1 PRODUCT OVERVIEW

1.1 INTRODUCTION

This manual describes both the PortShare/PrintShare A2000 and A2100. These devices are identical in operation and differ only in their combination of serial and parallel ports. For this reason, both units will be referred to in this manual as the 'A2x00'. Where an operation is appropriate to only that device it will be referred to as either the A2000 or A2100.

The PortShare/PrintShare A2x00 is a multi-port, intelligent Peripheral Sharing Devices (PSD). Eight ports are available to create a variety shared working environments. Combining six PCs to share two printers is one example of a typical shared working environment.

The A2x00 operation is simple, it receives data from an INPUT port, accepts it into the buffer and at the same time transfers it to the desired OUTPUT port. This means that a computer can quickly clear its data into the A2x00 and gets on with other tasks while the A2x00 delivers that data to a slower output device.

Any port may direct its data to any other port, allowing total flexibility. The standard ports on the A2x00 include Centronics parallel and RS-232 Serial ports as standard and RS-422 Serial as an option.

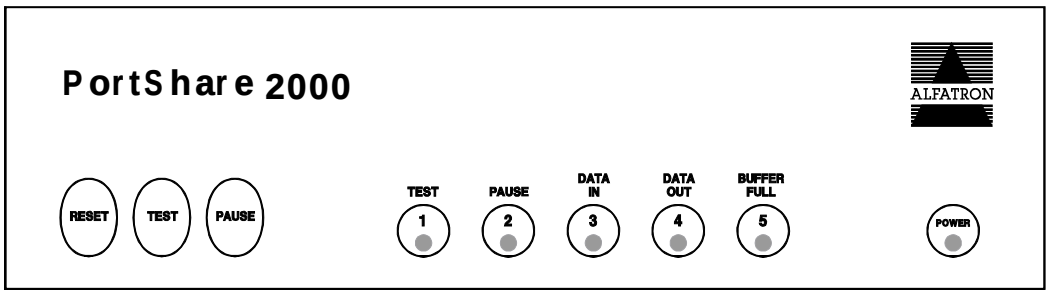
Software is provided with the A2x00 for both the Setup and Control of the unit. This easy to use software is supplied in DOS and WINDOWS formats. For computers not using DOS, simple ASCII Commands are available to allow Setup and Control from within application software or via batch files. All Setup configuration changes are stored in Non-Volatile memory within the A2x00.

Because the A2x00 is designed to be as versatile as possible we recommend that you read this manual carefully before installing your powerful new A2x00.

1.2 USER INTERFACE

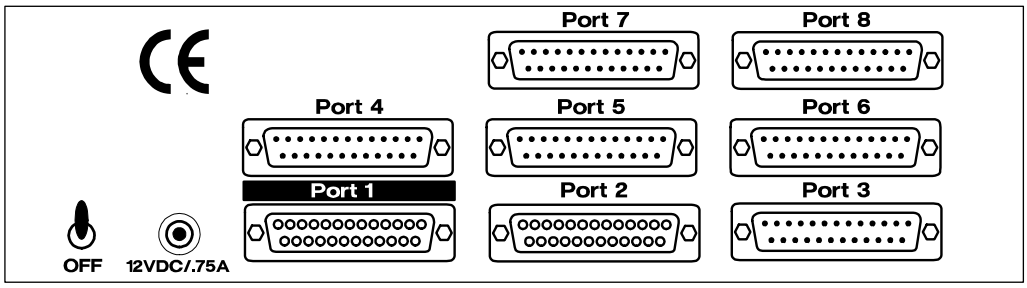
A2x00 Control Panel

The A2x00 Control Panel consists of three pressure sensitive buttons and six status Light Emitting Diodes (LEDs). For a complete description of the Control Panel operation of the Control Panel is in Section 3.



A2000 Rear Panel

The A2000 has Serial and Parallel connectors on its rear panel. All Serial ports use DB-25 Male connectors while the Parallel ports use DB-25 Female connectors. Ports are numbered as follows:

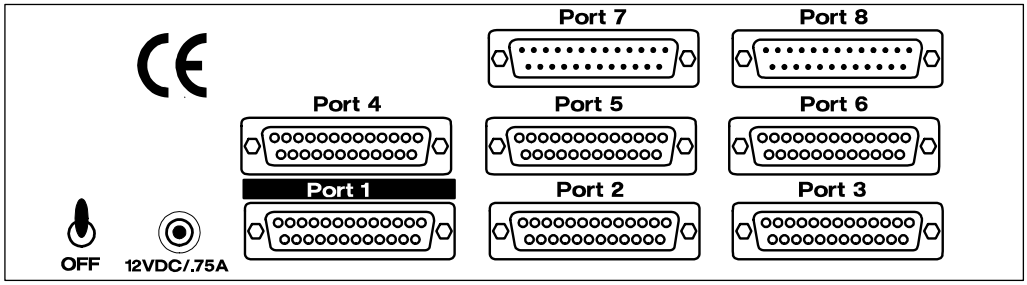


A2000 Rear Panel

- Ports 1 and 2 are 'Input' or 'Output' selectable Parallel ports
- Ports 3, 4, 5, 6, 7 and 8 are RS-232 Serial ports
- Ports 3 and 6 may be optioned as RS-422 Serial ports

A2100 Rear Panel

The A2000 has Serial and Parallel connectors on its rear panel. All Serial ports use DB-25 Male connectors while the Parallel ports use DB-25 Female connectors. Ports are numbered as follows:



A2100 Rear Panel

- Ports 1 and 4 are dedicated 'Output' Parallel ports
- Ports 2 and 5 are 'Input' or 'Output' selectable Parallel ports
- Ports 3 and 6 are dedicated 'Input' Parallel ports
- Ports 7 and 8 are RS-232 Serial ports
- Ports 7 and 8 may be optioned as RS-422 Serial ports

☞ The A2000 and A2100 are factory shipped with port 1 as an 'Output' port.

1.3 Features

- Intelligent eight Port Sharing device with up to 8Mb of buffer.
- 'Dynamic Buffer Memory Allocation' feature allows simultaneous data transfer from multiple 'inputs' to 'outputs'.
- Super-fast throughput for the transfer of large graphics data files - transfer rate is greater than 40,000 characters per second.
- Eight ports in combinations of RS-232 Serial, Centronics Parallel and RS-422 Serial industry standard protocols.
- Automatic conversion of ‘Serial to Parallel’ and ‘Parallel to Serial’.
- All Serial ports are fully bi-directional.
- Setup software for the DOS & WINDOWS environments allows the unit to be configured from any PC. All Setup configuration settings are stored in Non Volatile Memory (NOV RAM).
- Non-dedicated parallel ports perform full bi-directional data transfer when used with Alfatron Setup and Control software.
- Control software for the DOS & WINDOWS environments allows total user control for the operation of the A2x00.
- Simple ASCII COMMANDs allow Setup and Control to be performed from non-DOS or WINDOWS environments.
- Buffer memory may be any combination of 256 Kbyte, 1Mbyte or 4Mbyte 30-pin SIMM Memory up to a maximum of 8Mb.
- Up to four A2x00s may be chained together to expand the number of port connections.
- Visual LED display of buffer usage including buffer full display.
- Extensive Status Reporting and Diagnostic Functions.
- Full Setup and Performance Reports to any output port.
- Support for printer language changes with fixed time delay between print-jobs.
- Full ASCII COMMAND and String handling facilities.
- Designed and Manufactured in Australia.

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2 INSTALLATION

2.1 A SIMPLE INSTALLATION

The A2x00 is factory shipped for immediate operation if there is only one output device. For example, if you have four PCs that would like to share one printer, simply plug the printer into 'Port 1' of the A2x00, connect the PCs to any other port**, turn on the A2x00 and start printing - there is nothing to configure.

** 'Port 4' on the A2100 is an exception. It cannot be used as an input in the example above as it is a parallel output only port.

Both the A2000 and A2100 are factory shipped with all ports directing their output to 'Port 1'. This port is uniquely identified on the rear panel.

2.2 SETTING UP FOR THE FIRST TIME

The A2x00 can be set up in many different port configurations, different from the example mentioned above. To do this your A2x00 ports must be configured to suit your particular application. The A2x00 is configured using the DOS or WINDOWS Setup Software supplied with the unit. If you wish to configure the A2x00 without DOS or WINDOWS software please refer to the Advanced Programming Section at the back of this manual.

Step 1 - Setup the A2x00 using a PC

With the A2x00 powered OFF, connect a PC to either parallel 'Port 2' or serial 'Port 8'. Use these ports with a new factory shipped A2x00. If the unit has previously been configured use a known INPUT parallel or serial port.

Load the PSD Setup software onto your PC in either the DOS or WINDOWS format, refer to Section 7. Complete the configuration of each port according to your application requirement.

- Always set a 'Timeout' on a port with a PC connected
- COMMAND processing should be 'Enabled' on a PC port
- A 'Timeout' value is recommended for a printer/plotter.

When your configuration is complete, ‘download’ the final setup to the A2x00, this will be stored in the NOVRAM of the A2x00. A file will automatically be created in the same directory as the Setup software. The file is called “PSD.CFG” (this is referred to as the “config file” in the PSD Setup software). This file contains all the names and details of the ports in this A2x00 setup.

Copy this same “PSD.CFG” file to all the other PCs connected to the A2x00. This file must be located in the same directory with the PSD Control software. This will ensure that all users have access to the same resources (names/ identification) for the Control software.

In some cases it may be necessary to alter the “PSD.CFG” for individual machines (using PSD Setup). For example, this will be the case when one PC uses the serial (COM1:) port for output instead of parallel (LPT1:) port used by other PCs.

Step 2 - Verify all Cable Requirements

Check all equipment to be connected to the A2x00 and make sure that the cabling is correct. Refer to Sections 13 and 14 for detailed information on cabling. Please ensure that all external serial devices have identical serial port settings to those of the A2x00. If in doubt, print a ‘Setup’ Report from the A2x00 to confirm these settings, refer to Report Section.

Step 3 - Connect all equipment to the A2x00

Make sure that all equipment is powered OFF. Carefully install and secure all cables to the A2x00 and other equipment, loose cabling will cause problems.

Step 4 - Power ON Sequence

When all equipment is connected, power on the equipment in the following sequence. Power ON the computers first. Next, power ON the A2x00. Finally, power ON all printers. This is the recommended power up sequence. Unwanted noise data may be generated if this sequence if not followed.

Note: It is important that printers attached to the A2x00 be connected and powered on at all times.

2.3 SETUP A PRE-CONFIGURED A2x00

If an A2x00 has been setup before and you are unsure of its configuration then it is a simple matter to produce a Setup Report. Instructions for producing this report are in the Report Section of this manual.

For the A2000, simply connect a serial printer to 'Port 8' and direct the 'report' output to port 8. If a serial printer is not available the output may be directed any terminal program on a PC.

For the A2100, simply connect a parallel printer to 'Port 1' and direct the 'report' output to port 1.

3 USING THE CONTROL PANEL

The A2x00 Control Panel shown in Section 1.2 has three pressure sensitive buttons labeled 'RESET', 'TEST' and 'PAUSE'. When these buttons are pressed in certain combinations they envoke different 'MODE's of operation.

Each 'MODE' of operation makes use of the display LEDs. These 'MODE's and the function of the display LEDs is described below.

3.1 NORMAL DISPLAY MODE

'Normal Display' mode is the normal operating state of the A2x00. The A2x00 will always power up in this mode. In this mode the function of each LED is written above it on the Control Panel.

Power Indicates that the A2x00 is powered on. This LED turns OFF or flashes if the power supply voltage is low or if the main processor is not operating correctly. This LED will also extinguish if the RESET button is pressed.

Test This LED will stay ON when a Communication Error occurs, see 'Error Display' mode in this section for further details.

Pause When this LED is continuously ON or flashing, the A2x00 has stopped outputting data to a particular port or to all the output ports. This is activated by either the PAUSE button being pressed, or by using the Pause feature in the Control software for Windows or DOS. See 'Pause' mode under this section for further details.

Data In LED will flash when data is received by the A2x00.

Data Out LED will flash when data is transmitted by the A2x00.

Buffer Full This LED will stay ON when the A2x00 buffer memory is full. When the buffer memory is almost full (24Kbytes to spare), this LED will flash.

3.2 POWER UP SELF TEST MODE

When the A2x00 is first powered ON, it will perform a Power Up Self Test. In this test the EPROM, RAM and DRAM are all tested in two cycles, if an error occurs during this Power Up Self Test one or more LEDs will flash. If this is the case then the A2x00 is not performing correctly, please contact your Dealer for further information.

3.3 ERROR DISPLAY MODE

When in ‘Normal Display’ mode, if the Test LED lights up then an error has occurred. To place the A2x00 into ‘Error Display’ mode, press the TEST button once and refer to the table below for the 'Error Type':

LED	Error Type	Description / Action
1	Parity	On one or more of the serial ports, one or more parity errors have occurred.
2	Framing	On one or more of the serial ports, one or more framing errors have occurred.
3	Overrun	On one or more of the serial ports, one or more overrun errors have occurred.
4	Buffer Overflow	Due to a 'flow control' failure, one or more input buffers have overflowed and data loss has occurred.
5	(a) I/O Test Error	An I/O test error has occurred. Check for RAM and I/O functionality on all ports. Only valid when I/O self-test is in progress.
	(b) Command FIFO Overflow	A handshaking problem has led the A2x00 to miss some commands on the input port. This error only valid when self-test is not running.

Return to ‘Normal Display’ mode by pressing the TEST button four more times, or if the TEST button is not pressed for 1 minute, the display will time out and automatically return to ‘Normal Display’ mode.

3.4 PAUSE MODE

This key sequence only applies when in ‘Normal Display mode’

If the 'Pause' LED is extinguished: to Pause ALL output (Global Pause) activity of the A2x00, press the PAUSE button once.

If the 'Pause' LED is flashing: this indicates that one or more local pause(s) have been activated by A2x00 Commands. Press the 'PAUSE' button once to exit these ports from ‘Pause’ mode.

If the 'Pause' LED is ON and not flashing: this indicates that the Global Pause function is active. Press the PAUSE' button once. If any local pauses are active, the Pause LED will now start flashing. Press the 'PAUSE' button once again to resume the local pauses.

3.5 INPUT PORT ACTIVITY MODE

When in ‘Normal Display’ mode, press the TEST button twice to enter ‘Input Port Activity’ mode. In this mode the Control Panel LEDs will correspond to the activity on the Input Ports as indicated in the tables below:

A2000 LED Port Assignment				
TEST	PAUSE	DATA IN	DATA OUT	BUFFER FULL
Port 1 Port 2	Port 3 Port 8	Port 4	Port 5	Port 6 Port 7

A2100 LED Port Assignment				
TEST	PAUSE	DATA IN	DATA OUT	BUFFER FULL
Port 1 Port 6	Port 2 Port 5	Port 3 Port 4	Port 7	Port 8

To return to ‘Normal Display’ mode from ‘Input Port Activity’ mode simply press the TEST button three times. If the TEST button is not pressed for 1 minute, the display will automatically return to ‘Normal Display’ mode.

3.6 OUTPUT PORT ACTIVITY MODE

When in ‘Normal Display’ mode, press the 'TEST' button three times to enter ‘Output Port Activity’ mode. In this mode the Control Panel LEDs will indicate the activity on the Output Ports, refer to tables in 3.4 above.

To return to ‘Normal Display’ mode from ‘Output Port Activity’ mode simply press the 'TEST' button two times. If the 'TEST' button is not pressed for 1 minute, the display will automatically return to ‘Normal Display’ mode.

3.7 BUFFER USAGE MODE

When in ‘Normal Display’ mode, press 'TEST' button four times to enter ‘Buffer Usage’ mode. In this mode the Control Panel LEDs will indicate the amount of buffer currently in use. Each LED will light up, in turn, when another 20% of the memory is used. The first 20% usage will be indicated by the 'TEST' LED.

When all five Control Panel LEDs are alight the buffer is full. If all LEDs are alight but the 'BUFFER FULL' LED is flashing, then the buffer has only 24K bytes of available memory.

To return to ‘Normal Display’ mode from ‘Buffer Usage’ mode press the 'TEST' button once. If the 'TEST' button is not pressed for 1 minute, the display will automatically return to ‘Normal Display’ mode.

3.8 RESET MODE

Pressing the 'RESET' button will cause the A2x00 to temporarily enter ‘Reset’ mode. This is indicated by all LEDs being ON and the 'POWER' LED being OFF. The A2x00 will be reset to the settings stored in the Non Volatile (NOV RAM) memory and the buffer memory will be cleared. Once the reset is complete, all LEDs will go OFF and the 'POWER' LED come ON. The A2x00 is then in ‘Normal Display’ mode and ready for use.

3.9 MEMORY TEST MODE

To enter 'Memory Test' mode, press the 'RESET' and 'TEST' buttons simultaneously. Release the 'RESET' button and wait for the 'POWER' LED to come on before releasing the 'TEST' button.

To exit from this mode at any time, press 'RESET'.

'Memory Test' performs eight cycles of four different buffer memory tests. These tests are performed on all the buffer memory installed in the A2x00, performing the following individual tests:

- **Test 1: (Memory Clear)** This test is indicated by the ‘Pause’ LED being on, and the ‘Data In’ and ‘Data Out’ LEDs flashing alternately.
- **Test 2: (Memory Load)** This test is indicated by the ‘Data In’ and ‘Data Out’ LEDs flashing alternatively, with all other LEDs extinguished.
- **Test 3: (Refresh Test)** This test is indicated by the ‘Buffer Full’ LED flashing and all other LEDs extinguished.
- **Test 4: (Memory Verify)** This test is indicated by the ‘Test’ LED being on with the ‘Data In’ and ‘Data Out’ LEDs flashing alternately.

To indicate that the A2x00 has satisfactiorily passed the memory test, all LEDs will flash alternately from right to left. To exit from ‘Memory Test’ mode and resume normal operation simply press the 'RESET' button, ‘Normal Display’ mode is then resumed.

If an error occurs, the Control Panel LEDs will flash repeatedly. In this case, please contact your Dealer for further information.

4 REPORTS

4.1 PRODUCING REPORTS

In ‘Normal Display’ mode, press the 'PAUSE' and 'TEST' buttons simultaneously. This will place the A2x00 into ‘Report’ mode with 'Port 1' selected as the output Port. This report will contain information on the configuration and error status of the A2x00.

To choose a different port simply press the 'TEST' button once for 'Port 2', twice for 'Port 3', three times for 'Port 4', etc. If the 'TEST 'button is pressed a total of eight times it will return to 'Port 1'.

Note: Reports may only be directed to 'OUTPUT' ports, e.g. 'Port 3' of the A2100 is not a valid port for reports.

After selecting the desired output port, press the 'PAUSE' and 'TEST' buttons simultaneoulsy once more to activate the report print.

4.2 REPORT TYPES

Setup Report

The 'Setup' Report shows the configuration and settings of the A2x00 that are loaded from the NOVRAM at power up. These settings are generated by the user during the software Setup procedure and stored in the A2x00 NOVRAM.

Scratchpad Report

The 'Scratchpad' Report has a similar format to the 'Setup' Report but shows the contents of the Scratchpad Work Area. The Scratchpad Work Area contains all setting and configuration changes which have not yet been stored into the NOVRAM by the ‘NOVWRITE’ Command. This report is useful for checking the progress of an A2x00 Setup procedure being implemented via ASCII COMMANDS. The contents of the Scratchpad will become the permanent Setup settings when the ‘NOVWRITE’ Command is sent to the A2x00.

I/O Error Report

The 'I/O Error Report' will show all errors which have occurred on individual ports since power up of the A2x00. This report is particularily useful for finding problems with cabling and other equipment malfunctions.

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5 SETUP and CONTROL SOFTWARE

The A2x00 is supplied with two versions of PC software, one for DOS and one for WINDOWS. Each version contains one program to 'Setup' the A2x00 and a second program to 'Control' the A2x00 once it has been installed.

The first program, "PSDSETUP.EXE", is used to 'Setup' the A2x00, and define which ports are Input and Output, name individual ports and configure the various settings of serial ports.

The second program, "PSDCTRL.EXE" is a 'Control- program used for re-directing output to different ports, deleting print-jobs etc. "PSDCTRL.EXE" is not a Terminate & Stay Resident (TSR) program,it is loaded from disk every time the user requires it in DOS (WINDOWS users may load PSDCTRL once, and minimise it by using mouse or hot-key, refer to your WINDOWS manual for further instruction). A cut-down version of "PSDCTRL.EXE" is found in the DOS-only version of POPUP which is described later in this section.

Note: The Setup and Control software has an extensive help facility, if you would like more information on a particular subject, press F1 anytime.

5.1 Installation instructions for Windows:

1. Insert the diskette marked ‘WINDOWS Software’ into the disk drive.
2. Load WINDOWS and activate the File Manager.
3. Select the disk drive with the ‘WINDOWS Software’ diskette inserted.
4. ‘Double click’ program "SETUP.EXE" in the Main directory of the diskette.
5. Carefully follow the instructions provided by the installation procedure.
6. The Installation program will create a Window for the PSD software.
7. Exit from File Manager.

5.2 Using PSD Setup Software in WINDOWS

- ‘double click’ the icon (Alfatron logo) named “PSD Setup”.

If the Setup software is not required, delete the ‘PSD Setup’ icon by selecting the icon (one click of the mouse button) and use the ‘Delete’ option from the File Menu, or press the DEL key. To save hard-disk space, users not requiring the Setup option may remove the ‘PSDSETUP.*’ files from the directory by using File Manager.

Note: If you are using a Parallel Line Extender or other equipment between the A2x00 and your PC refer to the Advanced Programming Section.

5.3 Using PSD Control Software in WINDOWS

- ‘double click’ the icon (Alfatron logo) named “PSD Control”.

5.4 Installation Instructions for DOS

1. Insert the diskette marked 'DOS Software' into a disk drive and log into that drive (i.e. type 'A:' at the DOS prompt).
2. Type the command 'SETUP C:' to install the DOS based software onto the hard drive 'C:' The 'C:' may be replaced by another drive if required.
3. Follow the instructions given by the installation batch file.
4. A program called 'PSDPOPUP.EXE' will also be installed. (See section 14 for further information)

Using Monochrome Screens

- If using a monochrome screen, at the DOS prompt, type ‘PSDxxxxx /mda’, when in the directory ‘C:PSDDOS>’.

Help File for DOS

- To get help on the Command line, at the DOS prompt, type ‘PSDSETUP /?’, when in the directory ‘C:PSDDOS>’.

Using PSD Setup Software in DOS

- At the DOS prompt type “PSDSETUP” when in the directory ‘C:\PSDDOS>’.

Note: The Setup & Control software has extensive help facility, if you would like more information on a particular subject, just press F1 at any time.

Using PSD Control Software in DOS

At the DOS prompt type ‘PSDCTRL’ when in the directory ‘C:\PSDDOS>’.

5.5 POP UP SOFTWARE

Memory Resident (TSR) software is supplied on the ‘DOS Software’ diskette. Changes made by this software are temporary and will not be stored in the NOV RAM. However, their effect will remain until the A2x00 is RESET or switched 'OFF', or until a counteracting COMMAND is sent.

Note: Popup Up software is not intended or recommended for use in Windows or any Graphical environment.

The software is designed to be loaded and remain memory resident. It is activated by pressing the key combination 'ALT' and '.' together on the PC.

To load the software, type ‘PSDPOPUP’ at the DOS prompt when in the directory of the Alfatron configuration software. The Popup software will automatically load the “PSD.CFG” file created from the configuration of the unit using PSD Setup under DOS or Windows. The ‘PSDPOPUP’ command may be included in the “AUTOEXEC.BAT” file for automatic use.

5.6 Using COMMANDs for Setup

The A2x00 may also be set up using COMMANDs. Below are listed the COMMANDs for the Factory Default Settings for the A2000 and A2100.

These COMMANDs may be sent to the A2x00 from any device which can transfer ASCII data. The A2x00 will accept each COMMAND and process it internally.

A2000 Factory Setup COMMANDS

```
@Z@ NOVREAD;
@Z@ SETPORT 1 PRN 1 5S DIS DIS DIS DIS DIS;
@Z@ SETPORT 2 CPU 1 20S DIS EN DIS DIS DIS;
@Z@ SETPORT 3 CPU 1 20S DIS EN DIS DIS DIS;
@Z@ SETPORT 4 CPU 1 20S DIS EN DIS DIS DIS;
@Z@ SETPORT 5 CPU 1 20S DIS EN DIS DIS DIS;
@Z@ SETPORT 6 CPU 1 20S DIS EN DIS DIS DIS;
@Z@ SETPORT 7 CPU 1 20S DIS EN DIS DIS DIS;
@Z@ SETPORT 8 CPU 1 20S DIS EN DIS DIS DIS;
@Z@ SETSERIAL 3 9600 DIS 8 1 DTR;
@Z@ SETSERIAL 4 9600 DIS 8 1 DTR;
@Z@ SETSERIAL 5 9600 DIS 8 1 DTR;
@Z@ SETSERIAL 6 9600 DIS 8 1 DTR;
@Z@ SETSERIAL 7 9600 DIS 8 1 DTR;
@Z@ SETSERIAL 8 9600 DIS 8 1 DTR;
@Z@ SETSTRING 1 0;
@Z@ SETSTRING 2 0;
@Z@ SETSTRING 3 0;
@Z@ SETSTRING 4 0;
@Z@ NOVWRITE;
@Z@ RESET;
```

A2100 Factory Setup COMMANDS

```
@Z@ NOVREAD;
@Z@ SETPORT 1 PRN 1 5S DIS DIS DIS DIS DIS;
@Z@ SETPORT 2 CPU 1 20S DIS EN DIS DIS DIS;
@Z@ SETPORT 3 CPU 1 20S DIS EN DIS DIS DIS;
@Z@ SETPORT 4 PRN 1 5S DIS DIS DIS DIS DIS;
@Z@ SETPORT 5 CPU 1 20S DIS EN DIS DIS DIS;
@Z@ SETPORT 6 CPU 1 20S DIS EN DIS DIS DIS;
@Z@ SETPORT 7 CPU 1 20S DIS EN DIS DIS DIS;
@Z@ SETPORT 8 CPU 1 20S DIS EN DIS DIS DIS;
@Z@ SETSERIAL 7 9600 DIS 8 1 DTR;
@Z@ SETSERIAL 8 9600 DIS 8 1 DTR;
@Z@ SETSTRING 1 0;
@Z@ SETSTRING 2 0;
@Z@ SETSTRING 3 0;
@Z@ SETSTRING 4 0;
@Z@ NOVWRITE;
@Z@ RESET;
```

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6 ADVANCED PROGRAMMING

6.1 SENDING A2x00 COMMANDs

The A2x00 COMMANDs allow various Setup and Control functions to be performed. If it is not possible to use the supplied PSD Setup and Control software for Windows or DOS, one of 3 methods may be used to issue COMMANDs.

In Batch Files

Using a word processor or text editor, create a file containing one or more COMMANDs. This file may be sent to the A2x00 at any time to perform those functions.

The DOS Software Disk supplied with the A2x00 contains examples of batch files in a directory called '\BATCH'. Using the examples as a guide, create batch files and name them to suit the application (e.g. 'LASER.BAT' and 'MATRIX.BAT' to represent a Laser printer and Dot-Matrix printer).

Included in Data Files

Include a COMMAND as one of the lines of text in a data file. When this file is sent to the A2x00 the line containing the COMMAND will be trapped and processed. All other data will be passed through the A2x00 and sent to its destination.

Note: This method is only recommended for strictly ASCII files on systems with simplistic printer drivers. Use of this practice under WINDOWS and DOS applications using specialised printer drivers is not recommended.

Via Pop Up Software

The MS-DOS Pop Up software, supplied with the A2x00, may be loaded into the computer memory and then activated at any time by using the key sequence 'ALT' and '.' together. This is a convenient, but temporary, method of sending COMMANDs to the A2x00 while operating within a software package. Changes made using Pop Up are NOT saved in NOV RAM. For more details refer to Section 5.5.

Note: Pop Up software is not intended or recommended for use in Windows or any Graphical environment.

6.2 RULES FOR A2x00 COMMANDs

- each COMMAND and its Parameters **must** be sent in UPPER CASE ASCII.
- each COMMAND may contain none, one or more Parameters.
- each COMMAND and Parameter must be separated by one or more spaces.
- each COMMAND must be preceeded by a LEADIN sequence eg: “@Z@”. Refer to the LEADIN character.
- each COMMAND must be terminated by the “;” (semi-colon) character.
- COMMANDs will NOT be processed unless COMMAND Processing is enabled for the port on which the commands will arrive.
- some COMMANDs are saved in the NOV RAM while others are not. Please refer to the individual COMMANDs for this information.
- COMMANDs that are intended to permanently configure the A2x00 must be encapsulated in the following commands:

  @Z@ NOVREAD;
  ... Configuration Commands ....
  @Z@NOVWRITE;
  @Z@ RESET;

- The changes made in the Configuration commands will not become active until after the RESET command. Please allow 5 seconds for the RESET command to take affect before proceeding.
- All responses from the A2x00 are encapsulated in the ‘<‘ and ‘>’ characters.

6.3 COMMANDs

The A2x00 Commands are described in detail in this Section and appear in the following order:

CONNECT	Connection to a specified port
GETHARDWARE	Return details of hardware
GETCONNECTION	Which port am I connected to?
GETPORT	Read Port Settings
SETPORT	Write Port Settings
GETSERIAL	Read Serial Port Configuration
SETSERIAL	Write Serial Port Configuration
GETSTRING	Read String Contents
SETSTRING	Write String Contents
HEXDUMP	Enter HEXDUMP mode
ENDHEXDUMP	Exit HEXDUMP mode
KILL	Disable Command Processing
LEADIN	Change Lead-in character
NOVREAD	Read the contents of the NOVRAM
NOVWRITE	Write to the NOVRAM
PAUSE	Pause outputs
RESUME	Restarts the paused output
RESET	Perform Hardware Reset
DELETE	Delete your jobs in the buffer
TIMEOUT	Set Timeout

Command: **CONNECT**

Format: @Z@ CONNECT [X_1] X_2;

Parameter: [X_1] an optional Source port number, range “1” to “8” X_2 a Destination port number, range “1” to “8”

Description: Make a connection to the port specified in the parameter/s. When 2 parameters are specified then those 2 ports will be connected together. Only valid ports may be specified.

Example 1: “@Z@ CONNECT 3;” will connect the port sending this Command to Port 3.

Example 2: “@Z@ CONNECT 2 7;” will establish a connection between Port 2 and Port 7.

Note: this is NOT saved in NOV RAM

Command: **GETCONNECTION**

Format: @Z@ GETCONNECTION [X];

Parameter: [X] is an optional port number, range “1” to “8”

Description: If the “parameter” is omitted, the A2x00 will return to the ‘sending’ port, the port number on which the Command arrived and the port number to which this port is connected.

If the “parameter” is included, the A2x00 will return to the ‘sending’ port, the port number specified by the “parameter” and the port number to which the “parameter” port is connected.

The format for the returned string will be:

<X1 X2;> where X1 is the source port and X2 is the port to which it is connected.

Example 1: When “@Z@ GETCONNECTION;” is sent by a terminal on Port 1, then the A2x00 will return to the terminal, “<1 3;>”. This means that Port 1 is connected to Port 3.

Example 2: When “@Z@ GETCONNECTION 2;” is sent by a terminal on Port 1, then the A2x00 will return to the terminal, “<2 4;>”. This means that Port 2 is connected to Port 4.

Note: this is NOT saved in the NOV RAM

Command: **GETPORT**

Format: @Z@ GETPORT [X];

Parameter: [X]: is an optional port number “1” to “8”

Description: This Command will return the Port Type Settings for the “parameter” port specified. If a “parameter” is not specified, the Settings will be returned to the port on which the Command arrived. Format is as follows:

“<X typ dst tim pse cmd grp pre pst;>”.

Refer to “SETPORT” for details on these settings.

Example: “@Z@ GETPORT 2;” will respond with the string: “<2 CPU 3 20S DIS EN DIS DIS DIS;>”, this assumes that the Example in the SETPORT Command was issued before this Example.

Command: **SETPORT**

Format: @Z@ SETPORT X typ dst tim pse cmd grp pre pst;

Parameters: X port number (1 to 8)

typ port type (CPU PRN TRM PLT MDM UNI)

dst default destination port (1 to 8)

tim timeout value (refer to TIMEOUT Command)

pse default pause state (DIS or EN)

cmd default Command enable (DIS or EN)

grp printer group designation (DIS or 1 to 4)

pre pre-append string number (DIS or 1 to 4)

pst post-append string number (DIS or 1 to 4)

Description: This Command will reset the port settings to the values specified in the parameters above. The values are shown above in brackets (value). Refer to “NOVWRITE” command.

Example: “@Z@ SETPORT 2 CPU 3 20S DIS EN DIS DIS DIS;” will set Port 2 as a computer (CPU) port, destination 3, timeout 20 Seconds, pause disabled, commands enabled, printer grouping disabled, and pre and post append strings disabled.

Command: **GETSERIAL**

Format: @Z@ GETSERIAL [X];

Parameter: [X]: optional port number '3', '4', '5', '6', '7' or '8'.

Description: This Command will return the Serial Port settings for the "parameter" port specified. If a "parameter" is not specified, the Settings will be returned to the port which issued the Command. Format is as follows:

"<X bit-rate parity bits stop-bits shake;>".

See Command "SETSERIAL" for details on fields.

Example: "@Z@ GETSERIAL 8;" will return the following string: "<8 38K4 DIS 8 1 XRB;>", assuming the Example in the SETSERIAL Command was issued before this Example.

Command: **SETSERIAL**

Format: @Z@ SETSERIAL X bps par bit stp flw;

Parameter: Xport number '3', '4', '5', '6', '7' or '8'.

bps bits per second (300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 76800)

Note: 76800 only available on ports 7 and 8

par parity (DIS, ODD or EVN)

bit bits per character (7 or 8)

stp stop bits (1 or 2)

flw flow control (DTR, XNB, XRB, XNU, XRU)

Refer to Section 15 for Flow Control.

Description: This Command will reset the serial port settings to the values specified in the parameters above. The values are shown above in brackets (value). Refer to "NOVWRITE" command.

Example: "@Z@ SETSERIAL 8 38K4 DIS 8 1 XRB;" will set Port 8 to run at 38,400 bits per second, with parity disabled, 8 bits per character, 1 stop bit and Robust Bi-directional XON/XOFF flow control.

Command: **GETSTRING**

Format: @Z@ GETSTRING S;

Parameter: S: is the string number “1” to “4”

Description: This Command will return the String contents in hexadecimal representation for the given string “S” in the following format:

“<S yy zz zz zz zz... ;>”.

See Command “SETSTRING” for details on fields.

Example: “@Z@ GETSTRING 1;” will return the following string: “<1 5 68 65 6C 6C 6F;>”, assuming the Example in the SETSTRING Command was issued before this Example.

Command: **SETSTRING**

Format: @Z@ SETSTRING S yy zz zz zz...;

Parameter: S String Number (1 to 4)

yy Number of characters (0 to 80)

zz Hexadecimal value of string contents.

Description: The Command will load a string with the specified contents. Each ASCII character must be represented by 2 Hexadecimal characters. For example, a line feed character must be entered as “0A” not just “A” to be interpreted correctly by the A2x00. Refer to “NOVWRITE” command.

Example: The Command “@Z@ SETSTRING 1 5 68 65 6C 6C 6F;” will assign the ASCII string “hello” to String number 1.

IMPORTANT NOTE: “SET” Commands will only be saved in the NOVRAM if they are immediately followed by the “@Z@ NOVWRITE;” and “@Z@ RESET;” Commands.

Command: **HEXDUMP**

Format: @Z@ HEXDUMP X;

Parameter: X is an output port number, range “1” to “8”

Description: Sets the designated output port into 'Hexdump' mode and transmits the data in Hexadecimal format. This function is particularly helpful when debugging printing problems so that non-printable characters can be identified on the printed page.

The 'Hexdump' mode will time out, depending on the current timeout for the port, and revert back to 'Normal' mode. If an extended time is required in 'Hexdump' mode then a TIMEOUT Command must be used to extend the timeout period.

Example 1: “@Z@ HEXDUMP 3;” will cause the output on port 3 to start being printed in Hexadecimal format.

Note: this is NOT saved in NOV RAM

Command: **ENDHEXDUMP**

Format: @Z@ ENDHEXDUMP X;

Parameter: X is an output port number, range “1” to “8”

Description: This Command sets the designated output port back to NORMAL mode from HEXDUMP mode.

Example 1: “@Z@ ENDHEXDUMP 3;” will cause the output on port 3 to start being printed in Normal format.

Note: this is NOT saved in NOV RAM

Command: **KILL**

Format: @Z@ KILL:

Description: Disables COMMAND processing. Once this COMMAND is sent, no other COMMANDs will be recognised. COMMAND processing can only be re-enabled by pressing the RESET button.

Note: this is NOT saved in NOV RAM

Command: **LEADIN**

Format: @Z@ LEADIN C;

Parameter: C is the LEADIN character “@”, “**#**”, “$” or “%”.

Description: This Command sets the LEADIN sequence to contain the specified character.

Example 1: “@Z@ LEADIN **#**;” will cause the LEADIN sequence to now contain the **#** character (the LEADIN sequence has now become “**#Z#**”). Refer to NOVWRITE command.

Command: **NOVREAD**

Format: @Z@ NOVREAD;

Description: Reads the battery backed-up NOV RAM into an area called Scratch-Pad. Various Commands are then accepted and the appropriate modifications, to the configuration, are made to the Scratch-Pad.

After the configuration Commands are sent, a 'NOVWRITE' Command must be sent to write the Scratch-Pad back into the NOV RAM. If an erroneous configuration command is sent to the A2x00, the A2x00’s Scratch-Pad can be cleared by issuing the 'NOVREAD' Command.

Command: **NOVWRITE**

Format: @Z@ NOVWRITE;

Description: This command writes the contents of the Scratch-Pad into the NOV RAM. It should only be used after all configuration Commands have been sent. For the new configuration to take effect, a 'RESET' Command must follow this Command.

Command: **PAUSE**

Format: @Z@ PAUSE [X];

Parameter: [X] is an optional port number, range “1” to “8”

Description: If the optional port parameter is used, this Command halts all output from the specified OUTPUT port. It is useful for making paper changes to plotters and laser printers. To exit from the Pause state simply press the PAUSE button. Or use the appropriate “RESUME” command.

If the optional port parameter is not sent, the A2x00 port to which you are connected will enter pause mode at the conclusion of your next print-job (as determined by a time-out or a CONNECTION command). This is useful for paper changes in plotters at the conclusion of the plot.

Example 1: “@Z@ PAUSE;” will pause the output port of the A2x00 to which you are currently connected at the conclusion of the next print-job. All INPUT ports will still receive data. At the conclusion of the plot the user may then remove the Plot and new plotter paper may be inserted in a Plotter and then the PAUSE button depressed to enable further plotting.

Example 2: “@Z@ PAUSE 3;” will immediately stop all output from port 3. The Pause LED will flash indicating that an individual Pause is active. All INPUT ports will still receive data. Letterhead paper may be inserted in the laser printer on port 3 and then the PAUSE button depressed or the “@Z@ RESUME 3;” Command sent to enable printing.

Note: this is NOT saved in NOV RAM

Command: **RESUME**

Format: @Z@ RESUME X;

Parameter: X is an output port number, range “1” to “8”

Description: The RESUME command restarts a paused port. If the designated output port is not already paused, then this command will be ignored. The resume command will not restart the output ports if the PAUSE button on the front panel has been pressed (ie the PAUSE LED is on continuously in the Normal Display Mode).

Example 1: “@Z@ RESUME 3;” will resume output on port 3. If Port 3 was not previously paused with a “@Z@ PAUSE 3;” or “@Z@ PAUSE;” command, then the resume command will be ignored.

Note: this is NOT saved in NOV RAM

Command: **RESET**

Format: @Z@ RESET:

Description: This will force the A2x00 to perform a full hardware reset and return to default settings. This is equivalent to pressing the RESET button on the front panel.

Warning: all data in the A2x00 will be lost.

Command: **DELETE**

Format: @Z@ DELETE;

Description: This will delete all files which have been sent to the A2x00 through the port which sends this Command.

Command: **TIMEOUT**

Format: @Z@ TIMEOUT <value>

Parameter: <value> is a timeout value from 0 to 60 Minutes.

The values for this field are as follows:

“DIS” = timeout Disabled
“5S” = 5 seconds
“10S” = 10 seconds
“20S” = 20 seconds
“30S” = 30 seconds
“40S” = 40 seconds
“50S” = 50 seconds
“1M” = 1 minute
“2M” = 2 minutes
“5M” = 5 minutes
“10M” = 10 minutes
“20M” = 20 minutes
“30M” = 30 minutes
“40M” = 40 minutes
“60M” = 60 minutes

Description: This Command changes the Timeout value for the port which sent the Command. The Timeout is the method used by the A2x00 to distinguish between output jobs.

Note: this Command is NOT saved in the NOV RAM

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7 TECHNICAL DETAILS

7.1 FLOW CONTROL (Handshaking)

Hardware (DTR/DSR) Handshaking

Hardware, DTR/DSR, handshaking uses the Data Terminal Ready (DTR) and Data Set Ready (DSR) signal lines to control the flow of data between devices.

On the A2x00, DTR is an output signal line which, when high (+3V RS232 levels), indicates the A2x00 is ready to receive data. Conversely, a DTR low (-3V RS232 level) indicates the A2x00 is temporarily unable to receive data.

DSR is an input signal line which controls the output of the A2x00. A high level, (+3V RS232 level), indicates to the A2x00 that data may be sent to the connected device. A low level, (-3V RS232 level), indicates that data cannot be sent to the connected device.

This form of handshaking is recommended. DTR/DSR is the preferredmethod of handshaking under the DOS operating system.

Software (Xon/Xoff) Handshaking

Software handshaking uses special Xon (11 HEX) and Xoff (13 HEX) ASCII characters to control the flow of data to and from the A2x00. When using Xon/Xoff with RS232 levels, always leave DTR/DSR on the A2x00 unconnected. If using Xon/Xoff with RS422 levels on ports 1 and 2, always connect DTR+ to DSR+ and DTR- to DSR- (on the A2x00 end of the cable) to ensure reliable operation of the A2x00.

There are four variations of Xon/Xoff handshaking available in the A2x00:

1. Xon/Xoff Standard
2. Xon/Xoff Transmit Only
3. Xon/Xoff Standard Robust
4. Xon/Xoff Robust Transmit Only

Standard Xon/Xoff

The Standard Xon/Xoff setting uses Xon/Xoff handshaking in both directions. Therefore the A2x00 will send Xon/Xoff control characters to the connected device and will also absorb and use Xon/Xoff characters sent from the connected device. Xon/Xoff characters are sent only once. If the device connected to the A2x00 misses (due to corruption by electrical noise) an Xoff, the connected device will continue to send data and overflow the buffer of the A2x00. Alternately, a connected device missing an Xon can cause a “lock-up” situation where the A2x00 is ready to receive data, the connected device is ready to send data but the Xon character was missed. In this state the devices are locked.

Transmit Only Xon/Xoff

Transmit Only Xon/Xoff sets up the A2x00 to only send Xon/Xoff control characters to the connected device. The Xon/Xoff characters received by the A2x00 are treated as data and not flow control characters. This type of handshaking only allows communications in one direction (i.e. from a computer type device to the A2x00). The benefit of this form of handshaking is that the connected device may send Xon/Xoff characters, as part of a graphics data stream, and not have the A2x00 absorb and use these characters for handshaking purposes. It is common to use Transmit Only Xon/Xoff handshaking on an A2x00 port connected to a computer, capable only of Xon/Xoff handshaking, which requires the printing of graphics data.

Robust Xon/Xoff

Robust Xon/Xoff handshaking overcomes limitations in the Standard Xon/Xoff protocol by ensuring that the A2x00 device repeatedly sends Xon/Xoff characters to the connected device. If for example, an Xoff sent to the connected device becomes corrupted and the connected device does not receive it, the connected device may continue to send data to the A2x00 and overflow the buffer, resulting in data loss. The Robust handshaking setting will ensure that the Xoff character is repeated for every character received past the cut-off point of the A2x00's buffer. Also, when the A2x00 is receiving data, an Xon will be sent continuously (once every five seconds) to eliminate the possibility of a lock-up situation.

7.2 CABLE INFORMATION

Alfatron Pty Ltd recommends the use of shielded cable with all of its products. Shielding reduces Electro Magnetic Radiation and improves noise immunity. This helps minimise interference to other equipment and will improve the communications reliability.

Cable Construction

The recommended cable construction is as follows:

- Take the shield (surrounding cable wires) and solder it to the Frame Ground (FG) pin. If FG is not available, use Signal Ground (SG) but in this case always use a separate wire for ground which is connected at both ends.
- The shield must only be connected at both ends of the cable.

7.3 CABLE EXAMPLES

Diagram 1. Serial Cable for IBM PC/XT and PS/2

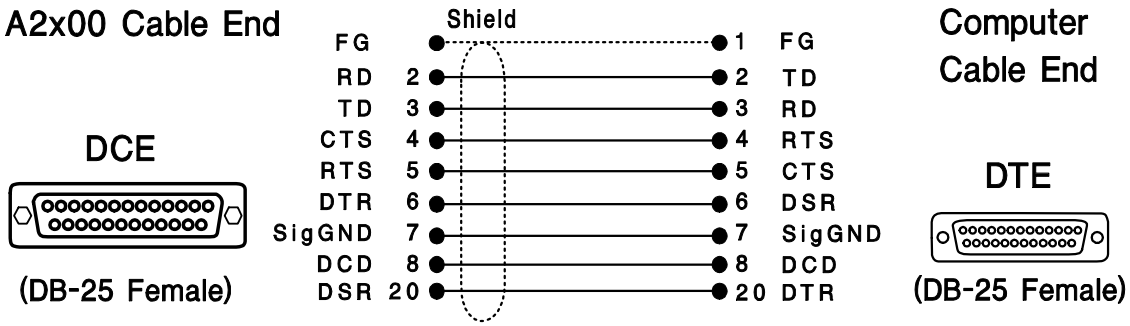


Diagram 2. Serial Cable for IBM AT

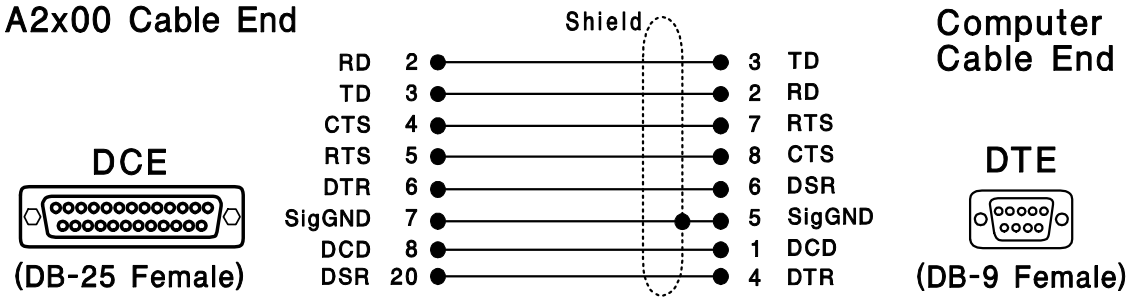
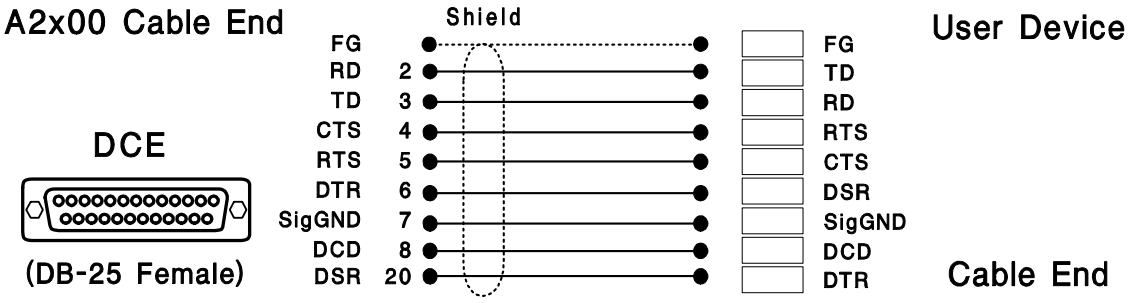


Diagram 3. Serial Cable for Other Devices



7.4 CABLE PIN ASSIGNMENTS

RS-232C Serial Port

The RS-232 Serial Ports of the A2x00 are configuired as DCE:

Pin	*Status*	*Signal*	*Description*
1	Used	FG	Frame Ground
2	Input	RD	Receive Data
3	Output	TD	Transmit Data
4	Not used - Pulled High	CTS	Clear To Send
5	Not used - Pulled High	RTS	Request To Send
6	Output	DTR	Data Terminal Ready
7	Used	SG	Signal Ground
8	Not used - Pulled High	DCD	Data Carrier Detect
20	Input - Pulled High	DSR	Data Set Ready
22	Not Used - Pulled High	RI	Ring Indicator

Note: Pins are pulled high to +9V via 10K resistor.

Centronics Parallel Ports

All A2x00 Parallel port pin assignments are as follows:

Centronics Port Pinout Female DB-25 Connector

Pin	*Signal*	*Pin*	*Signal*
1	Data Strobe (-)	14	Pulled High (4K7 _)
2	Data 0	15	Pulled High (4K7 _)
3	Data 1	16	Not Connected
4	Data 2	17	Ground
5	Data 3	18	Ground
6	Data 4	19	0 Volt
7	Data 5	20	0 Volt
8	Data 6	21	0 Volt
9	Data 7	22	0 Volt
10	Acknowledge (-)	23	0 Volt
11	Busy	24	0 Volt
12	Pulled Low (220)	25	0 Volt
13	Pulled high (4K7)		

8 SPECIFICATIONS

8.1 A2x00 GENERAL SPECIFICATIONS

CPU:	HD64180 operating at 12.288 Mhz
Memory:	256 Kb, 1Mb or 4Mb SIMM x 30pin may be used in any combination up to 8Mb.
A2000 Serial Ports:	RS-232C Standard on Ports 3, 4, 5, 6, 7 and 8.
A2100 Serial Ports:	RS-232C Standard on Ports 7 & 8.
All Serial Ports:	DB-25 male connector configured as DCE Xoff sent 32 bytes from end of buffer Xon sent 64 bytes from end of buffer
A2000 Parallel Ports:	CENTRONICS Parallel protocol Ports 1 & 2 - Select as INPUT or OUTPUT DB-25 female connector
A2100 Parallel Ports:	CENTRONICS Parallel protocol Ports 1 & 4 - OUTPUT only Ports 2 & 5 - Select as INPUT or OUTPUT Ports 3 & 6 - INPUT only DB-25 female connector
Power Supply:	12V (750mA) DC Plug Pack Fuse & Reverse Polarity protection Plug jack - 5.5mm outer/2.5mm inner
Switches:	Reset, Test and Pause
LEDs:	1. Test = RED 2. Pause = RED 3. Data In = GREEN 4. Data Out = GREEN 5. Buffer Full = RED Power = YELLOW
Dimensions:	71mm x 204mm x 254mm
Weight:	1.78 Kg
Operation Temperature:	10º to 35º C
Storage Temperature:	0º to 45º C

All specifications subject to change without notice

8.2 A2000 FACTORY SETTINGS

The A2000 is shipped from the factory with the following default port settings stored in NOVRAM:

Ports 2, 3, 4, 5, 6, 7 and 8 are set up as INPUTS:

Port type:	CPU (computer type)
Destination:	Port 1
Commands:	Enabled
Pause:	Disabled
Timeout:	20 Seconds
Pre-append string:	Disabled
Post-append string:	Disabled
Alternate Destination:	Not applicable

Port 1 is set up as an OUTPUT:

Port type:	PRN (printer type)
Destination:	Not applicable
Commands:	Not applicable
Pause:	Disabled
Timeout:	5 Seconds
Pre-append string:	Disabled
Post-append string:	Disabled
Alternate Destination:	Disabled

RS-232 Serial settings for ports 3, 4, 5, 6, 7 and 8:

Baud rate:	9600
Parity:	None
Data bits:	8
Stop bits	1
Flow Control:	DTR/DSR (Hardware handshaking)

Strings 1, 2, 3 and 4.

All Strings are empty.

8.3 A2100 FACTORY SETTINGS

The A2100 is shipped from the factory with the following default port settings stored in NOVRAM:

Ports 2, 3, 4, 5, 6, 7 and 8 are set up as INPUTS:

Port type:	CPU (computer type)
Destination:	Port 1
Commands:	Enabled
Pause:	Disabled
Timeout:	20 Seconds
Pre-append string:	Disabled
Post-append string:	Disabled
Alternate Destination:	Not applicable

Ports 1 and 4 are set up as an OUTPUT:

Port type:	PRN (printer type)
Destination:	Not applicable
Commands:	Not applicable
Pause:	Disabled
Timeout:	5 Seconds
Pre-append string:	Disabled
Post-append string:	Disabled
Alternate Destination:	Disabled

RS-232 Serial settings for ports 7 and 8:

Baud rate:	9600
Parity:	None
Data bits:	8
Stop bits	1
Flow Control:	DTR/DSR (Hardware handshaking)

Strings 1, 2, 3 and 4.

All Strings are empty.

8.4 RESET A2x00 TO FACTORY DEFAULT SETTINGS

The A2x00 unit can be reset to the original factory settings from the Control Panel. To do this, press and hold the PAUSE and TEST buttons simultaneously, then press and release the RESET button. Release the PAUSE and TEST buttons after the Power LED lights up.

Caution: All settings that you have configured using the Setup software for Windows or DOS will be lost.