shift** key while clicking will cycle backward through the available **Unit** numbers. Normally, the **Unit Number** selector will default to 0. If you choose to make the **IOExtender's** second port (*port number 1*) the default, advance the **Unit Number** selector to 1.

If your system includes a **GVP A2000 G-Force '040** accelerator, its serial port will always be assigned as **Unit 0**. **Unit 1** is not used, since the **G-Force** board has only one serial port. In this case, the first port on your **IOExtender** board will become **Unit 2** and its second port will be **Unit 3**. If there are other **IOExtender** boards present, you can select any serial port from any one of these boards, simply by cycling through the **Unit ID** numbers. Refer to the discussion in **Chapter 1** for port numbering order.

### Serial Port Connector

The third button, **Serial Port Connector**, tells the **IOExtender** software which physical port connector to send data through. You will recall from the **Configuration** section of **Chapter 2** that there are three multi-pin connectors along the top edge of the **IOExtender** board. If you installed the external port bracket, you connected ribbon cables to the **Serial 1** and **MIDI** connector. The 34-pin **Option** or **Auxiliary** connector is currently reserved for future use.

When set to **RS-232**, The **IOExtender** software will address the currently selected port through the 9-pin male **DB-style** connector



mounted at the back of the IOExtender board or to the 9-pin male DB connector on the external bracket (*depending which port is selected*). When set to MIDI, it will send serial communications for the selected port through the 9-pin female DB connector to the patch box included in the MIDI Extender option kit. When AUX is selected, the signals will be sent to the 34-pin Option header. At this time, the AUX setting should not be used.

## Default Parallel Port

### Default Parallel Port

IOExtender     Unit 0

Clicking on the Parallel Device button will toggle between Amiga and IOExtender settings. When you select Amiga as the default, the system will operate normally, sending all system calls to the Amiga's built-in parallel port connector.

When you select IOExtender, all system calls to the Amiga's parallel port will be intercepted by SetDevice and rerouted to the parallel port on the indicated IOExtender board. This setting requires that you make one additional selection: Unit Number.

## Unit Number Selection

Clicking on the Unit Number button will cycle upward through all available Unit numbers. Holding down the Shift key while clicking will cycle backward through the available Unit numbers. Each IOExtender board has only one parallel port, so the Unit Number selector will default to 0.

If your system includes a GVP A2000 G-Force '040 accelerator, its parallel port will always be assigned as Unit 0. In this case, the parallel port on your IOExtender board will become Unit 1. Unit 2 would address the parallel port on the next IOExtender board, and any other parallel ports on additional boards are referenced in sequence as Unit 3, Unit 4, etc. Refer to the discussion in Chapter 1 for port numbering order.



## Exiting GVPIOControl

When you have set the GVPIOControl parameters to your liking, you can click the **Save** button to record them as the default system configuration. These settings will then become operative each time you reboot your system. If you do not want the settings to be permanently recorded, click the **Use** button. The configuration will remain operative only until your next system reboot. If you decide to exit the program without making any changes, click the **Cancel** button and any parameters that were altered will be restored to their original condition.

## Effective Use

As mentioned, GVPIOControl is the least flexible method for using the ports on your IOExtender board. Since it wedges itself into the Amiga's operating system and intercepts all calls on a system level, it effectively substitutes the GVP ports for your Amiga's ports. It does not necessarily permit one program to use the GVP ports while other programs are free to use other ports.

The only way to actually use multiple serial and multiple parallel ports simultaneously is through individual applications programs that permit their input and output ports to be specified either as logical devices (GVPPar0:, GVPSER1:, etc.) or as physical devices (gvp-par.device, gvpser.device, etc.).

## GVPSerial Preferences

The serial ports on the IOExtender board (*and any other serial ports on a A2000 G-Force '040 accelerator or additional GVP IOExtender expansion boards*) can

be controlled through a preferences utility that functions much the same as the standard Workbench preferences utilities. This program is automatically installed in your Prefs drawer by the Install040 program.



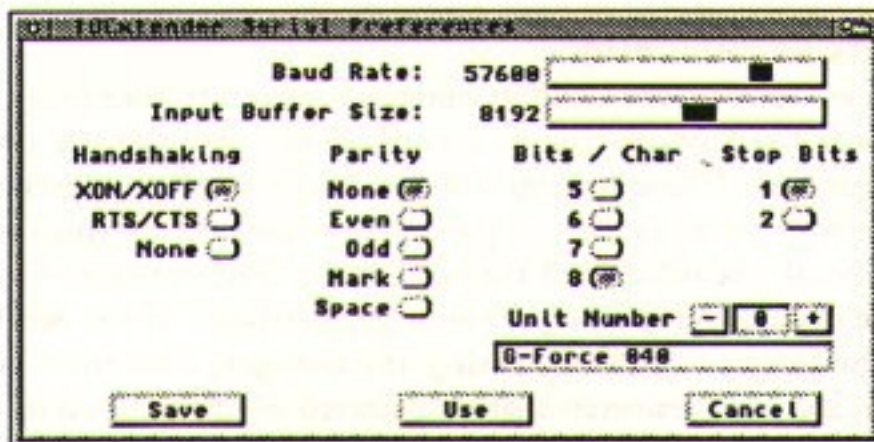


Figure 3.2 – GVPSerial preferences panel.

### Baud Rate

Baud Rate: 57600


The serial port on the IOExtender board is capable of a much wider range of transmission speeds than the standard Amiga serial port. Drag the slider to set the serial port's transfer rate. As you do so, the numbers displayed to the left will increment (*or decrement*), to show the value obtained.

All transfer rate settings are expressed in terms of bits per second (*bps*) except MIDI, CUSTOM and MAXIMUM. The MIDI setting is typically 31,250 bps. The MAXIMUM setting will simply drive the serial port as fast as it can. In order to set your own custom transmission rate, adjust the Baud Rate slider until CUSTOM is displayed. Then, locate the Miscellaneous Menu (*by holding down the Right Mouse Button and moving the mouse pointer up to the top of the screen*).

When you select the Set Custom Baud Rate menu item, a requester window will open. This requester contains a text-entry field into which you can type any baud rate desired. Note that you may specify only transfer rates of which the IOExtender is capable. If the GVPSerial utility is unable to deliver exactly the rate requested, it will report the actual rate achieved and the percent of variance from the specified value.



## Input Buffer Size

Input Buffer Size: 8192 

Unlike the Amiga's standard serial port, the IOExtender's serial ports have hardware buffers of 16 bytes each for receiving and transmitting. Each port also has a variable-size software buffer where incoming data can be cached while your application is busy doing other things.

You can set the Input Buffer Size by adjusting the slider until the desired value is displayed. Acceptable values range from 512 to 65,536 bytes. A 2 Megabyte Amiga system can easily support a 16k serial buffer.

## Handshaking

Although serial devices are two-way communicators, information can only be passed through sequential exchanges. One device *talks* while the other one *listens* and vice versa. Handshaking protocols are the means by which two serial devices determine which talks when.

### Handshaking

XON/XOFF

RTS/CTS

None

- XON/XOFF is a software-based protocol. When a XON character is received, the sending unit knows to begin transmitting. When a XOFF character is received, the sender stops transmitting and waits for the next XON signal.
- RTS/CTS is a hardware-level protocol. When compatible devices are connected with the proper cables, transfers will be managed entirely through the circuitry built into the equipment. The sending device transmits a *Request To Send (RTS)* signal and waits for a *Clear To Send (CTS)* reply.
- Some unusual equipment may not require handshaking protocols at all. When None is selected, data will be sent



as quickly as the hardware permits. If something on the other end interferes with the orderly processing of data as it is received, some information will be lost.

### Parity

Parity is a method of checking for errors while data is being transmitted. A Parity bit is used to adjust each transmitted character to meet these criteria:

**Parity**  
None   
Even   
Odd   
Mark   
Space

- NONE means that no parity bit is used.
- EVEN means that the total number of 1 bits in each transmitted character is even. If the source data contains an odd number of 1 bits, then the Parity bit will be set to 1. If the source data has an even number of 1 bits, the Parity bit will be 0.
- ODD means that the total number of 1 bits in each transmitted character is odd. If the source data contains an even number of 1 bits, then the Parity bit will be set to 1. If the source data has an odd number of 1 bits, the Parity bit will be 0.
- MARK means that the parity bit will always be set to 1.
- SPACE means that the parity bit will always be set to 0.

### Bits/Character

Bits/Char (*Bits per Character*) tells your device how many data bits each character contains. The most common number of bits/character is 8. Many devices still use 7, and your IOExtender will even support older hardware that relies on 5 or 6 bits/character.

**Bits / Char**  
5   
6   
7   
8



## Stop Bits

Stop Bits are used to tell a device to stop sending information down the data path. Some devices require 1 Stop Bit; others expect 2.

## Stop Bits

1   
2

**NOTE:** If you configure your serial device to send 5 data bits per character, the Stop Bit choices automatically change from 1 or 2 to 1 or 1.5.

## Unit Number

The IOExtender has two serial ports, normally numbered Unit 0 and Unit 1.

Unit Number

G-Force 040

If you have a A2000 G-Force '040 accelerator, then its serial port becomes Unit 0 and there will be no Unit 1. The IOExtender's serial ports become Units 2 and 3 and, on any additional IOExtender boards installed in your system, each serial port will be assigned an incrementally higher Unit number. The Unit Number selector in the GVPSerial utility provides a method for making a unique setup configuration for each separate serial port.

As you cycle through the possible Unit Numbers, the status line beneath the selector will display the identity and location of the selected port.

## GVPSerial Menus

The GVPSerial preferences utility has three menus, in addition to its onscreen buttons and selectors. These menus make it possible to create and save many different configuration presets that can be loaded and used as needed. The complete menus are detailed below:





## Project Menu

- **Open** loads a predefined settings file and configures the selected serial port accordingly.
- **Save As...** When you click the **Save** button in the GVPSerial preferences utility, the settings become a part of the utility's default configuration. The **Save As...** menu item allows these settings to be saved as a non-default file. This can be reloaded at any time using the **Open** menu.
- **Quit** provides a menu-based method for exiting the GVPSerial preferences utility.



## Edit

Each GVPSerial preferences project icon contains two sets of configuration data in the form of Tooltypes: A set of factory defaults and the last saved User Settings. At any time during a GVPSerial preferences configuration session, you can restore either the factory defaults or the last saved settings.

- **Reset to defaults** examines the GVPSerial preferences icon and restores the factory default settings encoded there.
- **Last Saved** examines the GVPSerial preferences icon and restores the User Settings encoded there.
- **Restore** resets the currently selected Unit to the settings in effect prior to the most recent changes.



## Miscellaneous

- **Set Custom Baud Rate.** When you set the Baud Rate slider to its CUSTOM setting, you must select this menu item and type your custom transfer rate value into the text-entry field provided.





### **Exiting GVPSerial Preferences**

When you have set the GVPSerial preferences parameters to your liking, you can click the **Save** button to record them into the Tooltypes for the GVPSerial preferences utility icon. These settings will then become operative each time you reboot your system. If you do not want the settings to be permanently recorded, click the **Use** button. The configuration will remain operative only until your next system reboot. If you decide to exit the program without making any changes, click the **Cancel** button and any parameters that were altered will be restored to their original condition.



## CHAPTER 4.

# **APPLICATION EXAMPLES**

The next few sections will present some likely examples of how to connect and use various peripherals and applications software. It is important to remember that there may be many different ways of configuring your own system to your liking. We do not suggest that our methods are any more correct than yours.

### **Modem and Serial Printer**

Our first example involves connecting both a modem and a serial printer—such as the Apple ImageWriter II—to the IOExtender equipped Amiga. This is a simple arrangement if your telecommunications software allows for user-specified I/O ports. In this case, we will use the first IOExtender serial port for the modem and the second one for the serial printer.

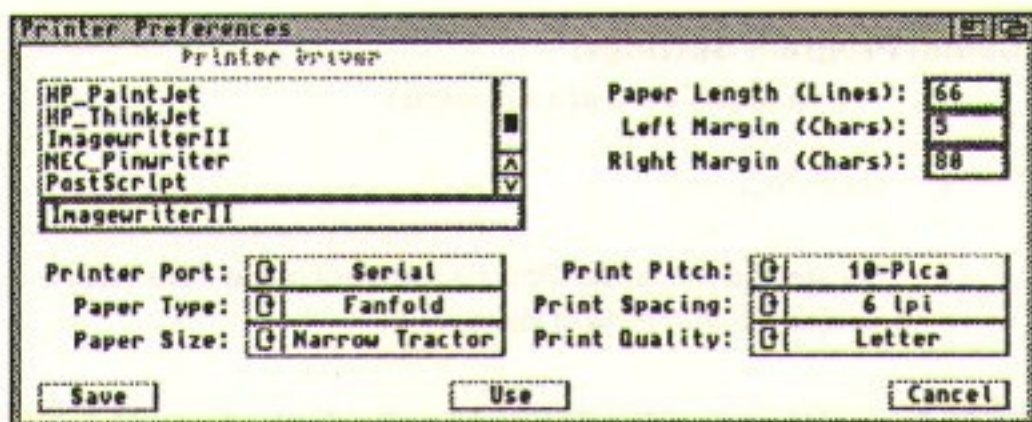
#### **Connections:**

- Connect your modem to the first (*onboard*) IOExtender serial port.
- Connect the serial printer to the second IOExtender serial port.

Since most common productivity applications and print utilities do not permit retargeting of the printer port, we will use the GVPIOControl program to accomplish this.

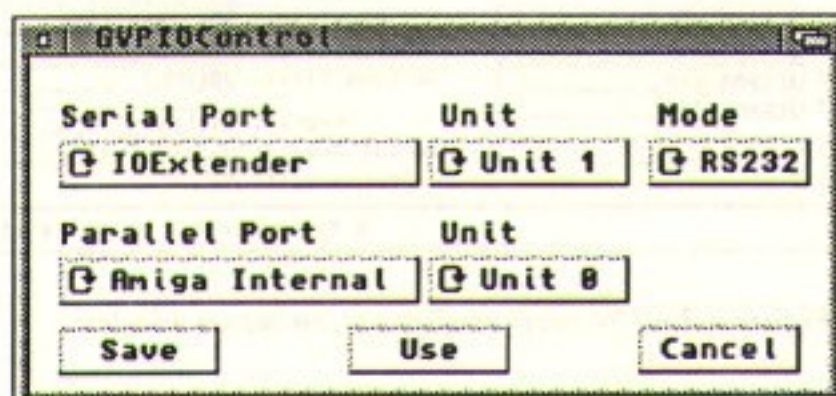
#### **Preferences Settings:**

- Select the Printer Preferences utility and set it to address the printer from the serial port.



*Figure 4.1 – Printer preferences settings for ImageWriter II.*

- Open the GVPIOControl preferences utility and set it as follows:



*Figure 4.2 – Configuring GVPIOControl to intercept serial.device calls..*

- Set the Serial Port button to IOExtender.
- Set the Unit button to Unit 1.
- Make sure the Mode button is set to RS-232.

When you Save or Use these settings, your serial printer will be available to all Amiga programs that output to the printer.device.

## Comm Program Settings:

(using JRComm as an example)

- Start JRComm.
- Locate and select the Options/General menu item (*Right Amiga 8 is the keyboard shortcut*).

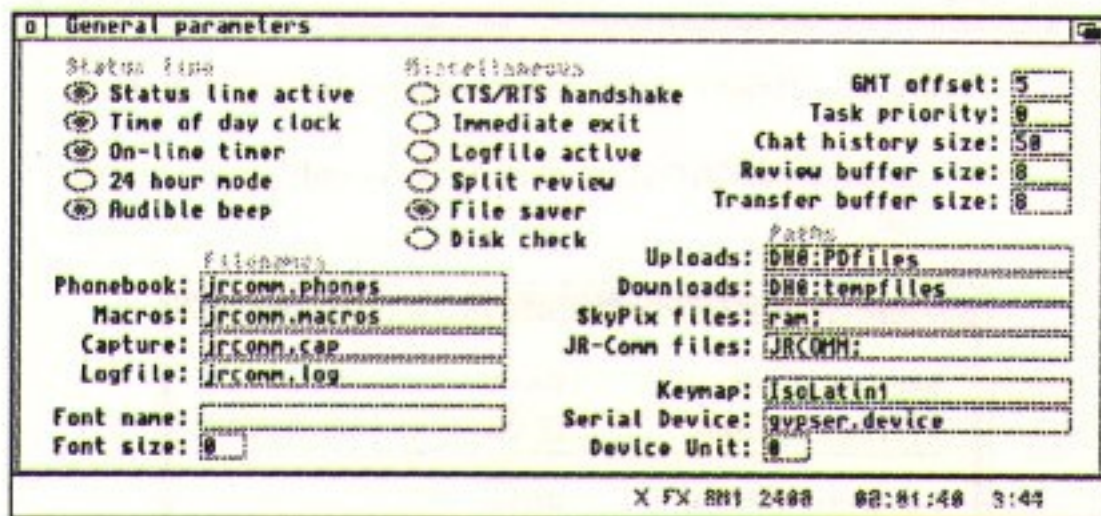


Figure 4.3 – JRComm configuration menu window.

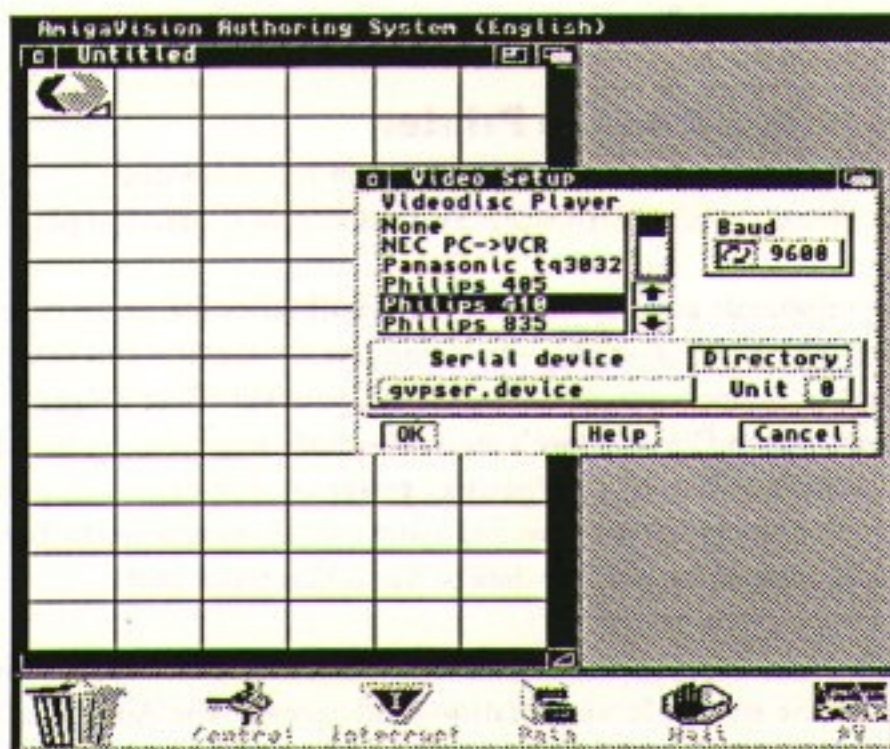
- Make the following settings:
  - Enter `gvpser.device` into the text entry field labeled Serial Device.
  - Enter `0` in the Device Unit text entry field.
- Save these settings as the JRComm default configuration. When you use JRComm, it will address IOExtender Serial port Unit 1. If you try to print files from within JRComm or from another program running simultaneously, all calls to the Amiga's printer.device will be rerouted to the second IOExtender port by GVPIOControl and SetDevice.

## Multimedia Presentation System

IOExtenders can also simplify the construction of interactive multimedia systems. Presentation tools, such as Commodore's AmigaVision authoring system, provide a means of addressing laserdisc players through the IOExtender's serial ports. In addition, those with some degree of programming experience in high-level languages, such as C and Pascal, can construct even more elaborate control systems.

### Configuring AmigaVision:

- Run AmigaVision.
- Select the Configuration/Video Setup menu item. A small requester will open, displaying a list of supported video equipment.



*Figure 4.4 – Configuring AmigaVision to use an IOExtender serial port.*



- At the bottom of this requester are text entry fields for specifying the name and unit number of a serial device through which AmigaVision will control the selected video player.
- Type `gvpser.device` into the provided text entry field and select the appropriate Unit number.
- Save these settings. When the program is run, all control sequences sent to the laserdisc or other device will be directed through the specified IOExtender serial port.

### **Multi-line Bulletin Board System**

A multiple-line Bulletin Board System can be constructed in much the same way as a single-line modem connection. In this case, however, each phone line will be handled by a modem connected to a separate IOExtender serial port. In this way, you can have up to ten lines all serving the same BBS program.

### **DSS with a Parallel Printer**

Many digitizers access Amiga parallel port hardware directly. These are unaffected by the `SetDevice/GVPIOControl` redirection program.

Such peripherals actually increase the possibilities for using multiple parallel ports. Ordinarily, when you use `SetDevice` and `GVPIOControl` to redirect `parallel.device` calls, you will affect *all* programs that conform to Commodore's recommended programming practices. Any printing utility or productivity program that expects a parallel printer and any preferences setting tying `printer.device` to the parallel port will, instead, be sending data to the IOExtender port.

Since a digitizing program, such as our own Digital Sound Studio, bypasses the system-level operations and accesses the Amiga parallel port circuitry directly, it will be unaffected by `GVPIOControl`. If you connect the DSS digitizer to the Amiga's built-in parallel port, it will function normally.



## CHAPTER 5.

# **TROUBLESHOOTING**

---

**NOTE:** Before calling GVP for technical support help, please complete the following troubleshooting steps yourself:

- 1) Check all cable connections.
- 2) Verify that the external device (*printer, modem, etc.*) you're connecting to the IOExtender works properly when it's connected to the Amiga's built-in I/O port.
- 3) Re-install the IOExtender software.
- 4) Reboot the Amiga and try using the IOExtender software again.

Listed below are some additional solutions to typical interface problems:

### **PROBLEM**

---

- Amiga does not boot.

### **SOLUTION**

---

- After installing the IOExtender, check all cables—including power and video—to make sure they are attached.

### **PROBLEM**

---

- Serial printer does not work.

### **SOLUTION**

---

- Make sure the cables are properly connected.
- Make sure the baud rate, parity, and stop bit settings are the same for both the IOExtender and the printer.
- Make sure the printer is powered ON.
- Make sure the printer is ON-LINE.





### **PROBLEM**

---

- “Garbage” occurs during communications transmission or reception.

### **SOLUTION**

---

- Make sure the baud rate, parity and stop bit settings are the same for both the IOExtender and the modem and/or the other computer.

### **PROBLEM**

---

- Serial port opens, but no data is transferred.

### **SOLUTION**

---

- Check user documentation, if possible, to see if the use of a “null-modem” serial cable may be required. Instead of using a null modem cable, you may elect to change the serial port Null Modem configuration jumpers (*See Chapter 2 for details*).
- Try disabling the CTS/RTS flow control option.

### **PROBLEM**

---

- Parallel port does not open.

### **SOLUTION**

---

- Make sure the file *GVPIO* is in the Expansion drawer.
- Make sure the “binddrivers” command has been executed (*usually done during startup*).



### **PROBLEM**

---

- Serial port does not open.

### **SOLUTION**

---

- Make sure the file *GVPIO* is in the Expansion drawer.
- Make sure the “binddrivers” command has been executed (*usually done during startup*).

### **PROBLEM**

---

- GVPPar0: does not work.

### **SOLUTION**

---

- Make sure the port handlers—located in the file “gvp-porthandler”—have been placed in the *L:* directory.

### **PROBLEM**

---

- GVPSer0: does not work.

### **SOLUTION**

---

- Make sure the port handlers—located in the file “gvp-porthandler”—have been placed in the *L:* directory.

### **PROBLEM**

---

- Printouts go to the wrong port.

### **SOLUTION**

---

- Make sure that SetDevice has been run.
- Check all the settings in the GVPIOControl program.



## APPENDIX A.

# **CUSTOMER SERVICE**

GVP provides customer support for its hardware and software products through its network of authorized dealers. In most cases, your dealer may offer the fastest and most convenient solution when repair or replacement of equipment is necessary.

GVP also maintains a telephone Technical Support line, Monday, Wednesday, Thursday, and Friday, from 9:15 a.m. to 6:00 p.m. Eastern Time in the United States at (215) 354-9495. On Tuesdays, the Tech Support line opens at 10:30 a.m. Wherever possible, callers should determine that the problem they are reporting is repeatable (*i.e.: it happens more than once*), and be able to describe in detail the particular symptoms and system configuration in use.

GVP can also be reached via FAX, at (215) 337-9922 or by post at our U.S. mailing address:

Great Valley Products, Inc.  
600 Clark Ave.  
King of Prussia, PA 19406

Customer Number: \_\_\_\_\_



APPENDIX B.

**PROBLEM REPORTING FORM**

When calling GVP Technical Support, please take the time to complete this form. Telephone support personnel will be better able to assist you if you can provide this detailed information. Users may, alternately, FAX a copy of this form to GVP at (215) 337-9922.

Name: \_\_\_\_\_

Date: \_\_\_\_\_ Customer Number: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_

Country: \_\_\_\_\_ Postal Code: \_\_\_\_\_

Telephone Number: \_\_\_\_\_

Product: \_\_\_\_\_

Serial Number: \_\_\_\_\_

Revision: \_\_\_\_\_

Describe the problem in terms of symptoms and the conditions under which it occurs: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



## Machine Configuration

Amiga Model: \_\_\_\_\_

Motherboard Revision: \_\_\_\_\_

Kickstart (ROM) Version: \_\_\_\_\_

Workbench Version: \_\_\_\_\_

Chip Set Version: \_\_\_\_\_

Amiga CPU Installed: \_\_\_\_\_

Amiga clock speed: \_\_\_\_\_

Note any and all expansion products installed (*including competitors' products*):

CPU Slot: \_\_\_\_\_

Expansion Slot #1: \_\_\_\_\_

Expansion Slot #2: \_\_\_\_\_

Expansion Slot #3: \_\_\_\_\_

Expansion Slot #4: \_\_\_\_\_

Expansion Slot #5: \_\_\_\_\_

Video Slot: \_\_\_\_\_

PC Slot #1: \_\_\_\_\_

PC Slot #2: \_\_\_\_\_

PC Slot #3: \_\_\_\_\_

PC Slot #4: \_\_\_\_\_



**Hard Drives Attached:**

List the Unit ID numbers, manufacturers and capacities of all hard drives attached to your system; also any floppy, tape or other devices:

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