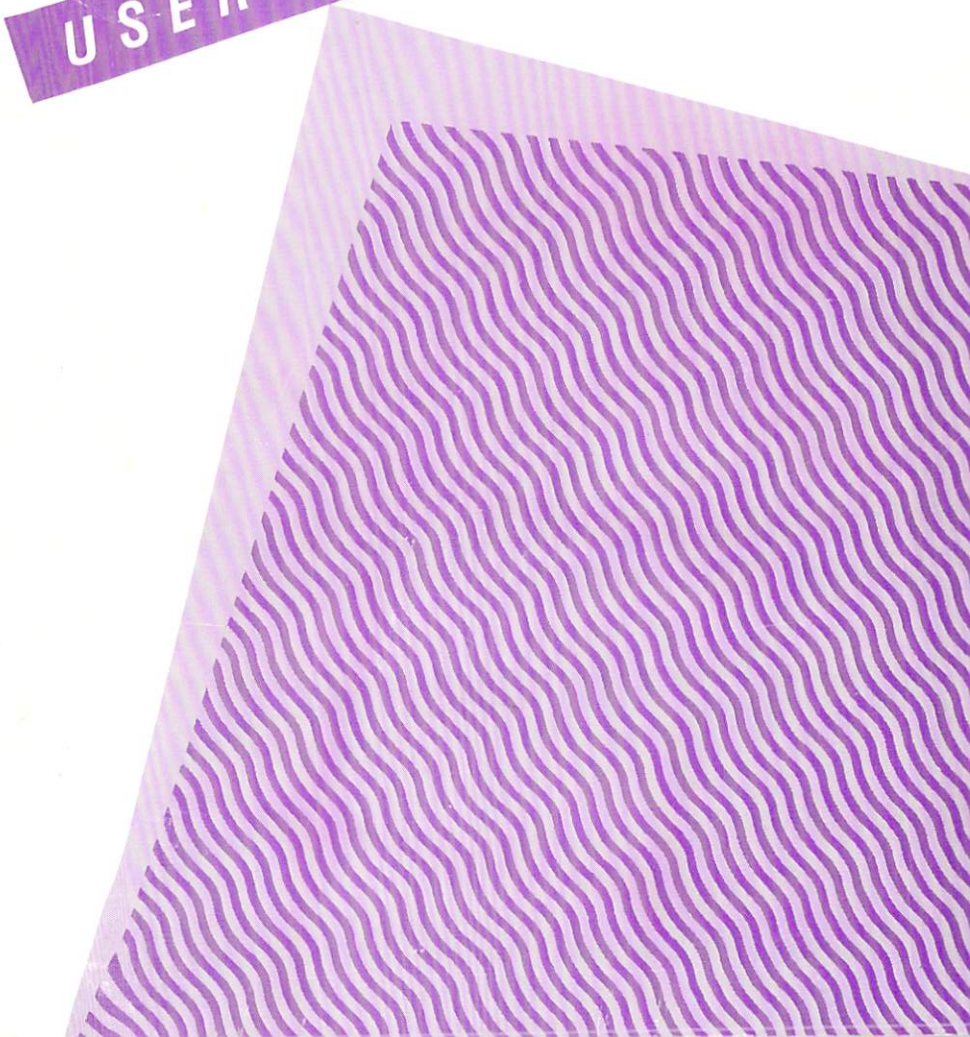
GVP/PC286

Powerful 286 PC Emulator for the Amiga 500

USER'S GUIDE



ADDENDUM

The following points were either not mentioned in the manual or were not stressed strongly enough and bear repeating:

1. During the installation of the PC286 board, check to make sure that all 100 pins of the mini-slot are correctly inserted into the connector on the PC286 unit. **Misalignment can cause serious damage to both the PC286 unit and the A500HD or A530 sub-systems.**

2. When reconnecting the case of the A500HD *(or the A530)* it is essential that you correctly connect the power wires for the fan. If you connect the wires and power on the unit, but the fan does not spin, then merely reverse the connection for the fan wires. The heat generated by the hard drive inside the plastic case can build up without the fan running causing the other components inside the case to fail.

3. When assigning RAM to the PC286 emulator, be sure to **reserve a minimum of 256 kilobytes for the Amiga's use under AmigaDOS**. Failure to do so may result in a total lockup of both machines.

xxxxxx-xx May, 1992

4. When assigning RAM to the PC286 emulator, be sure to use increments of **16 bytes**. MS-DOS makes certain assumtions about 'paragraphs' of RAM (16 byte chunks), but the configuration software allows any increment of RAM to be added. Setting the MS-DOS memory size to an unusual amount, such as 537kb, will most likely result in having MS-DOS programs fail or freeze when trying to load or allocate memory.

5. The GVP/PC286 emulator utilizes an actual 80C286 processor in almost exactly the same way as a standard PC clone. If a software compatibility issue arises, the vendor of the software package should be contacted first to see if there are any special requirements for running their software on a clone; **more often than not this is the case rather than a problem with the PC286 itself**.

6. When using the PC286 with a GVP A530-Turbo accelerator for the Amiga 500, it is important to have the 68030's **data caches turned off until after the PC286 is up and running**. Turning the cache on while the P286 is not running, and then attempting to start the PC286 will most likely cause the PC286 to freeze and crash.

GVP/PC 286 Emulator

16-MHz 80286 PC Compatibility

for the

GVP A500 HD

and

A530 Combo

Expansion Chassis.

TABLE OF CONTENTS

1. INTRODUCTION

GVP/PC286 is a high performance AT/PC compatible hardware emulation designed specifically for use with the GVP Series II A500 HD and A530 Combo expansions. Both of these GVP expansion products provide high-performance enhancement to the standard Amiga 500 in an easy to install, warranty-safe package.

Central to the design of both GVP A500 HD and A530 Combo expansions is a bus-direct Mini-Slot that provides additional expansion possibilities. The GVP/PC286 emulator board is the first peripheral designed to use this Mini-Slot.

The GVP/PC286 board converts your Amiga 500 into a fully compatible IBM AT "clone," which runs concurrently as a process under AmigaDOS. This means that the same multitasking Amiga can perform both AmigaDOS and MS/DOS operations simultaneously!

AT Performance

The GVP/PC286 emulator employs a 16 bit CMOS 80286 Central Processing Unit, running at 16 MHz. The board comes equipped with 512 kBytes of its own RAM and a socket for the addition of an optional 80C287-12 math coprocessor.

These features combine to give the GVP/PC286 board an impressive system performance rating. The popular Norton's Utilities evaluation of computing performance, SysInfo (*SI*), which compares the machine under test with the theoretical limits of an original IBM PC/XT, rates the GVP/PC286 board as equivalent to 15 XTs! That's performance comparable to many 386 machines currently on the market.

The GVP/PC286 board's use of low-power CMOS chips and advanced Very Large Scale Integration *(VLSI)* custom circuitry allow for an extremely compact and efficient layout and the GVP-licensed AT ROM/BIOS ensures full compatibility with virtually all existing AT applications.

System Configuration

With its 512 kilobytes of onboard memory, the GVP/PC286 board allows A500 systems with just 512k of original memory to function as a complete 640k MS/DOS system. The GVP/PC286 board can also recognize any additional FAST RAM and access it in either Extended or Expanded Memory models.

The GVP/PC286 support software allows for the partitioning and use of any SCSI hard drive connected to the A500 HD or A530 Combo SCSI controller as a DOS partition. This enables the board to boot directly into MS/DOS from hard disk and provides for almost unlimited storage of MS/DOS applications and data.

The GVP/PC286 emulation provides two different ways of working with hard drive resources. These will be detailed in ***Chapter 3. Configuration Options.*** Each method has its own benefits and it is possible to use both simultaneously on different partitions. Users will want to study this section and make some basic hard drive decisions before continuing with the installation.

2. PRODUCT IDENTIFICATION

- Fully compatible 16 MHz PC/AT emulator
- CMOS 80C286-16 CPU chip
- 512 kBytes onboard RAM
- Norton SI index of 15
- Socket for optional 80C287-12 math coprocessor
- Compact Surface Mounted Technology (SMT) circuit board for high integration, low power consumption and reduced cost
- Custom Very Large Scale Integration (VLSI) support chips for lower component count
- Fully AT compatible ROM/BIOS
- Full 640 kByte base memory as minimum standard configuration
- Ability to address additional FAST RAM as either Extended or Expanded Memory
- Runs unrestricted in '286 Protected Mode
- Supports Microsoft Windows 3.0
- Emulates EGA and VGA monochrome graphics, CGA 16-color graphics, Hercules, Olivetti and Toshiba 3100 display standards
- Works transparently with A500-based flicker eliminators

- Runs as a concurrent process within the AmigaDOS operating system
- Reads and writes MS/DOS file system on any standard Amiga floppy drive
- Full support for MS/DOS partitions on GVP Series II SCSI hard disks
- Recognizes the Amiga mouse as a Microsoft Serial mouse (on COM 1 or COM 2)
- Recognizes the Amiga's Parallel port as LPT1
- Recognizes the Amiga's Serial port as either COM 2 or COM 1 (depending on mouse setting)
- Emulates the PC/AT alert beep through Amiga audio hardware
- Recognizes and uses the Amiga's Real-Time clock
- Compatible with all versions of MS/DOS from 3.2 through 5.0, as well as DR-DOS 5.0 & 6.0
- Comes complete with GVP/PC286 board, User manual, AmigaDOS format System disk and PC format Utilities disk
- Customer support and periodic software updates through GVP's Technical Support service

Please read the file ***README.TXT*** on your GVP/PC286 distribution disk for any last minute changes or addenda to this document. This file can be read using the ***More*** utility under AmigaDOS or output to your chosen Preferences printer.

This manual describes the installation and operation of the GVP/PC286 board only. If you are not already familiar with the basic functionality of the Amiga 500, including use of the mouse to make menu selections and control screen operations, duplication of disks, etc., please read the manuals that came with your computer. For information on the formatting and partitioning of SCSI hard disks, refer to the GVP manuals that accompanied your A500 HD or A530 Combo expansion.

Note: This product is intended to be used with either the A500 HD or A530 Combo expansion products manufactured and sold by Great Valley Products. No other use is supported.

This product does not include the MS/DOS operating system, documentation on MS/DOS, or any DOS applications. The purchaser assumes full responsiblity for the legal acquisition and use of these properties.

Data Security

Before proceeding, make a copy of the GVP/PC286 distribution disk. The other disk, DOS Utilities, is in MS/DOS format and will be unreadable by your Amiga until the GVP/PC286 is running. As soon as you can, make a backup copy of it. Keep the original disks in a safe place. The manual that comes with an Amiga will describe how to make disk copies under AmigaDOS. A standard MS/DOS reference will describe the process of copying disks under that operating system.

If your A500 HD has been in service as a SCSI controller and you already have one or more partitions of data on a hard disk, it is strongly advised that you do a complete system backup before proceeding to install the GVP/PC286 board. The GVP/PC286 board provides two different ways to use your hard disk resources under MS/DOS emulation. They are detailed fully in ***Chapter 3. Configuration Options***. We recommend you read this discussion and decide, before installation, how you wish to build your Amiga/AT system.

3. CONFIGURATION OPTIONS

MS/DOS and Amiga systems have different configuration requirements. Generally, combining hardware on a PC requires setting battery maintained memory tables through the use of diagnostic or system setup software, provided by the manufacturer, and adding software drivers to the PC's startup routine, CONFIG.SYS.

Amiga users are spared much of this confusion because of the Amiga's auto-configuring architecture. The following information is not intended to be a DOS system configuration reference. Refer to your MS/DOS or application manuals for more complete information on what DOS expects.

Extended vs. Expanded Memory

Before the advent of the Intel 80286, all DOS applications and the DOS operating system were limited to a maximum of 640 kilobytes of memory. This 640k represented the entire RAM space available to DOS applications. Under DOS, program code and data had to be small enough to be contained in this space; along with the DOS, itself. More memory — so called ***Extended Memory*** — could be added to systems equipped with a '286 or higher, but, as it lay beyond the addressing capabilities of DOS, it was good for little more than disk caches and RAM disks.

As program functionality and data structure requirements tested the limits of the base 640k machines, three major DOS companies, Lotus, Intel and Microsoft (LIM), developed a technology standard for increasing memory resources beyond a single Megabyte. The LIM standard for ***Expanded Memory*** greatly extends the functionality of a DOS machine by making this RAM useful to correctly written applications. Data can be stored there and operated upon by these applications. Programs can also be loaded into it and executed.

But, whereas the Amiga automatically finds and uses any memory that's installed, a DOS system requires the use of a software driver, an Expanded Memory Manager *(e.g.: EMM.SYS)*, to make use of Expanded Memory. The DOS format utilities disk included with GVP/PC286 includes such an Expanded Memory Manager.

Note: Users are again instructed to read the README.TXT file on the GVP_PC286 distribution disk. This file contains a list of all the DOS programs included with the DOS Utilities disk.

By the release of DOS 5.0 *(and Digital Research's DR-DOS 5.0)*, the capability had been added to directly convert Extended Memory into something called High Memory *(through the use of the utility program **HIMEM.SYS**)* on systems equipped with a '286 or higher CPU. ***High Memory*** provides a way for DOS, and certain other correctly written software, to effectively use Extended RAM.

Similarly, Windows 3.0, by Microsoft, in its *Standard Mode*, includes the ability to use Extended memory for real work. It achieves this by running the 80286 chip in its ***Protected Mode***. Protected Mode allows the processor to function as a 32-bit machine capable of addressing up to 16 Megabytes.

When using the GVP/PC286 ***Configure*** program, you will be able to specify how much of your Amiga's memory will be recognized as Extended and how much as Expanded RAM. Those planning to use Windows 3.0 will probably want to assign all their RAM as Extended memory. Those who specify Expanded memory will have to make sure they run EMM.SYS, or some other Expanded Memory Manager, in order for this RAM to become available to LIM compatible programs *(e.g.: Lotus 1,2,3 version 2.2)* under MS/DOS.

Hard Drives and Partitions

Hard drives are physical data storage devices with a fixed capacity. Partitions are logical devices — also called volumes — that are created on a hard drive. A hard drive can contain one, or several, partitions.

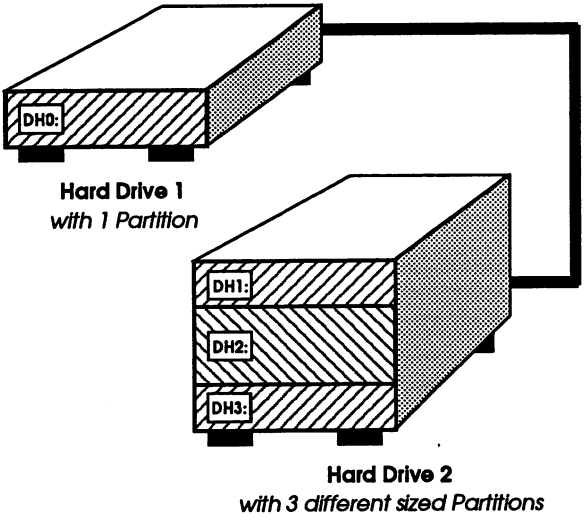


Figure 3.1 – Hard drives and Partitions.

On a MS/DOS machine, the first hard drive partition is always drive C:. Versions of DOS earlier than 3.3 provided support for C: and D: partitions only. Later versions allow for many more partitions.

DOS Partitions and AmigaDOS

Normally, a hard drive that the Amiga can read cannot be read by DOS; and one that is formatted under MS/DOS will be unreadable by AmigaDOS. GVP supports the creation of MS/DOS partitions in the following ways *(illustrated in Figure 3.2):*

A. Separate AmigaDOS and MS/DOS partitions on different physical drives.

B. Separate AmigaDOS and MS/DOS partitions on the same physical drive.

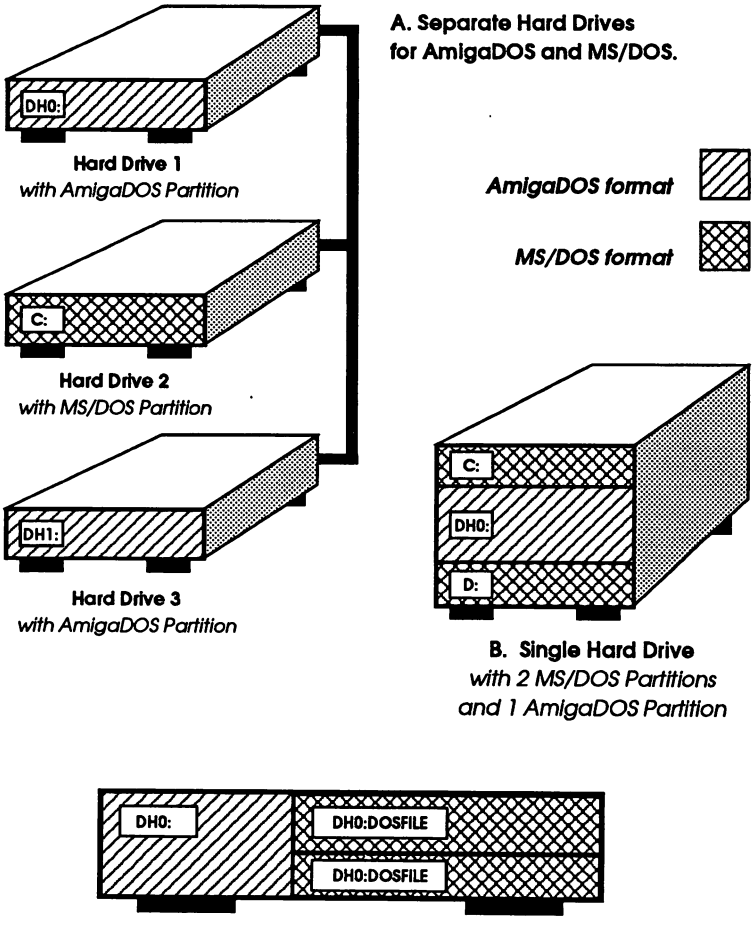


Figure 3.2 – Hard Drive Configurations supported by GVP/PC286.

C. Creation of a MS/DOS partition as a fixed-size ***file*** on an AmigaDOS partition.

Since hard drive configuration for the GVP/PC286 requires the more or less permanent allocation of hardware resources, it is a good idea to consider these several methods before proceeding.

In many ways, method A *(employing separate hard drives for AmigaDOS and MS/DOS partitions)* is the most satisfying. Maintaining separate disk drives effectively isolates each type of data into its own subsystem. Each MS/DOS drive must first be prepped and mounted by AmigaDOS. It can then be formatted under MS/DOS using FDISK.COM Not everyone has access to more than one hard drive, however.

Method B requires that a new partition be created on your AmigaDOS hard drive. This is accomplished using the ***FaaastPrep*** utility that came with your A500 HD. The Partition is specified and recorded in ***FaaastPrep*** just as any ordinary AmigaDOS partition, but it is not formatted under the AmigaDOS system. Instead, the PC286 emulator is started and the DOS utility FDISK.COM is used to format the partition under DOS.

Both methods A and B allow for hard drive performance up to the limits of the specific hardware and DOS software. Method C carries some additional overhead, but provides for a slight increase in data security. This method involves permanently allocating some large chunk of an AmigaDOS partition as a MS/DOS file.

The PC286 emulator will treat this single file as a physical hard drive partition and write data into it. The data format used within the file will be one that DOS understands, but the file, itself, will look like any other AmigaDOS file to the A500 filing system. One benefit to this method is that standard Amiga backup utilities (e.g.: *Quarterback* from Central Coast Software or GVP's own *TapeStore*) are able to archive your MS/DOS partitions.

Explicit descriptions of how to build each of these hard disk systems is provided in the Getting Started section; ***Chapter 7***. It would be wise, however, to decide at this time, which method you intend to use.

4. CUSTOMER SUPPORT

Customer Service for the GVP/PC286 board is provided by Great Valley Products, Inc. Our service lines are open 9:15 a.m. to 6:00 p.m. Eastern Time in the United States at (215) 337-8770. Additionally, GVP maintains a 24-hour ***Bulletin Board Service*** at (215) 337-5815 and a ***FAX*** line at (215) 337-9922.

In order to be eligible for telephone support, purchasers of the GVP/PC286 board must complete and mail in the Product Registration card that accompanies this manual. Doing so will ensure that you receive all forthcoming product information and updates. The mailing address for GVP is:

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

5. HARDWARE INSTALLATION

Package Contents:

- GVP/PC286 board in antistatic envelope
- One AmigaDOS format 3.5" disk containing PC286 emulation software and installation utilities
- One MS/DOS format 3.5" disk containing GVP/PC286 DOS utilities
- This manual and User Registration card

What You Need:

The following required items are not provided in this package and must be supplied by the user.

- Amiga 500 computer system
- GVP Series II A500 HD expansion
  or
- A530 Combo expansion
- Anti-static wrist strap *(available from Radio Shack)*
- MS/DOS 3.2 or later
- DOS application software

Optional Items:

- 80C287-12 math coprocessor

The only tool required to install a GVP/PC286 board is a medium-sized crosspoint screwdriver.

WARNING: The GVP/PC286 board achieves its small size and high performance through the use of CMOS VLSI chip technology. These chips are extremely sensitive to damage from static electricity. Observe completely the following cautions and instructions during installation. GVP assumes no responsibility for damage to PC286 board components resulting from improper handling.

The following instructions refer specifically to an A500 HD expansion product. The installation process is identical for an A530 Combo expansion and users of that product should follow the same steps exactly.

WARNING: Before proceeding, make sure that all power to the Amiga and A500 HD is shut off. Remove any peripheral and power cables.

1. If your A500 HD is already attached to the Amiga's expansion bus, spearate them and move the A500 HD to a clear workspace.

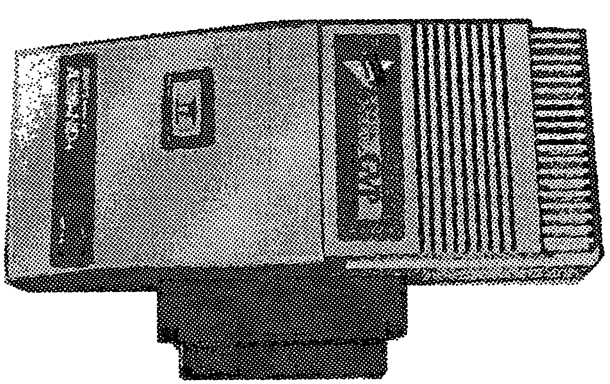


Figure 5.1 – The A500 HD Expansion Unit.

2. Turn the A500 HD unit upside down. Refer to Figure 5.2 and, using the crosspoint screwdriver, remove three screws as indicated.

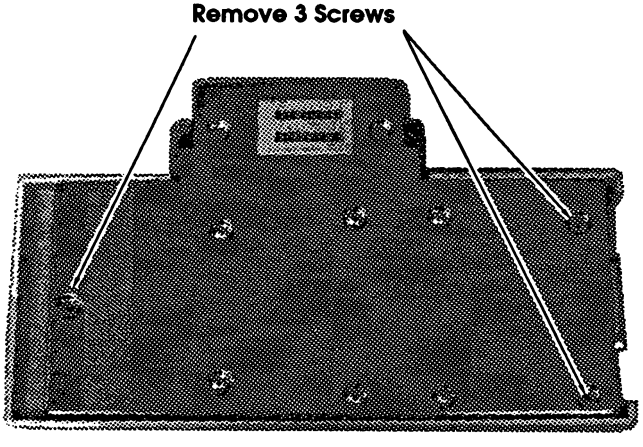


Figure 5.2 – Underside of A500 HD.

3. With the screws removed, turn the A500 HD right-side-up and carefully lift the plastic cover.

CAUTION: The A500 HD cooling fan and Game Switch are mounted on the plastic cover and wired to the A500 HD circuit board. Use care when lifting off the cover not to break these wires.

4. Note the connection points for the cooling fan and Game Switch wires. They are attached with press-fit connectors to terminal posts on the main circuit board.

5. Pull to free the connecting wires and then set aside the top cover. **Note the polarity of each connection as well as its position.**

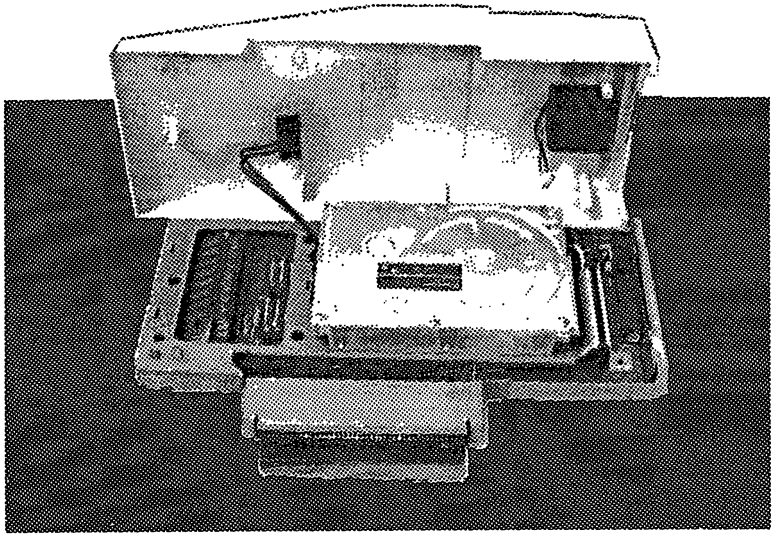


Figure 5.3 – A500 HD with cover removed.

6. Note the position, near the A500 HD bus connector, of the GVP Mini-Expansion slot *(see Figure 5.4)*. This is where you will be installing the GVP/PC286 board.

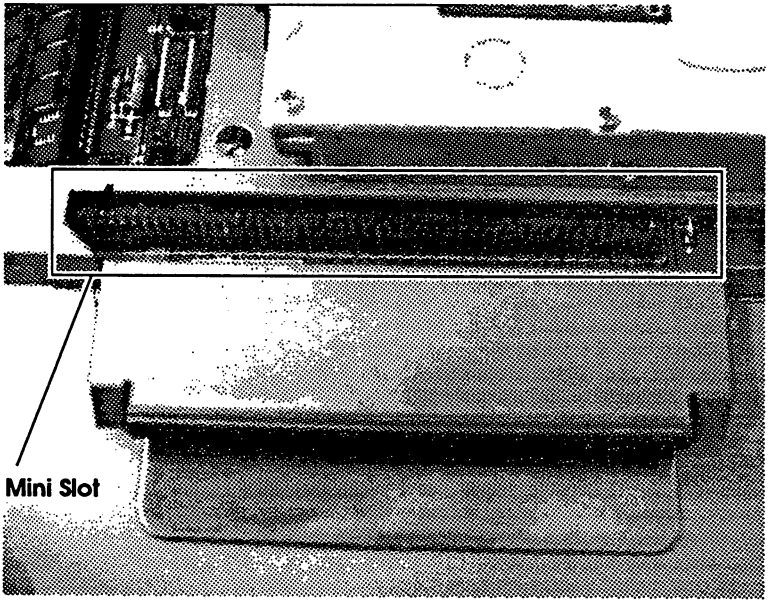


Figure 5.4 – Mini Expansion Slot.

WARNING: Be sure to use an anti-static wrist strap and to properly ground yourself while performing the remaining steps. Failure to do so may result in irreparable damage to the GVP/PC286 board.

7. After grounding youself, break the seal on the anti-static envelope that contains the GVP/PC286 board. Carefully remove the board and lay it flat on the envelope.

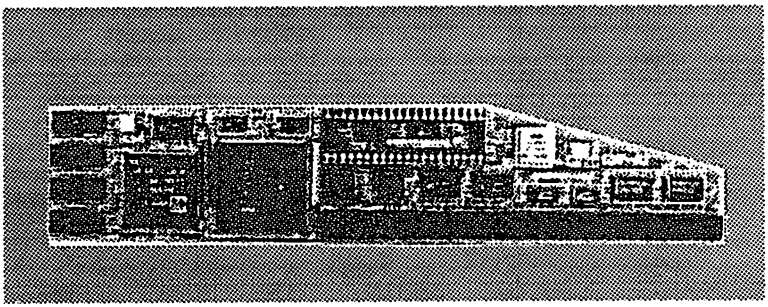


Figure 5.5 – The GVP/PC286 board.

The following steps describe how to add a math coprocessor to the GVP/PC286 prior to installing the board. Software that has been designed to work with one will show tremendous performance improvements in the presence of a math chip. Excel, 1-2-3, dBase, AutoCAD, and Framework are examples of programs that look for a math coprocessor. If you do not intend to use a math coprocessor, skip to step 9.

Note: Pay strict attention to the designator when purchasing a math coprocessor chip. The only supported chip is a 80C287-12. The C in the designator indicates a CMOS chip. Non-CMOS chips require much more power and will not work with the GVP/PC286 board. The trailing 12 indicates the coprocessor's rated clock speed.

8. *(Optional)* If you have a 80C287 math coprocessor, install it at this time.

WARNING: The 80C287-12 math coprocessor is a CMOS device and highly susceptible to damage from static electricity. Do not handle or attempt to install this chip without first grounding yourself.

8a. Refer to Figure 5.6 for the 80C287 chip location.

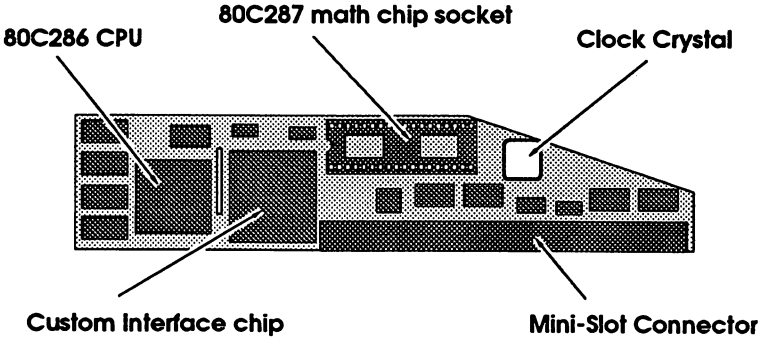


Figure 5.6 – Component Locations on GVP/PC286 board.

8b. If the 80C287 chip is brand new, you may have to bend the pins prior to installation. If the pins are not perfectly vertical, rest one whole row of pins against the table surface and gently bend the chip case to vertical *(see Figure 5.7)*. Repeat the procedure for the other row of pins.

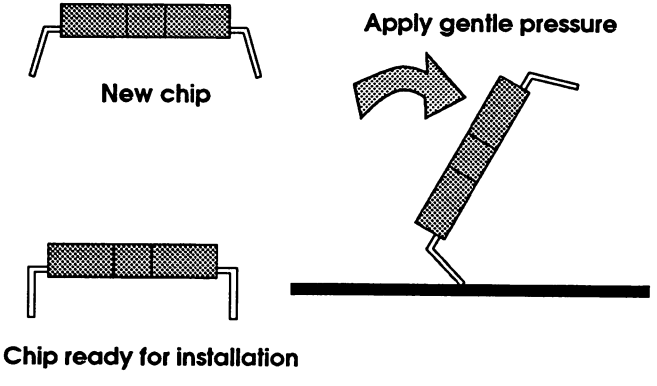


Figure 5.7– Straightening pins.

8c. Locate the 80C287 coprocessor pins into the socket holes. Make sure the chip is correctly oriented. The key notch on the chip should match that of Figure 5.8.

8d. Taking care that no pins are bent or misaligned, press the chip firmly into the socket. It should seat securely.

8e. Inspect the chip and socket arrangement for broken or bent pins.

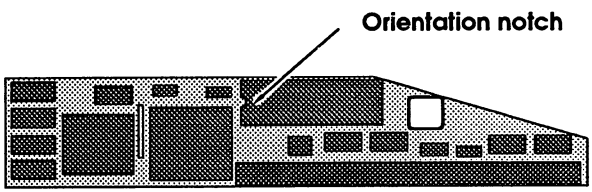


Figure 5.8– 80C287 Chip Installed

Now the GVP/PC286 board is ready to install into your A500 HD.

9. If there is an adhesive anti-static mat applied to the non-component side of the GVP/PC286 board, peel this off.

10. Match the socket on the lower edge of the GVP/PC286 board with the pins of the A500 HD Mini Expansion slot. There is only one way that this can be done.

Figure 5.9 – Locating the GVP/PC286 board onto Mini Expansion slot.

11. Taking care to correctly align all the pins, push the GVP/PC286 board straight down until firmly seated.

The A500 HD and PC286 board assembly should now look like that pictured in Figure 5.10.

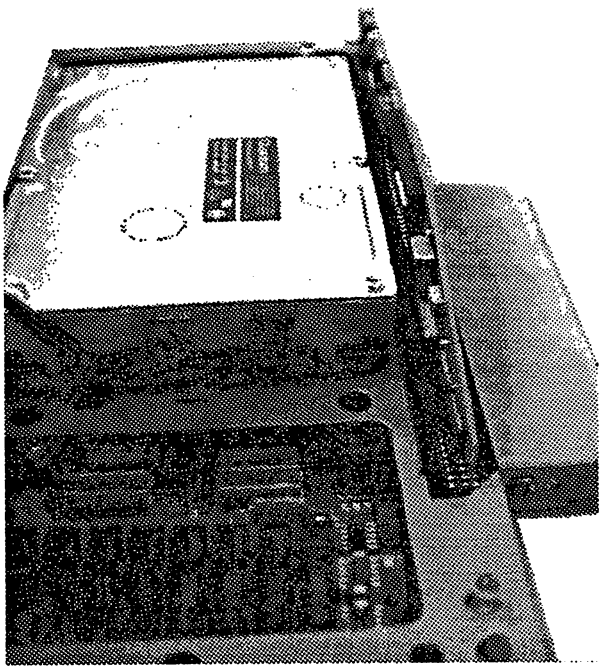


Figure 5.10 – Correctly installed GVP/PC286 board.

12. Reconnect the A500 HD cooling fan and Game Switch leads and replace the cover. Be sure to check the polarity of these connections. If the fan fails to operate or the Game Switch works in reverse, the polarity of the connectors is wrong.

13. Secure the cover onto the A500 HD using the screws removed earlier.

14. Align the A500 HD edge connector with the expansion bus of the Amiga 500.

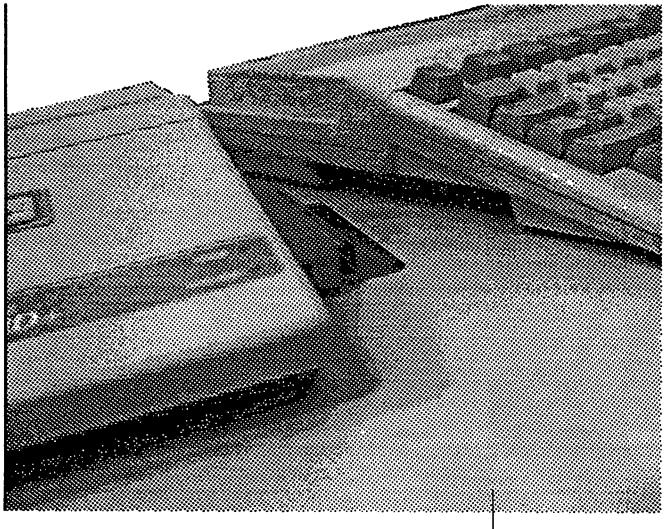


Figure 5.11 – Align A500HD bus connector with Amiga expansion port.

15. Taking care to properly mate the connectors, slide the A500 HD expansion module into the Amiga's chassis expansion bus. There should be a snug, positive fit.

16. Reconnect any removed power and peripheral cables. Apply power and boot the Amiga using your normal system disk. If you experience any unusual symptoms, switch off the power immediately and recheck all your work.

Figure 5.12 – Correctly installed A500 HD subsystem.

Installation Test

1. Insert a copy of the GVP/PC286 distribution disk into DF0: and power up the machine.

2. You will be presented with a series of messages and then a Workbench screen will open.

3. Open the GVP_PC286 drawer and double-click the PC286 icon. There will be a brief pause and then the machine will reset itself. This is expected.

4. The Amiga will then ask you to insert an MS/DOS System disk into DF0:

5. When you see the request for MS/DOS, you have just demonstrated that the GVP/PC286 board works. You may now proceed to load a DOS disk as prompted, or to reset your computer and proceed with the next chapter, Software Installation.

Note: When you reset AmigaDOS (Ctrl + Left Amiga + Right Amiga), the PC286 (if active) will remain active during the reboot. It will be reset along with AmigaDOS, but you do not have to reload the PC286 program.

Under PC286 emulation, MS/DOS can be reset using the standard Ctrl + Alt + Del key combination. PC286 emulation can be removed from the sytem by pressing Left Amiga + Right Amiga + Q. Neither of these reset operations will affect a simultaneously running AmigaDOS session.

Hardware Troubleshooting

If the machine fails to boot, investigate the following possible causes:

- Either the Amiga 500 or A500 HD is not connected to its power supply.
- The monitor is not connected or turned on.
- The A500 HD is not correctly seated into the Amiga's expansion bay.
- The installation was not successful. Examine the Mini Expansion slot and the GVP/PC286 board for broken or bent pins or other signs of damage.

6. SOFTWARE INSTALLATION

This section describes installing the GVP/PC286 emulation software onto a GVP hard disk. It is assumed that a SCSI hard disk is available to this system. Most purchasers will already have a functioning hard disk as part of the A500 HD expansion. It should also be noted that the GVP/PC286 board can be operated on a floppy-only machine, and there may be some who use the A500 HD as a RAM expansion only.

Experienced Amiga users may freely explore the GVP/PC286 in their own ways; this discussion will lead the newcomer in the most direct path to Lotus 1,2,3.

1. If you haven't already done so, install the GVP/PC286 board into your A500 HD or A530 according to the procedures in Chapter 5. Be sure to follow the instructions exactly.

2. If you haven't already done so, insert the GVP/PC286 distribution disk into DF0: and power up your machine.

3. After Workbench loads, open the icon representing the GVP_PC286 disk and then open the GVP_PC286 drawer. Inside, you will see an icon for the ***PC286*** emulation program, an icon labeled ***HD_Install***, and one called ***Configure***.

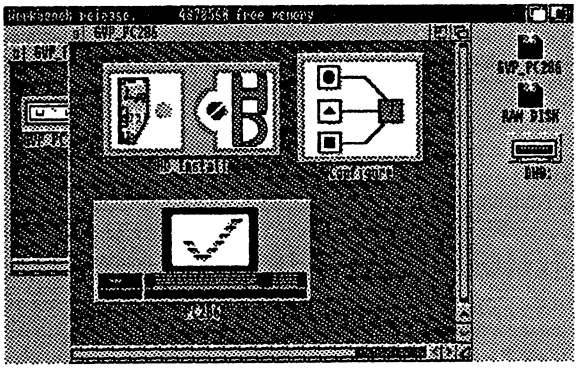


Figure 6.1 – GVP/PC286 disk contents.

4. To move the GVP/PC286 emulator software onto your hard disk, double click on the ***HD_Install*** Icon.

The following message will be displayed on your screen.

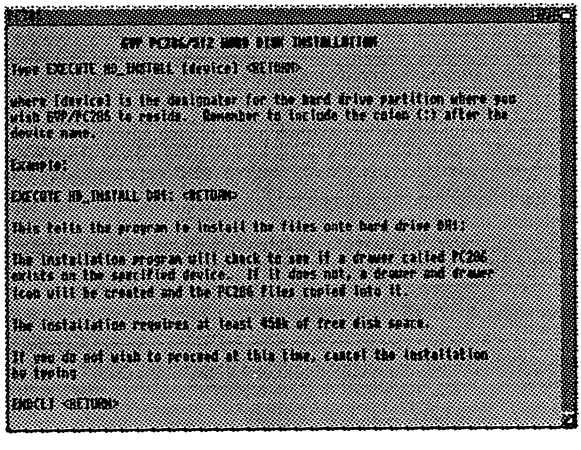


Figure 6.2 – HD_Install script.

Type EXECUTE HD_INSTALL (device) <RETURN>

where (device) is the designator for the hard drive partition where you wish GVP/PC286 to reside. Remember to include the colon (:) after the device name.

Example:

EXECUTE HD_INSTALL DH1: <RETURN>

This tells the program to install the files onto hard drive DH1:

The installation program will check to see if a drawer called PC286 exists on the specified device. If it does not, a drawer and drawer icon will be created and the PC286 files copied into it.

The installation requires at least 450k of free disk space.

If you do not wish to proceed at this time, cancel the installation by typing

ENDCLI <RETURN>

PC286 purchasers who prefer to use the CLI should note that the complete contents of the ***GVP_PC286*** drawer are copied from the distribution disk to the destination drive. In addition, the file ***rct.library*** must be copied from the ***libs:*** directory of the distribution disk to your System ***libs:*** directory.

5. To prepare the GVP/PC286 emulator for operation, double click on the ***Configure*** icon.

Note: The Configure program will create a default configuration file. If you have copied your GVP/PC286 software to hard disk, run the Configure program from the GVP_PC286 directory on your hard disk. Running Configure from the floppy will save the configuration file on the floppy disk only.

6. ***Configure*** opens its own screen with a number of entries in the menu bar.

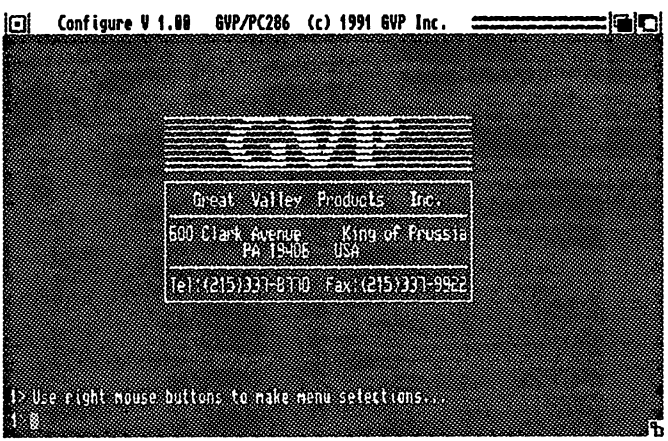


Figure 6.3 – GVP/PC286 Configuration screen.

7. Hold down the right mouse button and examine the menu headings:

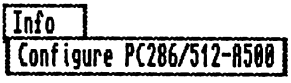
- Info – Displays the current version of ***Configure***
- Project – Quits the ***Configure*** program
- Options – Configures the GVP/PC286 emulator to your system

- Country – Sets all screen display elements to use English or German languages for text *(future versions will support additional languages)*

- Operation – Allows configuration of the A500 to maximize resources for PC286 emulation and even to disable AmigaDOS altogether

A complete descriptions of these menu entries follows:

Info



The Info menu selection exists solely to determine the current version of the ***Configure*** program. As new versions of the software are released, they may be shipped with a newer ***Configure*** program. With this distribution, the current version is the only version.

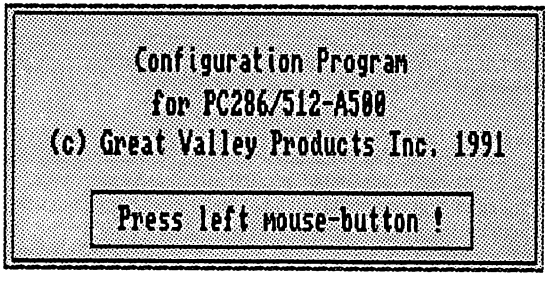


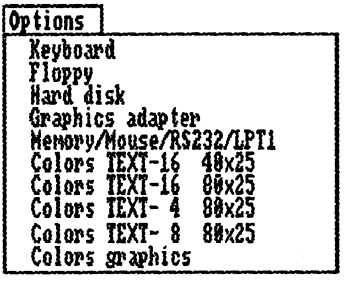
Figure 6.4 – Configure Info display.

Project

Project

Choose ***Quit*** to exit the configure program. If you modified any of the Options settings, a requester will appear asking if you wish to save your new defaults to the configuration file.

Options



The options menu provides the means by which you can customize the PC286 emulation to your liking. Settings made here can always be modified at some future date by simply running the ***Configure*** program again. In addition, graphic emulation modes can be changed while running under MS/DOS by executing the various programs supplied with the DOS Utilities disk. The Options settings include:

Keyboard

The Keyboard option presents a requester which controls how the Amiga's keyboard is interpreted under MS/DOS.

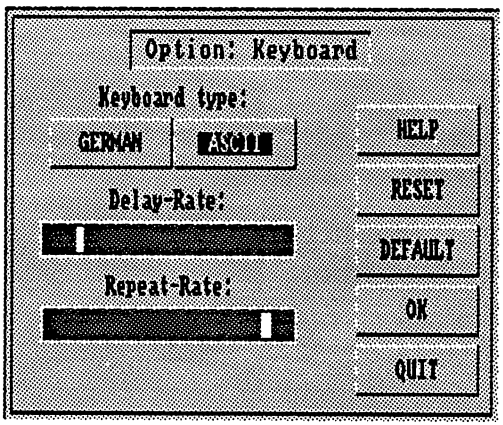


Figure 6.5 – Keyboard Options.

Keyboard Type

Choose between ASCII or European *(German)* keyboard mapping. Users interested in preserving their Amiga keyboard map under MS/DOS should choose the ASCII Keyboard Type. Those familiar with DOS computers should note that the GVP/PC286 board does not require the MS/DOS file *KEYBOARD.SYS*.

Repeat Rate

Adjusts the speed at which a key repeats when held down. The menu includes a slider gadget. This can be adjusted by grabbing it with the mouse and moving it left or right. Adjusting the slider to the left reduces the repeat rate of the keys. Adjusting the slider to the right increases the repeat rate of the keys.

Delay Rate

Adjusts the length of time a key must be held before it begins repeating. This option also includes a slider control. Adjusting the slider to the left decreases the repeat delay, making the keyboard less sensitive. Adjusting the slider to the right increases the delay, making the keyboard more sensitive.

Help

Clicking the **Help** button opens a text screen describing the various options available to this requester.

Reset

Clicking the **Reset** button undoes any modifications made since the last saved Default.

Default

Clicking the **Default** button resets all Options selections to the factory defaults. This choice overrides any previously saved user defaults.

OK

Clicking **OK** indicates your acceptance of the modified settings. The requester will be exited, but the defaults will not be saved to a configuration file until you exit the ***Configure*** program.

Quit

Clicking **Quit** aborts the present operation. The requester disappears without registering any changes to the options it controls. Choosing **Quit** from this requester does not quit the ***Configure*** program, however.

Floppy

Amigas can have up to four floppy drives attached – DF0: through DF3:. MS/DOS recognizes just two floppy drives – A: and B:. This menu option allows you to assign any two of your Amiga's floppy drives as DOS drives.

Note: Since the GVP/PC286 board multitasks with AmigaDOS, any drives identified as A: and B: will still be available to AmigaDOS when working in that environment.

Upon selection of the Floppy menu, a requester appears:

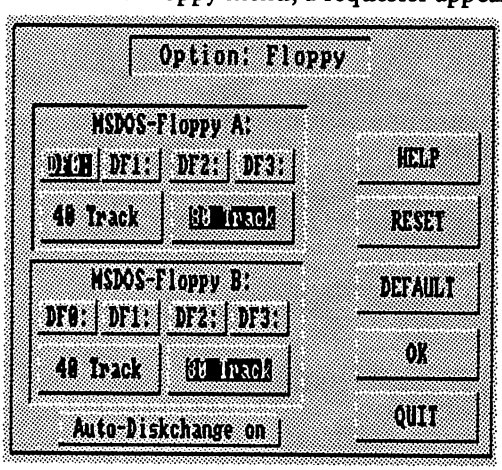


Figure 6.6 – Floppy Drive Interpretation requester.

The Floppy Option menu entry also allows you to specify 40 track *(360k)* or 80 track *(720k)* densities for floppy disk operation. While the GVP/PC286 board is fully capable of recognizing and addressing high-density *(1.2 Megabyte 5.25" or 1.44 Megabyte 3.5")* drives, these devices are currently not available on the Amiga.

Auto Diskchange

The Amiga's multitasking nature requires it to closely monitor every time a floppy disk is inserted or ejected. This prevents one program from corrupting data that might be in use by another simultaneously running program.

Users of DOS machines, on the other hand, are quite accustomed to removing and inserting floppy disks at will. If the **Auto Diskchange** button is set to **ON**, the Amiga will continue to monitor floppy drive activity and check or validate any disk, whether MS/DOS or AmigaDOS, as soon as it is inserted. The drive light will come on for several seconds and no activity will be permitted until the disk has been validated.

This can introduce annoying interruptions into a DOS work session. Selecting **Auto Diskchange OFF** disables the AmigaDOS disk checking while working in MS/DOS. In any case, disks will always be inspected and validated as soon as you switch back to AmigaDOS operation.

Help

Clicking the **Help** button opens a text screen describing the various options available to this requester.

Reset

Clicking the **Reset** button undoes any modifications made since the last saved Default.

Default

Clicking the **Default** button resets all Options selections to the factory defaults. This choice overrides any previously saved user defaults.

OK

Clicking **OK** indicates your acceptance of the modified settings. The requester will be exited, but the defaults will not be saved to a configuration file until you exit the ***Configure*** program.

Quit

Clicking **Quit** aborts the present operation. The requester disappears without registering any changes to the options it controls. Choosing **Quit** from this requester does not quit the ***Configure*** program, however.

Hard Disk

The GVP/PC286 board provides three methods for using hard disk resources. These are described in ***Chapter 3. Configuration Options.*** The choices involve either dedicating a hard drive partition to be formatted under MS/DOS or the creation of a large (multi-Megabyte) AmigaDOS file on an existing AmigaDOS partition for use under DOS emulation. Specific case studies of these methods will be provided in ***Chapter 7. Getting Started.***

Whichever method is chosen, the device assignments are made using the Options/Hard Disk menu selection. It is important to note that both methods of hard drive storage can be used simultaneously on a single GVP/PC286 Amiga system. Upon selection, a requester appears:

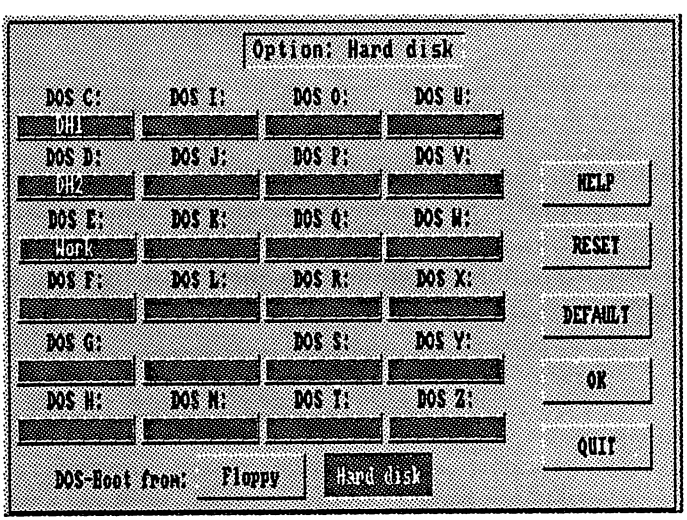


Figure 6.7 – Hard Drive selection requester.

When assigning DOS partitions to an Amiga hard drive partition *(methods A and B as described in Chapter 3)*, simply supply the appropriate ***drive identifier*** under the DOS partition name *(refer to Figure 6.6; DOS C, DOS D, or DOS E).*

If you choose to employ the DOSfile method *(method C as described in Chapter 3)*, a little more calculation is required. Initially, you will type the drive identifier and your choice of ***filename*** in the appropriate slot.

In order for the Amiga to know how much dataspace to reserve, we must specify a size, expressed in terms of logical starting and ending cylinders on an imaginary DOS hard drive. The Amiga may put the file anywhere it chooses, but the cylinder values will persuade DOS that it is talking to a known device.

Drive Cylinders

Hard Drives record data in concentric rings on round platters; sort of like a phonograph record or audio CD. Each ring is called a cylinder.

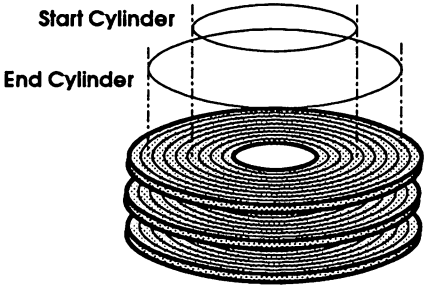


Figure 6.8 – Hard drive cylinder arrangement.

For its purposes, the PC286 assumes a cylinder to contain approximately 108kb. That's the product of 8 heads x 27 blocks per track x 512 bytes per block; a more or less typical arrangement for hard drives on a DOS machine.

To create a DOSfile of a given size, divide 108,000 into the total desired MS/DOS partition size. For instance, a 20 Megabyte partition, divided by 108kb per cylinder, yields 180 cylinders *(we are willing, in this case, to round figures down in order to simplify our calculations).*

Using this technique, a 60 Megabyte DOSfile on the Amiga can be made to contain three 20 Megabyte MS/DOS partitions. They would be specified as follows:

DH0:MYDOSFILE,0,180

DH0:MYDOSFILE,181,361

DH0:MYDOSFILE,362,543

How many partitions?

DOS versions 3.3 and later can directly employ up to 24 hard drive partitions. Once mounted under AmigaDOS[1], they may be configured using the ***FDISK.COM*** DOS utility. Versions of

1. GVP's A500 HD and A530 SCSI controllers use Auto-mount technology. In most cases, as soon as you power up your system, all hard drives, whether AmigaDOS or MS/DOS formatted, will be mounted by the SCSI controller and ready to use.

be configured using the ***FDISK.COM*** DOS utility. Versions of MS/DOS earlier than 3.3 provided support for a maximum of two hard drive partitions – C: and D:. If you are using such a version of DOS, and would still like to use additional partitions, the GVP/PC286 can assign them using this requester.

In addition to selecting hard disk partition assignments, this menu option allows you to specify whether to boot into MS/DOS from the C: hard drive partition or from floppy. If you select Floppy, The GVP/PC286 emulator will ***always*** prompt you for a MS/DOS system floppy regardless of the number or configuration of hard drives attached.

Help

Clicking the **Help** button opens a text screen describing the various options available to this requester.

Reset

Clicking the **Reset** button undoes any modifications made since the last saved Default.

Default

Clicking the **Default** button resets all Options selections to the factory defaults. This choice overrides any previously saved user defaults.

OK

Clicking **OK** indicates your acceptance of the modified settings. The requester will be exited, but the defaults will not be saved to a configuration file until you exit the ***Configure*** program.

Quit

Clicking **Quit** aborts the present operation. The requester disappears without registering any changes to the options it controls. Choosing **Quit** from this requester does not quit the ***Configure*** program, however.

Graphics Adapter

The GVP/PC286 provides a number of different graphics emulations. These are selected through the Options/Graphics Adapter menu item. Making this selection calls up the following requester:

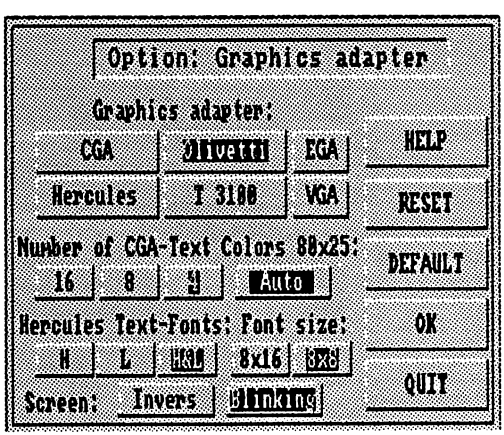


Figure 6.9 – Graphics Adapter requester.

Graphics Adapter

The GVP/PC286 supports the following PC graphic display emulations:

- CGA text and graphics
- Olivetti text and graphics
- Hercules text and graphics
- Toshiba T3100 text and graphics
- EGA-monochrome graphics
- VGA-monochrome graphics

Click the button for the display adapter you wish to emulate.

Number of CGA text colors

Each mode has a different number of colors available; 16, 8, 4, or monochrome. In monochrome, two colors *(black and white, usually)* are used and the screen is dithered to approximate shades of gray.

It is important to note that your system's performance will be greatly affected by the number of colors you choose. Since the PC286 must share its memory and display resources with an otherwise fully functioning Amiga 500, both sysbystems will be significantly slowed. The more colors you ask for, the more resources the PC286 must borrow from the Amiga.

Click the button that corresponds with the number of colors you wish to use. Clicking ***Auto*** will automatically choose the maximum number of colors the chosen emulation will support.

Graphics emulation modes can also be changed while running under MS/DOS. The following utilities are provided on the DOS Utilities disk for this purpose:

- CGA.EXE
- V400.EXE
- MDA.EXE
- EGA.EXE
- VGA.EXE

Note: The following table describes the graphic displays that produce optimum performance:

Display Emulation	Colors	DOS command
CGA 80x25	4	CGA 4 <ENTER>
OLIVETTI 80X25	4	V400 4 <ENTER>
HERCULES 80X25	2	MDA 8 <ENTER>
VGA/EGA 80X25	2	VGA 4 <ENTER> EGA 4 <ENTER>

Table 6.1 – Optimum display modes.

Hercules Text Font

In Hercules Text mode, two different fonts can be selected. *H* stands for High intensity and *L* stands for Low Intensity. The *H&L* selection provides both. Users should be cautioned that selecting both High and Low intensity text will appreciably degrade video performance, since it introduces an additional level of character-by-character software interpretation.

Font Size

Two font sizes are supported. **8x16** and **8x8**. Choose a text font size that matches the display resolution selected above *(40 columns vs. 80 columns)*. Click on the button that corresponds with the chosen size.

Screen

Choosing **Inverse** will provide inverted text rendering modes *(white text on a black field becomes black text on a white field)*. Choosing **Blinking** enables blinking text rendering mode *(characters flash on and off)*.

As with **High** and **Low intensity** modes, choosing either Inverse or Blinking characters will add interpretation overhead to the display, slowing performance. Choosing both will compound the performance degradation.

Help

Clicking the **Help** button opens a text screen describing the various options available to this requester.

Reset

Clicking the **Reset** button undoes any modifications made since the last saved Default.

Default

Clicking the **Default** button resets all Options selections to the factory defaults. This choice overrides any previously saved user defaults.

OK

Clicking **OK** indicates your acceptance of the modified settings. The requester will be exited, but the defaults will not be saved to a configuration file until you exit the ***Configure*** program.

Quit

Clicking **Quit** aborts the present operation. The requester disappears without registering any changes to the options it controls. Choosing **Quit** from this requester does not quit the ***Configure*** program, however.

Memory/Mouse/RS232/LPT1

Selecting Options/Memory/Mouse/RS232/LPT1 produces a requester that allows for the configuration of both memory resources and Input/Output ports.

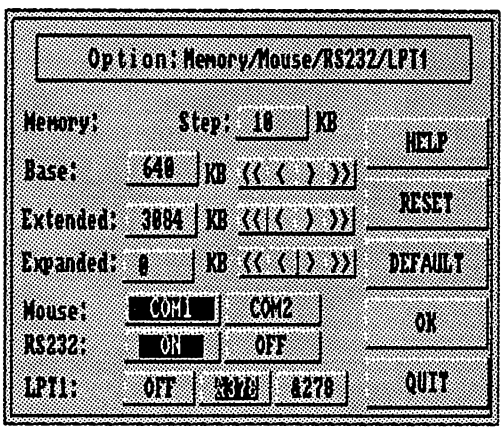


Figure 6.10 – Memory and I/O requester.

Memory

Chapter 3 discussed the different memory models available under MS/DOS; base, extended and expanded. This requester provides the means for determining how much of your Amiga's system RAM will be allocated to each.

Use the set of **increment** and **decrement arrows** to add or remove memory from each memory type display.

Use the **"chunky" increment** and **decrement arrows,** in coordination with the Step button to add or remove memory by the *tens*, *hundreds* or *thousands* of kilobytes.

Mouse and Serial

The Amiga has only one serial port and a separate port for mouse input. On a PC, there are usually two assignable serial devices, **COM1** and **COM2**. The Amiga's mouse is recognized by the GVP/PC286 as a Microsoft Serial mouse. It can be assigned to either COM1 or COM2.

Whichever serial port is *not* assigned to the mouse will be mapped onto the Amiga's serial port. It is also possible to switch off the RS232 *(serial)* port under MS/DOS *(if, for instance, the Amiga is already using its serial port to run a BBS or laser printer).*

Users should be aware that PC286 will take over the serial port if RS232 is selected in this requester. Access from the Amiga will be blocked.

Parallel

The Amiga's parallel port can be assigned as **LPT1** to either DOS port address $278 or $378. It can also be disabled.**Users should be aware that PC286 will take over the parallel port if LPT1 is assigned in this requester. Access from the Amiga will be blocked.**

Help

Clicking the **Help** button opens a text screen describing the various options available to this requester.

Reset

Clicking the **Reset** button undoes any modifications made since the last saved Default.

Default

Clicking the **Default** button resets all Options selections to the factory defaults. This choice overrides any previously saved user defaults.

OK

Clicking **OK** indicates your acceptance of the modified settings. The requester will be exited, but the defaults will not be saved to a configuration file until you exit the ***Configure*** program.

Quit

Clicking **Quit** aborts the present operation. The requester disappears without registering any changes to the options it controls. Choosing **Quit** from this requester does not quit the ***Configure*** program, however.

Display Colors

Each display emulation has a 2, 4, 8 or 16 color palette associated with it. These palettes can be adjusted and saved so that any change in display mode will also load the default palette for that mode.

Select each configuration separately from the Options menu:

Colors TEXT-16 40x25

CGA, Olivetti and T3100 display emulations can display on a 40 column by 25 line character-based screen using 16 colors. This mode, if chosen, can be expected to produce moderate performance degradation The colors for this resolution are adjusted by sliding the Red *(R)*, Green *(G)*, and Blue *(B)* sliders.

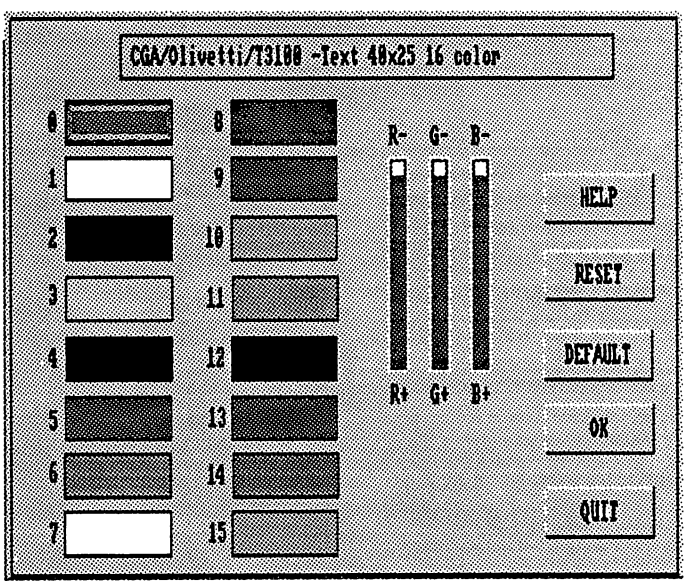


Figure 6.11 – CGA 40x25, 16 color palette adjustment.

Colors TEXT-16 80x25

CGA, Olivetti and T3100 display emulations can display on a 80 column by 25 line character-based screen using 16 colors. This mode, if chosen, can be expected to produce severe performance degradation. The colors for this resolution are adjusted by sliding the Red *(R)*, Green *(G)*, and Blue *(B)* sliders.

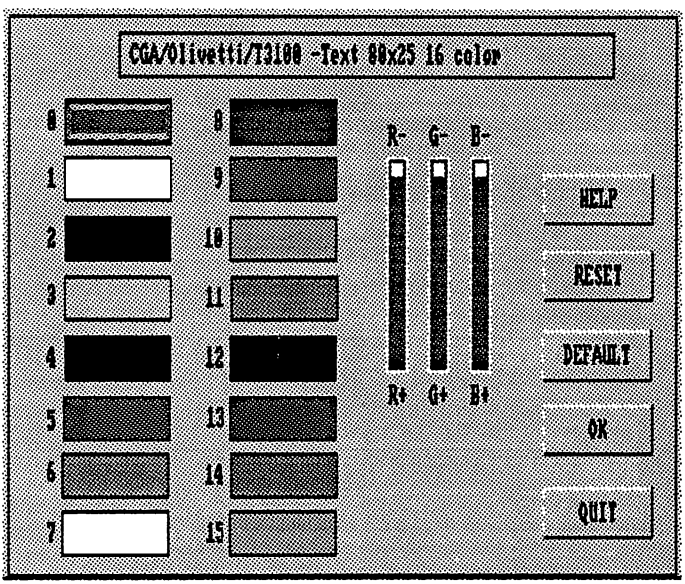


Figure 6.12 – CGA 80x25, 16 color palette adjustment.

Colors TEXT-8 80x25

CGA, Olivetti and T3100 display emulations can display on a 80 column by 25 line character-based screen using 8 colors. This mode, if chosen, can be expected to produce moderate performance degradation. The colors for this resolution are adjusted by sliding the Red *(R)*, Green *(G)*, and Blue *(B)* sliders.

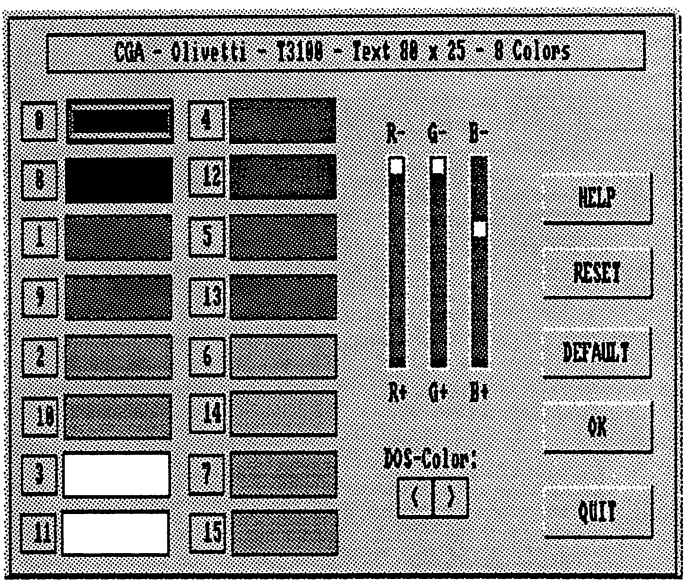


Figure 6.13 – CGA 80x25, 8 color palette adjustment.

Colors TEXT-4 80x25

CGA, Olivetti and T3100 display emulations can display on a 80 column by 25 line character-based screen using 4 colors. This mode permits the most efficient graphics display performance for non-monochrome emulations. The colors for this resolution are adjusted by sliding the Red *(R)*, Green *(G)*, and Blue *(B)* sliders.

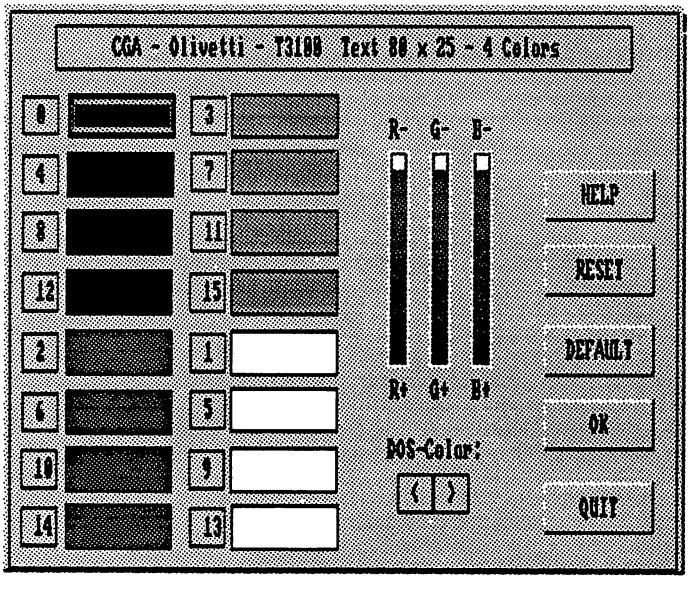


Figure 6.14 – CGA 80x25, 4 color palette adjustment.

Color graphics

This palette allows you to set the colors for CGA Low-resolution palettes 1 & 2 (3 colors). It also determines the foreground and background colors for Hercules-graphics, EGA-monochrome and VGA-monochrome emulations and the High-resolution (2 color) modes for CGA, Olivetti, and T3100.

Note: Both Olivetti and T3100 emulations support a 640x400 high-resolution graphics display using 2 colors.

Users of monochrome should beware of assigning the same colors to both foreground and background palette entries. This will result in an invisible display.

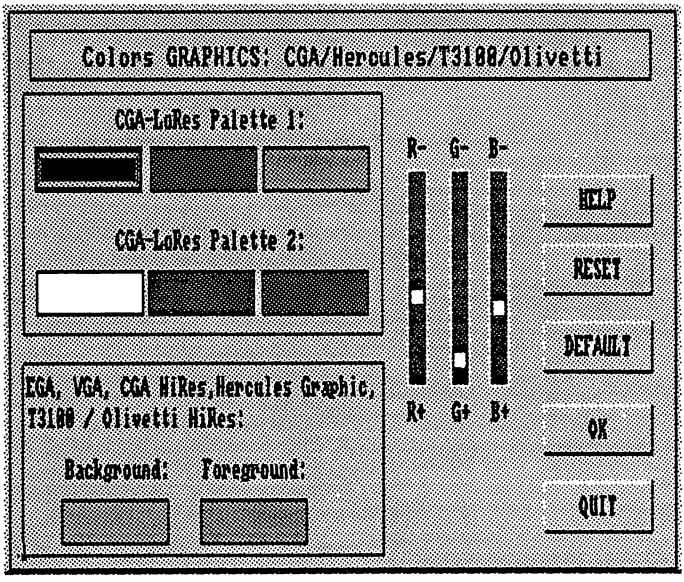


Figure 6.15 – Color graphics palette adjustment.

Country

Most of the GVP/PC286 program display elements draw on text-file resources that can be "localized," or rendered in different languages. The current version of PC286 supports both English and German language displays, help screens, etc. Future versions will extend this flexibility to include many other languages.

Operation

The Operation menu provides control over how much of your Amiga the GVP/PC286 "gets." These selections disable the AmigaDOS functions to varying degrees.

Stop Amiga Boot

Normally, PC286 boots into MS/DOS as soon as it is enabled. While this is happening, the Amiga also continues to boot into AmigaDOS *(usually in a screen hidden behind the DOS screen)*. When you select Stop Amiga Boot, the Amiga's normal *s:startup-sequence* script file is terminated. The Amiga will come up, but it will remain in an elementary stage. Workbench will not be loaded and memory will not be allocated for disk buffers and resident control structures.

The principal reason for using this menu option is to maximize the amount of memory and system resources available to the PC286 emulation.

PC 286 only

An even more extreme way to improve DOS performance is to select PC 286 only. This menu selection actually prevents the Amiga from booting at all. The GVP/PC286 gets all of the system's resources and does not have to contend with display or I/O operations happening in AmigaDOS at all.

Exiting Configure

When ready, select Project/Quit from the ***Configure*** menu bar or click the close box in the main window. If no changes have been made, the program will exit peacefully to the Workbench screen.

If even one configuration option has been modified, you will be presented with a requester asking if you want to save the new settings into your configuration file. Indicating ***Yes*** will cause the file to be written. If you choose not to save the file, click ***No*** and the program will exit cleanly.

7. Getting Started

Hard Drive Case Studies

Rickie has an Amiga 500 equipped with an A500 HD and has just installed the GVP/PC286 board into his system. He has an 80 Megabyte hard drive and four Megabytes of memory. Karen has a similar setup, but she has two external hard drives; one of them a Ricoh removable cartridge drive. Tom has recently upgraded his A500 with an 8 Megabyte A530 combo system and the PC286. He has one large, 450 Megabyte drive in addition to his 40 Megabyte internal drive.

Each of our case studies has different needs and different resources. By studying how they set up and run their systems, we should gain some appreciation of the flexibility of the GVP/PC286 system. We should also, it is hoped, understand enough to construct our own optimum A500/PC286 system.

Rickie

After performing the hardware installation test and determining that his system works, Rickie resets his machine and lets it boot into AmigaDOS. Taking the time to be careful, Rickie completely backs up the contents of his hard drive.

Rickie's hard drive is about one-third full. He doesn't have many DOS programs that he needs to run, but he has inherited a mailing list database containing about 20 Megabytes of model airplane hobbyists' addresses and telephone numbers.

Rickie concludes that he can devote 30 megabytes of his hard drive to a DOS partition. That leaves approximately 25 Megabytes for future growth.

Upon completion of his backup, Rickie restarts ***FaaastPrep*** and subdivides his single partition hard drive into one 50 Megabyte partition for AmigaDOS *(DH0:)* and one 30 Megabyte partition for MS/DOS *(DH1:)*. He proceeds to format the AmigaDOS side and then restore his data to the DH0: partition.

With his newly constituted system back in operation, Rickie opens the GVP_PC286 drawer on his AmigaDOS partition and starts the ***Configure*** program.

Since his mailing list application will work perfectly well in a 4-color screen, Rickie selects the CGA 80x25 Text mode in 4 colors. As for memory, Rickie decides to allocate two megabytes to Expanded Memory. He makes a note to himself to remember to install ***EMM.SYS*** on his DOS drive and to add it to his CONFIG.SYS file, as well.

Rickie calls up the Options/Hard Drive requester. Under DOS C, he enters DH1. Until the hard drive is formatted and has DOS installed, Rickie must leave PC286 configured to boot from floppy. Later, he will change this to make his machine hard disk bootable.

The rest of the default settings look pretty good to Rickie; mouse, LPT, etc. He selects Project/Quit and indicates for the settings to be saved into his ***Configuration*** file.

When he starts up the PC286 program, Rickie is prompted for a DOS system disk. He inserts a version of MS/DOS and proceeds to install it according to the instructions in his DOS manual.

The first thing he must do is to prepare the MS/DOS partition C:. He uses the DOS program ***FDISK.COM*** to prepare the partition and, upon returning to DOS, issues the following command:

```
FORMAT C: /S <ENTER>
```

The parameter */s* tells the DOS floppy to copy its system files to the new partition, making it bootable.

When complete, Rickie types:

```
COPY *.* C: <ENTER>
```

This copies all the files on the DOS floppy to the hard disk partition. He then performs the same operation to copy all the files from his GVP/PC286 DOS Utilities disk to the hard drive as well.

Finally, Rickie uses the DOS command EDLIN to edit his DOS startup script CONFIG.SYS. He adds the command for EMM.SYS that will enable his Expanded memory.

When finished, Rickie switches off his machine. After a minute or so, he powers up and returns to the ***Configure*** program. After modifying his configuration file to boot from hard drive, he is all set to try out the new 286 subsystem.

Rickie double clicks the ***PC286*** program icon. In a few seconds, his system resets and, when it comes back up, the PC emulator begins to boot directly off the C: partition.

Karen

Karen's roommate is an exchange student from Frankfurt, Germany. They are both studying medicine at college and must share the same computer for all their schoolwork. It is Karen's intention to prepare separate Ricoh cartridges for herself and her roommate.

Like Rickie, Karen backs up her entire system before installing the GVP/PC286. She uses ***FaaastPrep*** to prepare and mount each of her Ricoh cartridges *(RH0: and RH1:)*. Then, she prepares a 10 Megabyte partition on her other, fixed, hard drive. This will become the DOS machine's boot disk. The Ricoh cartridges will then become data storage devices for herself and her roommate. When that is done, she installs the board and software onto her AmigaDOS boot drive.

Following a similar procedure to that described above, Karen chooses graphics modes, memory configuration and I/O preferences. Under Hard Drives, Karen enters DH1 as the DOS boot drive C:. For herself, she assigns RH0 to DOS D: and, for her roommate, RH1 as DOS E:.

She must use ***FDISK.COM*** to prepare each partition and then format each one using the DOS command ***FORMAT***. When finished, she is able to copy all the DOS system files to DH1: and make it the bootable drive in her ***configuration*** file.

Once the system is operational, Karen's roommate creates her own ***configuration*** file that specifies a German keyboard and German language text prompts.

Tom

Tom is a maker of multimedia software. He needs DOS compatibility to move picture and sound files from one platform to the other. Since he deals with huge amounts of data, he chooses to use the DOSfile method for his partitions. This choice is motivated by the fact that backing up a 450 Megabyte hard drive can take a very long time. If he uses the DOSfile method, he can take advantage of GVP's ***Tapestore*** tape backup system to do periodic disk image backups ***(its most efficient mode)***.

After backing up his existing data, Tom uses ***Configure*** to create a 200 Megabyte DOSfile on his main drive. He also creates a much smaller DOSfile on his internal hard disk to act as a boot partition.

His entries in the Options/Hard Disk requester look like this:

DOS C
DH0:BootFile,0,75

DOS D
DH0:BootFile,76,2076

Note: Recall that only one DOSFile may be used, but that it may contain as many as 24 separate DOS partitions. The first cylinder must always be 0.

Because Tom is running an A530 accelerator, he can expect to experience much less of the system performance degradation that using DOSfiles forces on standard A500 systems. For this same reason, his is also able to run Windows 3.0 in 16 color mode with only modest slowdowns.

Go Pc286!

These examples are presented purely to illustrate the range of configuration possibilities available to users of GVP/PC286. Your own choices should be motivated by the kinds of work you need to do and the resources at your disposal.

When your system is configured to your liking, double click on the PC286 icon to launch the PC emulator.

Compatibility Notes

DOS 3.3 and Extended Partitions

Versions of MS.DOS older than 3.3 were able to mount and use only two hard disk partitions – C: and D:. PC286 allows you to use additional hard drive partitions through its ***Configure*** program.

Users of DOS 3.3 or later, however, may choose to use that operating system's support of ***Extended Partitions***, instead. In this case, only C: and D: need be assigned under ***Configure***. The other partitions, however many there may be, can be added using ***FDISK.COM*** under MS/DOS.

8. DOS Operation

DOS Version Compatibility

The GVP/PC286 emulator will work with versions of MS/DOS 3.2 or later. Earlier versions will work, but they do not support 80 track floppy disks, which creates a problem when used with the Amiga drives. Unless the user has a 5.25" floppy drive, a 3.5" MS/DOS system disk *(720k format)* is required.

Configuration

The GVP/PC286 leaves the factory with the following default configuration file. Users will want to run the ***Configure*** program to alter these defaults.

- Amiga DF0: = DOS drive A:
- AmigaDOS disk-change recognition OFF
- No hard disk assignments
- Hercules Text emulation
  - 2 colors
  - 8x8 font
- 640k base memory
- 0k Extended memory
- 0k Expanded memory
- Amiga mouse = COM1
  (a Microsoft compatible mouse driver must be supplied)
- RS232 serial port = COM2
- Parallel port = LPT1

Disk Changes under MS/DOS

The Amiga's multitasking nature requires it to closely monitor every time a floppy disk is inserted or ejected. This prevents one program from corrupting data that might be in use by another simultaneously running program.

Users of DOS machines, on the other hand, are quite accustomed to removing and inserting floppy disks at will. If the **Auto Diskchange** button is set to **ON**, the Amiga will continue to monitor floppy drive activity and check or validate any disk, whether MS/DOS or AmigaDOS, as soon as it is inserted. The drive light will come on for several seconds and no activity will be permitted until the disk has been validated.

This can introduce annoying interruptions into a DOS work session. Selecting **Auto Diskchange OFF** disables the AmigaDOS disk checking while working in MS/DOS. In any case, disks will always be inspected and validated as soon as you switch back to AmigaDOS operation.

When running under MS/DOS, you can enable or disable the Auto-Diskchange detection by holding down the ***left Amiga*** key and typing the ***Keypad "2"*** key.

Memory Test

Whenever a DOS machine starts up, it runs through a self-test diagnostic. Normally, this test checks all of your memory chips before proceeding. If you have a lot of memory assigned to Extended or Expanded RAM, you may wish to bypass this part of the self-test.

Pressing the Escape *(ESC)* key immediately after booting into DOS will skip past the memory test.

MS/DOS System Reset

The GVP/PC286 can be reset just as any PC or AT system: simultaneously press the Control *(Ctrl)*, Alternate *(Alt)* and Delete *(Del)* keys. Resetting MS/DOS will ***not*** reset the Amiga.

Moving between AmigaDOS and MS/DOS

As with most other AmigaDOS applications, the PC286 emulator runs as a separate process under AmigaDOS and maintains its own screen. Unless you tell it otherwise, AmigaDOS will continue to run in its own screen behind the DOS screen.

You can swap screens using the ***Left Amiga key*** in combination with either the ***"m"*** or ***"n"*** keys. It is possible to be viewing one screen while your input devices *(keyboard and mouse)* are active in the other. Clicking the left mouse button while viewing a particular screen will activate the input devices for that screen.

PC286 Emulation software

When you run the HD_Install utility on the GVP/PC286 distribution disk, all the necessary files will be copied together into your chosen destination directory. These include the program binary and the various support files *(such as configuration settings, multi-language overlays, etc.)*.

Any time you decide to move these files around, it is important to keep them all together in the same directory. Similarly, if you receive an update disk from GVP, be sure to replace the old file with new ones.

Users should note that they may have to recreate their configuration settings after copying update files to their system.

Running PC286

When PC286 is started, the emulation software automatically detects the memory configuration specified in the configuration file and initializes itself accordingly. Shortly after reset, the following display appears:

```
GVP/PC286/512k Emulator for the Amiga (c) 1991 Great Valley Products

CPU-80286    : 16 MHz      COM1  : MS Mouse    BIOS Version:2.00
NPU-80287    : --          COM2  : RS232       MEMMODE     :NTSC/MB-22
FAST-RAM     : installed   LPT1  : Centronics  Emulator    :GVP/PC286
BASE MEMORY  : 640KB
EXT. MEMORY  : 1024KB      VIDEO : VGA Mono    (c) Copyright 1991
EXP. MEMORY  : --                              Great Valley Products
```

Figure 8.1 – PC286 DOS boot screen.

The various entries in this display can be interpreted as follows:

- CPU80286 – 16 MHz standard for GVP/PC286.
- NPU 80287 – reads Installed only if one is present.
- FAST RAM – displays the amount of RAM on the PC286 board
- Base Memory – 640kb Maximum standard value. This can be reduced using the ***Configure*** program.
- Ext. Memory – Assigned Extended memory. Determined by the settings in ***Configuration*** file
- Exp. Memory – Assigned Expanded memory. Determined by the settings in ***Configuration*** file.
- COM1 – Displays the current assignment of COM1 *(This defaults to Microsoft serial mouse)*
- COM2 – Displays the current assignment of COM2. *(This defaults to RS232)*
- LPT1– Displays the current assignment of the Parallel port
- Video – Displays the assigned video emulation as contained in the ***Configuration*** file.
- BIOS Version – Current version number of the emulator BIOS

- MEMMODE – Current video display arrangement (PAL or NTSC)

- Emulator – Displays current setting of **Mode** menu in ***Configuration*** file.

Using PC286 with Memory Expansions

It is important for all memory expansion products used in conjunction with PC286 to be fully reliable. GVP's ***Faaast-Prep*** disk comes with a utility called ***MemTest***. This should be run before attempting to use PC286 in DOS emulation.

In addition to the standard 640 kilobyte base memory, GVP/PC286 can use up to 6 Megabytes of Extended or Expanded memory. This is much more than a typical DOS machine can support without expensive add-in cards. All RAM available to an Amiga should be transparently useable by PC286.

PC286 and Windows 3.0

Windows 3.0 is a new graphical user interface for PC systems that allow them to work similarly to a real Amiga. Unlike earlier versions of Windows, 3.0 is able to run the 80286 processor in ***Protected*** mode ***(Windows Standard Mode)***. Protected mode for an 80286 chip allows it to directly address up to 16 Megabytes of RAM. This greatly increases its utility for complex operations like graphics manipulation.

In an Amiga that has 5 Megabytes of total RAM installed, for example, up to 4 Megabytes of that memory is available for use

by Windows 3.0 running in Standard mode. This memory is not used merely as data storage *(the normal function of Extended memory)*, but as real, application space where programs can be loaded and run.

To use Windows 3.0 in Standard Mode on the PC286, you will need the following:

- An Amiga with more than 1 Megabyte of RAM.
- At least 10 Megabytes of free hard disk space

Use Configure to assign some or all of your additional memory to Extended memory. Save this setting and start PC286 emulation.

Install Windows 3.0 on your system. It's installation and set-up program will automatically insert the necessary drivers into your CONFIG.SYS file.

Note: Any time you change your system configuration, be sure to include the Windows HIMEM.SYS driver.

Users of Windows 3.0 will probably want to select VGA-Monochrome (640x480) emulation when building their ***Configuration*** file. Otherwise, before starting Windows, be sure to run the utility program ***VGA.EXE***, included on the GVP/PC286 Dos Utilities disk.

Once these preparations are made, you can configure and run Windows 3.0 just as its own documentation describes.

Notes on Windows 3.0 and Display modes

Certain programs cannot run together with Windows 3.0 in Standard Mode. *(e.g. EXCEL 2.01 or WORD 5.0)*. To use these programs with the Extended memory, program updates from Microsoft are required. They are normally reasonably priced ***(after sending in the original disks)***. Otherwise, these products can be used with Windows in Real mode.

If you operate an NTSC Amiga 500 *(USA standard)*, we recommend choosing "Olivetti AT&T PVC-display" *(640*400)* instead of the "VGA-monochrome" display. The reason is that on an NTSC Amiga, the VGA-monochrome screen with its 640*480 resolution does not fit completely into your Amiga-screen ***(you normally have to scroll it up and down with special key combinations described below)***. If you choose to use the Olivetti emulation, substitute "V400" for "VGA" in the above Windows Installation procedure.

Using a RAM-Disk with RAMDRIVE.SYS

To install a RAM-Disk using ***RAMDRIVE.SYS*** the following command must be entered into the CONFIG.SYS file *(using a text editor like EDLIN)*:

```
DEVICE=RAMDRIVE.SYS 1234 /e
```

The Microsoft RAM-Disk driver must be copied from the MS/DOS system disk onto the hard disk C:. The parameter, 1234, above, is your choice for the size of the RAM-Disk *(e.g. 3072 for 3MB)*. Any RAM specified, must, of course, be present in the system.

Note: The RAM-Disk loses its contents as soon as the computer is either switched off or it is reset using the CTRL/ALT/DEL keys !

Expanded Memory

To install Expanded memory the file ***EMM.SYS,*** found on the PC286 DOS Utilities Disk, can be used. The following command must be entered into the CONFIG.SYS file.

```
DEVICE=EMM.SYS
```

Also the EMM.SYS driver must be copied from the DOS-Utility Disk onto the hard disk partition C. After MS/DOS is booted the Expanded memory is installed according to the settings used in the ***Configure*** program. *(EMM.SYS does not support the LIM 4.0 Standard. If you need Expanded memory according to LIM 4.0 you need an LIM4.0-emulator such as Turbo-EMS of Merrill & Bryan).*

Not enough memory ...

Every mounted partition needs RAM, some need more some less. PC286 reserves all its working RAM during start-up long before the hard disk partitions are mounted. Therefore it is possible that the whole machine may hang up without displaying an error-message, because there is not enough memory left to mount the hard disk partitions. There are 3 possible solutions:

- Upgrade your Amiga with more memory
- Reduce the number or size of the hard disk partitions
- Reduce the size of MS/DOS base memory to 512k

Supported Floppy Disk Drives and their Formats

With MS/DOS version equal or larger than 3.2, the PC286 emulates the following disk formats:

Capacity	Sides	Tracks/Side	Format
720KB	2	80	3.5"/5.25"
360KB	2	40	3.5"/5.25"
360KB	1	80	3.5"/5.25"

Using the ***Configure*** program, Amiga floppy disk drives DF0:, DF1: etc. can be assigned to MS/DOS drives A and B .

When the PC286 is loaded, the standard floppy format setting is 3.5" with 720kb. If you have selected an external 360kb floppy drive *(a 40 track unit)* as floppy drive B, you must be sure to use the ***DRIVPARM*** command to ensure that the disk will be correctly formatted to 360kb.

Note: The Amiga 500 does not allow the operation of MS/DOS high density disks (5.25"/1.2Mb or 3.5"/1.44Mb). In spite of this restriction, the PC286 emulator BIOS already contains all relevant functions to handle high density disks. As soon as a usable HD-floppy-kit is available, we will support it with an upgrade.

Amiga mouse/Microsoft Mouse

To install the Amiga mouse as a Microsoft compatible mouse the driver MOUSE.SYS or a compatible driver must be supplied. The following command must be entered into the CONFIG.SYS file:

```
DEVICE=MOUSE.SYS
```

Many programs *(e.g. WORD 5.5)* require their own mouse drivers. Such drivers are delivered with the program. In some cases, the mouse driver is already integrated in the main program *(e.g. Windows 3.0)*. PC286 interprets the original Amiga Mouse as a serial Microsoft Mouse on either COM1 or COM2. All Mouse drivers that use a Microsoft serial mouse are automatically compatible.

The Realtime Clock

If there is an Amiga compatible realtime clock available, it is interpreted by PC286 as an AT realtime clock under MS/DOS. The time and date can be set using the Workbench Preferences program (*see your Amiga user manual).*

File-transfers

To copy files from an AmigaDOS partition to a MS/DOS partition and vice versa, the DOS Utility Disk contains the two small programs ***P2A.EXE*** and ***A2P.EXE***:

- P2A.EXE – PC TO AMIGA, copies a file from a MS/DOS partition into an AmigaDOS partition
- A2P.EXE – AMIGA TO PC, copies a file from an AmigaDOS partition into a MS/DOS partition.

Both utilities are used under MS/DOS with the following format:

C>P2A PCNAME AMIGANAME<ENTER>

C>A2P AMIGANAME PCNAME<ENTER>

The PCNAME is the name of the MS/DOS file.
The AMIGANAME is the name of the AmigaDOS file.

PCNAME: DRIVE:\SUBDIR1\...\SUBDIRn\FILENAME

AMIGANAME: DEVICE:PATH1/.../PATHn/FILENAME

Examples:

PCNAMES: C:\TEST\BIG.TXT
A:FUN.ASC

AMIGANAME: DH0:ASCFILES/PC286/TRANSF.TXT

For the "PCNAME," DRIVE and SUBDIRs can be omitted if the file that should be transferred is located in the same directory as ***P2A*** or ***A2P***. For the "AMIGANAME," the complete path must always be used. Wildcards are not supported. When the transfer is in progress each 64kb of data transferred will be represented by a dot (.) on the display screen.

Appendix A. Keyboard Equivalents

PC286 emulates an 84-key IBM-AT keyboard. The numeric keypad on the Amiga keyboard is available in the same definition as when used in AmigaDOS. The following special key combinations are available during the operation of the PC286:

Note: on older A500 keyboards the left Amiga-key may carry the Commodore-logo instead of the Amiga-logo.

Keys	Function
Left Amiga + Keypad 0	Invert screen (White text on black screen changes to black on white)
Left Amiga + Keypad 1	Scroll Hercules graphic screen Left or Scroll VGA graphic screen up (NTSC)
Left Amiga + Keypad 2	Disk-change recognition under DOS enabled/disabled
left Amiga + Keypad 3	Scroll Hercules graphic screen Right or VGA graphic screen Down (NTSC)
Left Amiga + Right Amiga + S	Hardware Reset of GVP/PC286
Left Amiga + Right Amiga + Q	Quit PC286 and clear program from memory. Restore AmigaDOS.
Ctrl + Alt + Del	Software Reset of MS/DOS

Keys	Function
Left Amiga + N Left Amiga + M	Swap screens between MS/DOS and AmigaDOS
Left Amiga + + Left Amiga + -	Scroll through all available screens under AmigaDOS (+ = forward; - = backward)

APPENDIX B. VIDEO REFERENCE

The programs CGA, MDA, V400, EGA, VGA and INVERS

PC286 supports the following video-emulations:

Mode	Type	Colors	Format
CGA-Mode 0	TEXT	16(1)	40*25 characters
CGA-Mode 1	TEXT	16(1)	40*25 characters
CGA-Mode 2	TEXT	16(1)	80*25 characters
CGA-Mode 3	TEXT	16(1)	80*25 characters
CGA-Mode 4	GRAPHICS	4	320*200 pixel
CGA-Mode 5	GRAPHICS	4	320*200 pixel
CGA-Mode 6	GRAPHICS	2	640*200 pixel
MDA	TEXT	2	80*25 characters
Hercules	GRAPHICS	2	720*348(2) pixel
Toshiba 3100	GRAPHICS	2	640*400 pixel
Olivetti	GRAPHICS	2	640*400 pixel
EGA-mono	GRAPHICS	2	640*350 pixel
VGA-mono	GRAPHICS	2	640*480(3)pixel

Notes:

(1) 16 different colors in CGA textmode can be assigned to 4, 8 or 16 MS/DOS-colors. The number of colors chosen, directly affects the video-output performance of the PC286.

(2) In Hercules-Mode the screen can be scrolled left and right through the 720 pixel resolution by using the "left Amiga + keypad 1" and "left Amiga + keypad 3."

(3) Only important for NTSC operation. In VGA-monochrome mode the screen can be scrolled up and down through the 480 pixel resolution by using the "left Amiga + keypad 1" and "left Amiga + keypad 3" keys.

Switching the video-emulation under MS/DOS

Using the ***Configure*** program, the video-emulation and number of colors can be set. Independent of these settings, the following programs can be used under MS/DOS to switch the emulation mode.

CGA.EXE *(for CGA emulation with 4, 8 and 16 colors)*
MDA.EXE *(for Hercules emulation)*
EGA.EXE *(for EGA-monochrome emulation)*
VGA.EXE *(for VGA-monochrome emulation)*
V400.EXE *(for T3100/Olivetti emulation)*

Using the ***INVERS.EXE*** program, the screen can be switched between normal and inverse mode. These programs can be found on the PC286 DOS Utilities disk. Also, after a DOS reset *(pressing the "Control," "Alternate," and "Delete" keys)*, the configuration set using these programs is srestored.

Note: When CGA.EXE, EGA.EXE, VGA.EXE and V400.EXE are started the number of colors for the 80*25 text-mode can be selected:

CGA 4<ENTER>

If you leave out this parameter, the previously installed number of colors is used.

Command	Function
CGA <ENTER>	selects the CGA adapter with the previously installed number of colors or with the setting that was saved with the Configure program.
CGA 4 <ENTER>	selects the CGA adapter with 4 colors
CGA 8 <ENTER>	selects the CGA adapter with 8 colors
CGA 16 <ENTER>	selects the CGA adapter with 16 colors

The same applies to V400.EXE, EGA.EXE and VGA.EXE.

Switching the Hercules emulation:

Command	Function
MDA <ENTER>	selects the Hercules emulation with the previously installed font or with the setting that was saved with the Configure program.
MDA 8 <ENTER>	selects the Hercules emulation with a 8x8 font (flicker free)
MDA 16 <ENTER>	selects the Hercules emulation with a 8x16 font

Important: The selected graphics adapter and the number of colors are not affected by a DOS Reset *(e.g. CTRL-ALT-DEL).*

The Programs VHIGH, VLOW, SSCR and HSCR

Certain programs synchronize their video memory access to the vertical flyback *(VBL)* from the video controller to produce a flicker free picture. Here they await a pulse of a certain length from the VBL.

As the PC286 video-emulation is software-based, it is not possible to produce a "natural" copy of the VBL pulse. The standard configuration is VLOW *(i.e. a short VBL Pulse)*.

If a program simply hangs after starting, it could be that it is in an endless loop waiting for a long VBL pulse. In this case, reset the PC286 and, before restarting the program, start the ***VHIGH*** program. An example of such a program is the editor from Norton's utilities: ***NE.COM***. ***VHIGH***, if selected, does not stay installed after a system reset. After a reset the video-emulation is once again in ***VLOW*** mode.

Scrolling

SSCR.EXE	switch on the Softscroll-function in text-mode *(Default)*.
HSCR.EXE	switch on the Hardscroll-function in text-mode

With Softscroll enabled (soft = smooth), the scroll is performed with the Blitter. This achieves a smooth scrolling screen at the expense of system overhead. With Hardscroll enabled, the scroll is managed indirectly by the video emulations's screen update.

APPENDIX C. PC286 ERROR-CODES

If during the operation of PC286 an error occurs, the following alert message will be displayed:

PC286 Fatal Loader Error xx
Press any mousebutton

The following error-codes are possible:

Code	Reason	Solution
0	dos.library not found	Switch off and restart A500.
1	Icon.library not found	Copy Icon.library into *libs:*.
2	PC286.cfg not found	Copy PC286.cfg to correct directory or run *Configure*.
3	PC286.cfg is corrupt	Copy PC286.cfg to correct directory or run *Configure*.
4	Insufficient memory	Finish other tasks or switch the A500 off and restart the whole system.

5	PC286.dsg not found	Copy PC286.dsg from the distribution disk to the correct directory.
6, 7	PC286.dsg corrupt	Copy PC286.dsg from the distribution disk to the correct directory.
8	Hardware test failure	Switch off and restart A500.
9	Insufficient memory	Finish other tasks or switch off the A500 and restart the whole system.
10	PC286.bin not found	Copy PC286.bin from the distribution disk to the correct directory.
11	PC286.bin corrupt	Copy Pc286.bin from the distribution disk to the correct directory.
12	PC286 checksum error	Copy PC286 from the distribution disk to the correct directory.
13	PC286 already running	There is only one PC286 task possible.
14	Incompatible memory model	Try another memory model.
15	Floppy DF1: not found	Deselect DF1: with Configure.

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☐ Mail-Order ☐ End-User ☐ Other _____

Unit/Serial # _____ Unit/Serial # _____

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What features/aspects do you like least? _____

Suggestions for improvements: _____

Other GVP products owned: _____

Occupation _____

Primary user
_____ ☐ Male ☐ Female ☐ Family

Age

Uses (check all that apply): ☐ Corporate
☐ Small business ☐ Home business
☐ Personal

Check all that you own: ☐ camcorder
☐ VCR ☐ MIDI synthesizer ☐ PC ☐ C64
☐ A500 ☐ A2000 ☐ A3000 ☐ CDTV
☐ Toaster ☐ Other

How would you rate the following:
(1 = excellent, 5 = poor)
Packaging _____ Ease-of-use _____
Documentation _____ Value _____
Overall quality _____

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☐ Amiga World ☐ Amazing Computing
☐ Other _____

Trade Shows you plan to attend:
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