

GVP

IMPACT
Series II

SERIES II 68030

ACCELERATOR
*Board for the Amiga 2000**

THE ULTIMATE ALL-IN-ONE AMIGA 2000 ADD-ON...
Acceleration/Hard Drive SCSI Controller/Memory Expansion



USER'S GUIDE

GVP

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NOTE:

Please remember to send in your warranty registration card.

INTRODUCTION

Thank you for purchasing our new Series II 68030 Accelerator PLUS SCSI controller combination board for the A2000. This new and revolutionary product, which we will refer to in the remainder of this manual as the "030-Combo" (Oh-three-Oh-Combo) board, truly redefines expansion products for the Amiga 2000. The 030-Combo board has been designed to be inserted in the A2000's "CPU slot" (closest to the power supply) and combines the functionality of the following FOUR expansion boards into a single PCB (Printed Circuit Board):

- High Performance 68030 CPU and 68882 FPU accelerator board.
- Up to two 8MB FAST RAM expansion boards.
- High Performance autobooting DMA SCSI controller.

Your new 030-Combo board incorporates a very high level of integration which has been made possible by GVP's undisputed technological leadership and long expertise in the Amiga peripheral market. For the more technically minded, the 030-Combo board incorporates the following state-of-the-art "high-tech" features:

- 6-layer PCB.
- Surface Mount Manufacturing Technology.
- GVP's custom designed VLSI DMA Peripheral and RAM Controller (DPRC) chip.
- GVP's Custom Designed 32-bit wide 1MByte or 4MByte "SIMM32" memory expansion modules.
- State-of-the-Art, 60ns, 1MBit (22Mhz model) or 4MBit (33Mhz and 50Mhz) DRAMs.
- Fastest 32-bit wide DRAM design in the industry!
- GVP's FaaastROM and FaaastPREP SCSI software technology.

As you are probably aware, the 030-Combo board is available in a number of different models. Each model has a different 68030 CPU and 68882 FPU "clock" speed and may be configured with a different amount of factory installed memory. The following models are foreseen:

- **22Mhz Model.** This version incorporates a 68030 CPU and 68882 FPU running at 22Mhz and comes with 1Mbyte of factory installed, surface mounted, 32-bit wide memory (DRAM). Due to GVP's unique new 60ns DRAM design, this 22Mhz version of the 030-Combo board should outperform other 25Mhz 68030 products on the market, when running most applications.
- **33Mhz Model.** This version incorporates a 68030 CPU and 68882 FPU running at 33Mhz and comes with 4Mbyte of factory installed, surface mounted, 32-bit wide memory (DRAM). At the time of writing there is no competitive product and this product defines a class of its own.
- **50Mhz Model.** This version incorporates a 68030 CPU and 68882 FPU running at 50Mhz and comes with 4Mbyte of factory installed, surface mounted, 32-bit wide memory (DRAM). At the time of writing there is no competitive product and this product defines a class of its own literally turning your A2000 into the fastest Amiga in the world.

All models of the 030-Combo board have three sockets for adding up to an additional 12MB of 32-bit wide memory expansion. Each of these sockets can accommodate either a One Megabyte (1MB) memory module or a Four Megabyte (4MB) memory module. This allows the 22Mhz model to be expanded up to a total of 13MBytes of 32-bit wide memory while the 33Mhz and 50Mhz models can be expanded up to a maximum of 16Mbytes. Note that when adding memory, the special GVP custom designed "SIMM32-1MB-60" or "SIMM32-4MB-60" memory modules must be used. These memory modules are unique in that they have a full 32-bit wide bus interface. It is essential that you purchase original GVP memory expansion modules when adding more memory to your 030-Combo board.

Finally, if you have a SCSI hard disk drive (or other SCSI peripheral) in your system, we strongly recommend that you use the built-in SCSI controller on your new 030-Combo board to drive these peripherals. This means you may have to discard your existing SCSI controller (or maybe

sell it to friend!). The reasons why we strongly recommend the use of the built-in SCSI controller are as follows:

- Saves an Expansion Slot.
- Higher Performance. The built-in SCSI controller is a high performance DMA controller, which — in addition to the normal Zorro II address space — is able to DMA directly to/from the FULL 16Mbytes 32-bit wide Extended RAM located outside the Zorro II space. This is unique, as any controller plugged into a normal A2000 (Zorro II) expansion slot only has access to a maximum of 8Mbytes of FAST RAM for DMA purposes. This has been made possible by the fact that the built-in SCSI controller is directly connected to the 68030's high-speed bus which gives it access to all of the memory that can be "seen" by the 68030 CPU itself (both on the 030-Combo board itself and also all memory anywhere else in the A2000). This of course means that the built-in SCSI controller literally obsoletes all other Amiga 2000 SCSI controllers!
- Removable media support. The onboard GVP SCSI "FaaastROM" driver provides full support for removable media SCSI devices and incorporates all the features of our much acclaimed Series II SCSI controller products.

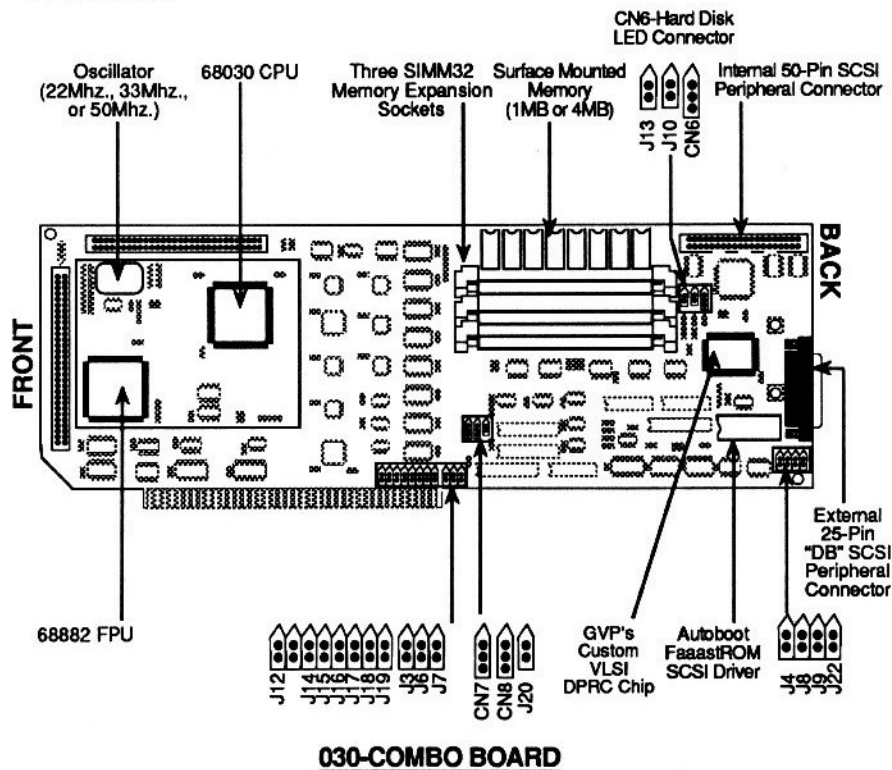
Note that GVP also offers an optional "Hard-Card" adaptor bracket kit for the 030-Combo board. This kit includes a special bracket, all cabling and screws, which will allow a 3.5" hard disk drive to be directly mounted on the back of the 030-Combo board, freeing up one of the peripheral bays in your A2000. We also offer this kit complete with a 1" high (very thin!) 3.5" SCSI hard disk drive with a capacity of 50MB, 100MB or 120MB, depending on the model you choose. All three of these drives offer a very fast average access time of 17ms or less.

Note: The 030-Combo board does not work in the very early A2000 models which have the old 4-layer motherboard made by Commodore in Braunschweig, Germany. These machines were mainly sold in Europe and were never officially sold by Commodore in the USA. GVP does offer other 68030 accelerator products which do work in these older A2000 machines. Contact GVP for more details.

Now please proceed to Chapter Two. We hope you have as much fun using your new 030-Combo board as we had developing it!

INSTALLATION OVERVIEW

Before proceeding with the actual installation of your new 030-Combo board, please take a few minutes to familiarize yourself with the main features and components of the product. This will allow you to better understand some of the terminology used in the remainder of this manual. Below is a diagram highlighting some of the key sections and components:



WARNING: IF YOUR SYSTEM CONTAINS OTHER FULLY OR PARTLY POPULATED MEMORY EXPANSION BOARDS IN ONE OF THE "ZORRO II" EXPANSION SLOTS, PLEASE REMOVE THESE OTHER MEMORY EXPANSION BOARDS OR ELSE MAKE SURE YOU FULLY UNDERSTAND THE 8MB LIMITATION OF THE ZORRO II "AUTO-CONFIG" PROTOCOL AND ALSO THE LOWER OVERALL SYSTEM PERFORMANCE WHICH WILL RESULT WHEN USING SUCH 16-BIT WIDE MEMORY EXPANSION.

THE TOTAL AMOUNT OF OTHER (not on the 030-Combo board) MEMORY EXPANSION (ADD 2MB IF A COMMODORE PC BRIDGEBOARD IS INSTALLED) PLUS THE TOTAL AMOUNT OF 32-BIT WIDE AUTO-CONFIGURED MEMORY ON THE 030-COMBO BOARD MUST BE LESS THAN OR EQUAL TO 8MB, OTHERWISE THE A2000 SYSTEM WILL NOT FUNCTION WHEN THE 030-COMBO BOARD IS INSTALLED. SEE CHAPTER 3 FOR MORE DETAILS.

Now that you have a better understanding of the main components of your new 030-Combo board, you should proceed as follows through the remainder of this manual:

- If you have purchased any of the optional GVP SIMM32 memory modules and you want to install additional 32-bit wide memory, follow the instructions in Chapter 3, otherwise skip Chapter 3.
- If you have purchased the optional "hard-card" kit or you want to connect a SCSI hard drive to the 030-Combo board, follow the instructions in Chapters 4 and 5. If you do not need to use the SCSI controller feature at this time, skip Chapters 3 and 4.
- After having installed any optional memory or SCSI peripherals, proceed to Chapter 6, to physically install the 030-Combo board into your Amiga 2000.
- Finally, do the software installation and hard disk formatting as explained in Chapters 7 and 8. After this you are ready to go!
- If you own a Commodore PC A2088 or A2286 "Bridgeboard" and you want to use a SCSI hard disk (connected to the 030-Combo board) from MS-DOS, carefully read Chapters 9, 10 and 11. If you do not have a Bridgeboard in your system skip these chapters.

All other Chapters in this manual contain useful supplementary information which you can read at any time you wish, possibly after you have used the product for a while and are more familiar with all its many features and options.

INSTALLING ADDITIONAL 32-BIT WIDE MEMORY (DRAM)

Your 030-Combo board is equipped with 1MByte (22Mhz model) or 4MByte (33 and 50Mhz models) of factory installed, surface mounted, 32-bit wide, high performance, memory (DRAM). Refer to the diagram in Chapter 2.

In addition, the 030-Combo board allows up to 12Mbytes of additional user installable 32-bit wide memory (DRAM) expansion to be installed. This allows the 22Mhz version to be expanded up to a total of 13Mbytes, while all other models can be expanded up to a maximum of 16Mbytes.

Memory is expanded by installing one, two or three Single In-line Memory Modules (SIMMs). The 030-Combo Board requires the so-called "SIMM32" SIMMs, which have been custom designed by GVP and have a direct 32-bit wide interface.

Due to limitations of the original Amiga 2000 Zorro II "auto-config" architecture, the standard Amiga 2000 auto-config protocol only allows a maximum of 8Mbytes of "fast" (expansion) memory address space to be auto-configured. As is the case with the newer Amiga 3000, the GVP 030-Combo board has been specifically designed to allow this 8MByte barrier to be overcome. As a result of this, the 030-Combo board offers a wide choice of memory configuration options which at first may seem to be confusing. If you do not understand the details explained in this chapter, we recommend that you consult with your local GVP dealer.

Due to this 8MB auto-config limit imposed by the A2000's Zorro II bus architecture, it is important to understand that a part of the 32-bit wide DRAM on the 030-Combo board can be configured to participate in the standard Zorro II auto-config protocol (we will call this "Auto-Config RAM") while the remainder of the 32-bit wide DRAM is automatically "auto-configured" by the GVP FaaastROM driver code when the system is initialized (we will call this "Extended RAM"). The configuration decision as to how much of the DRAM is to be treated as Auto-Config RAM and how much as Extended RAM is made by means of the jumpers J10 and J13 (refer to diagram in Chapter 2).

There are a number of factors which will determine how much (or all!) of the 32-bit wide DRAM must be treated as Extended RAM. The general AmigaDOS rule is to try to configure as large a chunk as possible

as Auto-config RAM, with the balance being treated as Extended RAM. For those users who run Unix more often than AmigaDOS, it may be beneficial to configure all of the 32-bit wide DRAM as Extended RAM, providing one large contiguous RAM space, which is required by the Unix operating system.

Note that from a hardware point of view the main difference between Auto-config RAM and Extended RAM, is that any DMA peripherals plugged into the Zorro II expansion bus cannot directly DMA to/from Extended RAM, as this RAM is outside the 8MB address space defined by the ZorroII expansion bus. The software drivers for such peripherals need to be aware of this RAM as it must be "masked" out so that such drivers will know not to directly DMA to/from this memory. Note that AmigaDOS does in fact define such a "non-DMA memory" masking scheme, which can generally be set through a hard disk "prep" program or mountlist entry in the DEVS: directory. Examples of DMA expansion boards which could have problems with Extended RAM (if not configured properly) would be the Commodore A2090, A2090A, A2091, and the Microbotics Hardframe SCSI controllers. However as we have recommended earlier, the performance and features of the built-in SCSI controller on the 030-Combo board is such that anyone who owns any of these controllers should simply discard (or sell!) them and switch to using the built-in SCSI controller of the 030-Combo board. This "DMA to/from ALL RAM" is in fact one of the main features of the built-in SCSI controller, significantly contributing to its performance (especially when operating on RAM outside of the 8MB Zorro II bus limit).

Note that all GVP Series II DMA controllers designed to plug into the normal Zorro II expansion bus, with V3.09 (or later) FaaastROM drivers, automatically handle Extended RAM without any problems and no special action or configuration is required. However the built-in 030-Combo board SCSI controller will out perform even those great products, hence you will always be better off using it instead.

As long as the 8Mbyte limit for Zorro II auto-config devices is not exceeded (see above), it is also possible to keep old 16-bit wide RAM expansion cards as "emergency memory". These 16-bit wide RAM expansion cards would be any RAM expansion cards plugged into one of the Zorro II expansion slots of the A2000. Note that no matter how memory is configured, fast 32-bit wide RAM on the 030-Combo board will always be used first before any slow 16-bit wide memory sitting in one of the Zorro II slots. This means that until the system runs out of 32-bit wide

RAM, all applications will ignore the presence of slow RAM and will run at full speed. However, as was stated before, it is critical to ensure that the total amount of Zorro-II Auto-config expansion space used is never more than 8MB. Remember that the Commodore A2088/2286 PC Bridgeboard also uses up 2MB of Zorro-II Auto-config space. If a system is configured with more than 8MB of Zorro-II Auto-config space, it will not work!

Note that in the "Real World", there could be some applications which will not work correctly with Extended RAM on the 030-Combo board. HOWEVER, these applications will generally also NOT work on an Amiga 3000! The reason for this is that the Amiga originally could access only a total of 16MB of address space (including up to 8MB of so-called Fast RAM, Kickstart ROM space, I/O space, etc.) and some programmers made illegal assumptions in their programs. Therefore some programs (including, for example, AmigaBASIC) will not work properly if an Amiga contains memory outside this so-called "lower 16-Mbyte area." Some other programs, mostly games and applications that take over the machine, will continue to work with Extended RAM, but simply ignore its presence.

Even though this is clearly the programmer's fault—for years Commodore has expressly warned about these kinds of compatibility problems—it might nevertheless be necessary to configure the 030-Combo in a way so that everything appears to be normal for that ill-behaved application program. In case of games that would run faster with 32-bit memory, but do not automatically detect Extended RAM, one of the mixed-mode configurations (Zorro-II plus Extended RAM) should be used. Fortunately, most of these programs are currently being updated to fix these types of problems, and since the on-board RAM on Commodore's A3000 cannot be configured to look like Zorro-II RAM, more and more developers will refuse to publish (and more and more users refuse to buy!) ill-behaved software that does not conform to Amiga programming standards. As a general rule of thumb: If a program works on an A3000, it will also run on an 030-Combo with Extended RAM. Device drivers for DMA controllers also have to be aware of the presence of RAM that cannot be reached by Zorro-II DMA, so that data are transferred by means of "Programmed I/O" (Commodore's A2091 uses this technique) or via a DMA buffer located in Zorro-II space (GVP's Series II Zorro-II SCSI controller). Note that the on-board SCSI controller that is part of the 030-Combo does not have to resort to any of these workarounds: it can use all memory for DMA!

The following tables outlines the valid RAM expansion configurations which are possible with the 030-Combo board:

22MHz. RAM CONFIGURATION TABLE

Total RAM	Auto-Config RAM	Extended RAM	Quantity & Type of SIMM	SIMM Location	Jumper Settings
1 MB	1 MB	0 MB	Surface Mounted	N/A	J10-Open
2 MB	2 MB	0 MB	1 x SIMM32-1MB-60	CN11	J13-Shorted (1MB SIMMs only, all Auto-config RAM)
4 MB	4 MB	0 MB	3 x SIMM32-1MB-60	CN11 - CN13	
1 MB	0 MB	1 MB	Surface Mounted	N/A	J10-Shorted J13-Shorted (1MB SIMMs only, all extended RAM)
2 MB	0 MB	2 MB	1 x SIMM32-1MB-60	CN11	
3 MB	0 MB	3 MB	2 x SIMM32-1MB-60	CN11, CN12	
4 MB	0 MB	4 MB	3 x SIMM32-1MB-60	CN11 - CN13	
1 MB	0 MB	1 MB	Surface Mounted	N/A	J10-Shorted J13-Open (4MB SIMMs only, all extended RAM)
5 MB	0 MB	5 MB	1 x SIMM32-4MB-60	CN11	
9 MB	0 MB	9 MB	2 x SIMM32-4MB-60	CN11, CN12	
13 MB	0 MB	13 MB	3 x SIMM32-4MB-60	CN11 - CN13	
1 MB	1 MB	0 MB	Surface Mounted	N/A	J10-Open J13-Open (Mixed Mode: Both Auto-config and extended RAM)
2 MB	2 MB	0 MB	1 x SIMM32-1MB-60	CN11	
6 MB	2 MB	—	1 x SIMM32-1MB-60	CN11	
		4 MB	1 x SIMM32-4MB-60	CN12	
10 MB	2 MB	—	1 x SIMM32-4MB-60	CN11	
		8 MB	2 x SIMM32-4MB-60	CN12, CN13	

33MHZ. AND 50MHZ. RAM CONFIGURATION TABLE

Total RAM	Auto-Config RAM	Extended RAM	Quantity & Type of SIMM	SIMM Location	Jumper Settings
4 MB	0 MB	4 MB	Surface Mounted	N/A	J10-Shorted J13-Shorted (All extended RAM)
8 MB	0 MB	8 MB	1 x SIMM32-4MB-60	CN11	
12 MB	0 MB	12 MB	2 x SIMM32-4MB-60	CN11, CN12	
16 MB	0 MB	16 MB	3 x SIMM32-4MB-60	CN11 - CN13	
4 MB	4 MB	0 MB	Surface Mounted	N/A	J10-Open J13-Shorted (Mixed Mode, up to 8MB Auto-config RAM)
8 MB	8 MB	0 MB	1 x SIMM32-4MB-60	CN11	
12 MB	8 MB	—	1 x SIMM32-4MB-60	CN11	
	—	4 MB	1 x SIMM32-4MB-60	CN12	
16 MB	8 MB	—	1 x SIMM32-4MB-60	CN11	
	—	8 MB	2 x SIMM32-4MB-60	CN12, CN13	
4 MB	4 MB	0 MB	Surface Mounted	N/A	J10-Open J13-Open (Mixed Mode, 4MB Auto-config RAM, use with Bridgeboard)
8MB	4MB	4 MB	1 x SIMM32-4MB-60	CN11	
12MB	4MB	8 MB	2 x SIMM32-4MB-60	CN11, CN12	
16MB	4MB	12 MB	3 x SIMM32-4MB-60	CN11- CN13	

Note: Only 4MB SIMMs can be used in these two models.

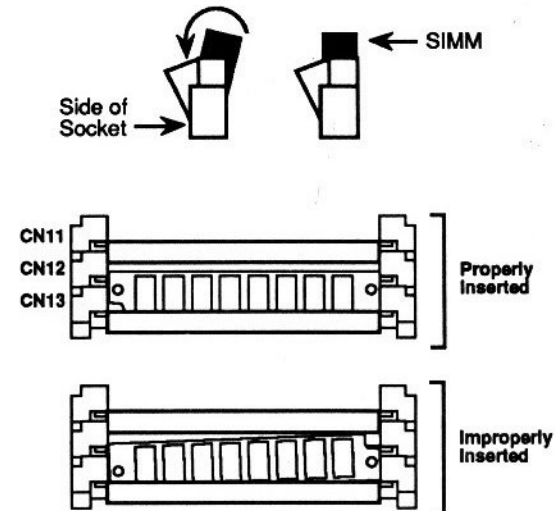
Once you have determined how much and what type of RAM you are going to install follow these simple steps in order to complete the installation of your additional RAM. In addition, since both the 1MB and the 4MB SIMMs are almost identical, the installation for both types of RAM are the same.

Note: In order to prevent damage to the '030 board or to the additional RAM, it is important to work in a static free environment. Working on the anti-static bag your board came in is a good idea.

Step #1:

First locate the three RAM expansion sockets in the middle and near the top of the '030 board (refer to the diagram in Chapter Two for the location of the sockets). These sockets can only accommodate the GVP SIMM32-1MB and the GVP SIMM32-4MB and will be severely damaged if any other RAM is attempted to be installed.

Once you have located these sockets, all you have to do is place the additional SIMM in the socket with the tiny silver 'fingers' of the SIMM facing down in the socket. Now, with the 'fingers' firmly placed in the socket you should lock the SIMM in place by gently rotating the SIMM



Note: SIMMs must always be installed from the top socket (CN11) down. i.e.: insert SIMM in CN11 first, then CN12, then CN13.

back towards the board and letting it snap into place. Above are three diagrams illustrating this motion, an improperly inserted SIMM and a properly inserted one.

Step #2:

Now check to see if all of the SIMMs silver 'fingers' are making contact and that the locking tabs on either side of the socket are 'holding' the SIMM in place.

Make sure the two small plastic tabs on either side of the SIMM socket snap into place with the tabs holding down the SIMM itself. You may have to push down firmly on the two top corners of the SIMM to get these two tabs to snap into their correct position.

Once this has been checked, you can repeat step one for any other additional SIMMs you plan to install.

Step #3:

Correctly set the RAM configuration jumpers J10 and J13 as per the RAM configurations tables shown earlier in this chapter. Note that "SHORTED" means that the small plastic "jumper" must be installed to cover (i.e.: short) the two pins of the jumper pins. Refer to the diagram in Chapter 2 for the location of the jumpers J10 and J13.

Now (re)install the 030-Combo Board as per Chapter 6.

Step #4:

Boot your system from the Faaastprep installation floppy disk supplied with the 030-Combo Board. Run the memory (RAM) test by double clicking on the RAM-test icon in the root directory of the Faaastprep installation disk. The memory test will test all the memory available in your system and report any memory errors it finds. If the system does not boot or memory errors are found, check to make sure that the SIMM32 memory modules are correctly installed and that jumpers J10 and J13 have been configured correctly. Also make sure that there is not more than 8MB of total Zorro-II Auto-config memory expansion in your system. If you have a Commodore A2088 or A2286 PC Bridgeboard installed in your A2000, remember to add in the 2MB of Zorro-II Auto-config memory space it uses. Once you are sure all the above has been checked and found to be correct, contact your local GVP dealer in the unlikely event that memory errors still occur.

ADDING SCSI HARD DRIVES TO THE 030-COMBO BOARD

The SCSI interface is a standard for high performance hard disk interfacing. The SCSI hard disk interface built onto your GVP 68030 board is a high speed interface that allows up to seven SCSI devices to be connected to the same controller via a daisy chain cable. Having the SCSI interface directly on the 030 board let's you add a high performance auto-booting hard disk to your Amiga without using a valuable expansion slot for an additional hard disk controller card.

Note: Your Amiga must have KickStart version 1.3 or later installed in order to Auto-Boot and Jumper J4, on the 030-Combo Board, must be removed.

Up to seven SCSI peripheral devices can be attached to any GVP 030-Combo Board. These devices may be hard disk drives, tape drives, CD-ROMs, etc. There are a few concepts to understand about the SCSI interface that should be explained before you do the actual installation.

SCSI ID:

Each SCSI peripheral must have its own SCSI ID. SCSI IDs range from zero to seven. However, the 030-Board's SCSI controller itself uses SCSI ID number seven. Therefore no other SCSI peripheral may use a SCSI ID = 7.

Terminating the SCSI Bus:

Since SCSI devices are chained one after another in a "daisy chain", the last device needs some special attention. The end of the SCSI bus must be terminated with *terminating resistors*. Terminating resistor packs are small plastic packages, usually with eight pins coming out of them. The figure below shows a typical resistor pack:

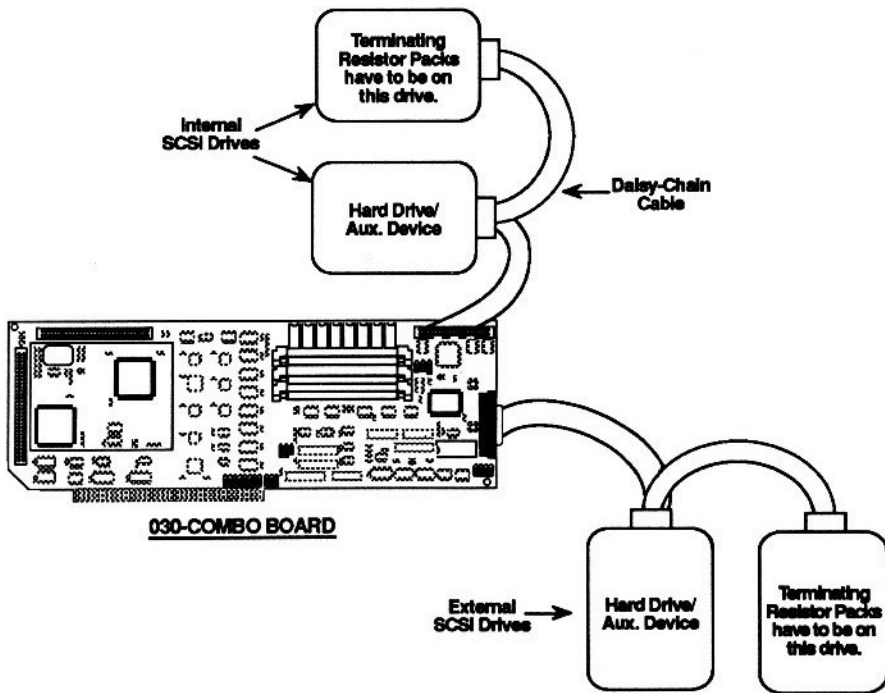
Note: Some SCSI peripherals do not have terminating packs, instead they have terminating plugs/connectors which serve the same purpose. Please refer to the appropriate user's guide for more information.



Only the last SCSI device in the chain should contain the resistor packs. It is essential that the terminating resistor packs are removed from all but the last SCSI device. If there are both internal and external SCSI devices, then both the last internal and the last external SCSI devices are considered to be the last device, therefore requiring the terminating resistor packs. This means that all the terminating resistor packs have to be removed from all the other SCSI devices.

Cabling:

When multiple SCSI devices are used, there are special cabling considerations to be taken into account. When only internal SCSI devices are being used, a "daisy-chain" cable is used. This cable is a flat 50-pin ribbon cable with multiple connections. In other words, this cable can be started at one SCSI device and then connected to a second and then to a third and so on.



Example of Cabling for Connecting Multiple SCSI Devices

If external SCSI devices are being used, they need a different cable. The cable they use is wrapped in a thin metal foil providing a shield as per FCC regulation. This is necessary so that the signals leaving your computer do not interfere with other electronic devices. This cable attaches to the back of the GVP Impact Series II controller through a 25-pin connector. The other end of the cable usually has a 50-pin shielded connector which attaches to the external SCSI device. Both the internal and external SCSI cables are available through your authorized GVP dealer or directly from GVP.

Enabling the SCSI Device Driver

When connecting one or more SCSI drives to your 030-Combo Board, the software SCSI device driver must be enabled. This is done by removing the plastic "jumper" installed on the pins of jumper J4. See diagram in Chapter 2 to locate J4. Removing jumper J4 will activate the SCSI device driver which will allow Auto-booting directly from a SCSI hard disk. Also make sure that jumper J9 is installed (shorted).

INSTALLING A 3.5" SCSI HARD DRIVE IN THE AMIGA A2000

Installing the Hard Disk

Now it is time to install the hard disk itself. You can mount the hard disk in the spare 3.5" drive bay (to the left of the single floppy disk drive) or use a special adapter to mount the drive in the 5.25" drive bay underneath the floppy drive. You can also use a special adapter, available from GVP, in order to mount a 3.5" hard drive directly to the '030-Combo Board itself. If you have two internal floppy drives you will have to install the drive in the 5.25" bay; if you have the Bridgeboard's 5.25" drive installed you will have to mount the SCSI hard drive in the 3.5" bay. It may be necessary to remove one or more expansion boards from the Amiga to get access to the mounting screws. If you do need to remove any expansion boards from the system, be sure to make a note of their location and any cables that are attached to the expansion boards so they can be reinstalled properly.

Mounting the SCSI drive in the 3.5" bay

If you are mounting the SCSI drive in the 3.5" bay, you will need to remove the metal plate that the floppy drive is mounted on. This plate is secured with four screws, two on each side of the plate. After removing the mounting plate, attach the SCSI drive securely to the plate using the four screws provided. The SCSI drive will have its connectors facing the rear of the computer just like the floppy's connectors. There are two sets of mounting holes on the plate-choose the set that will set the SCSI drive further back into the A2000 to ensure that the computer's cover will fit back in place.

Once the drive is securely mounted, replace the mounting plate, attach the other end of the 50-pin ribbon cable to the connector on the SCSI drive, and attach one of the spare 4-pin power connectors, from the power supply, to the drive as well. Both the 50-pin ribbon cable connector and the 4-pin power connector are keyed to prevent incorrect insertion and can only be inserted in one orientation.

Mounting the SCSI drive in the 5.25" bay

If you are mounting a 3.5" SCSI drive in the 5.25" drive bay, you will need to obtain a set of adapter rails from GVP. These adapter rails attach to each side of the SCSI drive and provide mounting holes so that the

drive can be secured to the computer's chassis. Attach the two mounting rails to the 3.5" SCSI drive with the four screws provided (two per rail), then slide the drive (connector first) into the 5.25" drive bay from the front of the machine. When you have rails matched to the mounting holes on the chassis, fasten the rails to the machine, connect the 50-pin ribbon cable to the drive, and then connect one of the spare 4-pin power connectors to the drive. Both the 50-pin ribbon cable and the 4-pin power connector are keyed to prevent incorrect insertion and can only be inserted in one direction.

Mounting the SCSI drive on the '030 board itself

If you are mounting a SCSI drive on the '030 board itself you must first obtain the GVP Series II '030 hard drive mounting adapter. This adapter allows one 3.5" hard drive to be piggy backed on the '030 board itself. This will not interfere with any other slot in your A2000 and saves a peripheral bay.

Please refer to the installation instructions that come with this special adapter in order to mount a hard drive on the '030 board.

Connecting the Hard Disk LED

Once the hard disk has been mounted in the computer, locate the twisted cable coming from the LED indicators on the front panel of the A2000. One of the pairs of wires are for the power indicator. These wires go right to the motherboard of the A2000 while the other set of wires are for the hard disk LED. This LED on the front panel, right under the power LED, is used to indicate when the hard disk is being accessed. On the end of this pair of wires is a small three pin connector.

This three pin female connector gets inserted over a three pin male connector on the '030 board itself. This connector is located towards the back of the board (to the right of the SIMM sockets) and is labeled CN6 (see diagram in Chapter 2). In order to connect these two together all that is necessary is to slide one over the other. Orientation does not matter so long as all three pins get covered (e.g. no pins are hanging out or not connected).

INSTALLING THE GVP SERIES II '030 ACCELERATOR IN THE AMIGA A2000

This chapter will describe the physical installation of the GVP Series II '030 card in the Amiga A2000. We suggest that you read this installation first so that you become familiar with it and then proceed to do the actual installation.

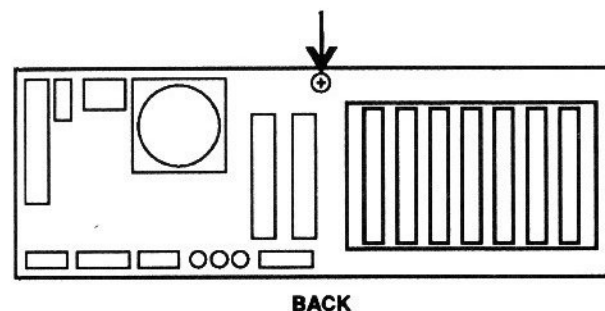
The first step is to determine which, if any, options you are going to install. The reason for this is that you should perform the installation in a specific order so that the installation is as simple as possible. In other words, if you are adding the optional piggyback hard drive bracket or if you are adding RAM, do that first and then install the actual card in the A2000.

You will only need two Phillips head screwdrivers to install the GVP Series II '030 board. You will need a larger one for the five screws that hold the Amiga's case on and a smaller one for the mounting brackets needed to secure the '030 board to the A2000. If you do not feel comfortable working inside your Amiga, then have your dealer install the board for you. It is essential that you ground yourself to the Amiga's chassis, by touching an unpainted metal surface, before handling any GVP product. Please note the following:

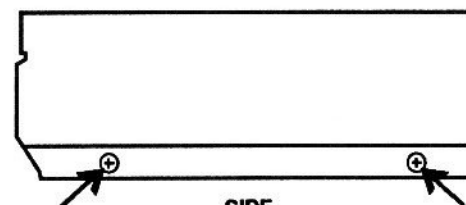
The components on the GVP board are static sensitive. When you remove your GVP board from its box, you will notice that it is in a special plastic bag. This bag protects the board from any static electricity that might harm the board. It is important to remove the board in the most static-free environment possible. Also, it is important to keep the original packaging of the GVP board in case you must ship it somewhere.

Begin by turning off your Amiga and disconnecting the power cable from the back. The Amiga's case is secured by five Phillips head screws; two of them are located on each side of the case, near the bottom with fifth located on the back of the machine. (Please refer to the diagram on the next page.)

Remove these five screws and put them aside in order to close the case after the installation. After removing the screws, gently slide the Amiga's case forward (towards the front of the Amiga), then lift it off and put it somewhere close at hand.

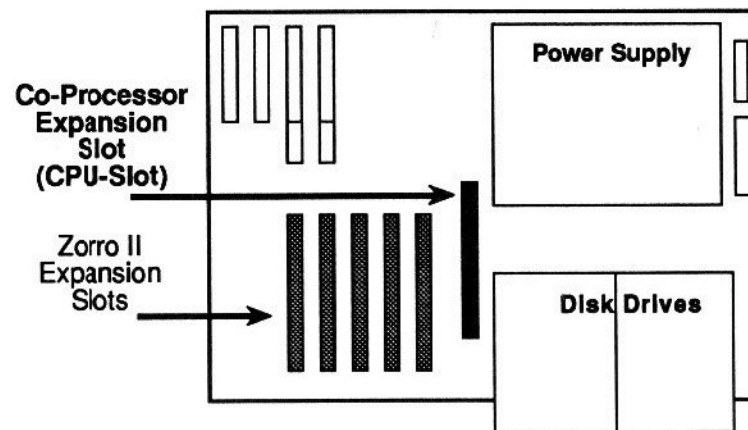


BACK



SIDE

Now that you have the cover off, be sure to ground yourself by touching the exposed metal on the chassis. Locate the co-processor (or "CPU-Slot") expansion slot on the motherboard, just to the left of the disk drives (see diagram below).



If there are any cables obstructing access to the co-processor slot (e.g. bridgeboard floppy drive cable or hard drive cables), remove them now being careful to remember which cables go where and what orientation they are in. Unscrew the metal cover plate from behind the co-processor slot, (the cover closest to the power supply) and save the screws. Remove the 68030 board from the protective anti-static bag.

Before inserting the board into the co-processor slot, check the jumper settings on the board against the defaults shown in the tables in Chapter 16 and make sure J4, J10 and J13 have been correctly configured as per the instructions in the previous chapters. There is a small plastic 'card guide' mounted to the front of the Amiga's chassis in front of the co-processor slot. The '030 board should slide into the card guide as you insert the board into the co-processor slot. The '030 board has a small angle cut into it on the front bottom corner, use this to help you angle the '030 board into place.

In order to firmly seat the 030 board in the co-processor slot you should press firmly on the top of the 030 board near the front of the board. Now attach the rear mounting bracket using the screws that are provided.

At this point the physical installation of the GVP '030 board is finished. If you added any optional SCSI drives, now is the time to connect one end of the 50-pin SCSI cable to the '030 board. Refer to Chapter Two in order locate this connector. All SCSI cables from GVP are keyed so that an improper connection is not possible. The cables only attach in one direction.

Now re-attach any cables you removed in the previous step and slide the case back over the Amiga. When replacing the cover, take special care to make sure that no cables get pinched between the cover and the case. Once the case is over the top of the machine, loosely insert the five screws you removed in step one but do not tighten any of them until you are sure all the screws line up properly.

Once the case has been tightened, make sure the power switch is in the off position (i.e. bottom half of the switch depressed) and then re-connect the power cord. Now you are ready to boot the computer. Insert the GVP Installation Disk and turn on the power switch. If the board is installed properly the computer will boot normally from the floppy drive. If the Amiga fails to boot turn the power off and re-check your installation and jumper settings. If you need assistance call your authorized GVP dealer or GVP's technical support department.

The GVP FaaastPrep disk provided with the 030-Combo Board contains some test programs and special utilities designed to let the Amiga take advantage of the increased power of its new 68030 micro-processor. The most important of these is a command called SetCPU. Note that if you have installed a hard drive using GVP's FaaastPrep software and you let FaaastPrep copy the complete GVP diskette to the hard drive then this command has already been installed for you. If not then copy the SetCPU command, from the GVP utilities drawer, from the GVP diskette to the C directory of your booting drive.

Then add the following command line to your startup-sequence about 5 lines down:

SETCPU CACHE FASTROM

This will enable the caches on the 030 and in addition will re-map the KickStart 16-bit ROM from the motherboard into fast 32-bit RAM in order to improve system performance.

If you have a SCSI hard drive which was previously "prepped" and used with another SCSI controller (not the one on the 030-Combo Board itself), you may have to re-prep (and in some cases re-format) such a drive when it is connected to the 030-Combo Board's SCSI controllers. The reason for this is that older A2000 SCSI controllers do not adhere to Commodore's Rigid Disk Block (RDB) standard for Auto-booting and partitioning of hard disks. In addition, even if such a drive was "prepped" with software which does follow the RDB standard, it will probably be necessary to re-prep the drive, changing only the "DMA Mask" parameter in the RDB. See Chapter 8 for details.

Also contained in the root directory of the Faaastprep installation disk supplied with the 030-Combo Board are two other useful utilities for diagnosis or general troubleshooting of your A2000 system. These two utilities are:

1. Memory test. This will test all the available memory in the system and let you know if it is ok.
2. GVPinfo. This utility will provide details about your configuration and can best be described as a "system sleuth!"

PARTITIONING AND FORMATTING USING FAAASTPREP™

Included with your GVP 030-Combo Board is a disk called FaaastPrep™. On this disk is a program by the same name that is used to prepare (prep) and format any SCSI hard drive.

Note that the Faaastprep utility "talks" to the GVP SCSI device driver which is contained in a special EPROM (Read Only Memory chip) on the 030-Combo Board. This device driver is automatically started and loaded when the system is booted up and jumper J4 has been removed (see Chapter 4). The GVP SCSI device driver is call GVPSCSI.device.

In order to utilize the full power of FaaastPrep™, we will first give you a brief overview of this utility. When executing this utility by double clicking on the FaaastPrep™ icon, you will be presented with a start-up screen offering you several options. Your first choice is whether you are going to use this utility with a SCSI drive or an AT/IDE drive. Since this controller uses a SCSI interface you should not have to change the default, just make sure the gadget in the middle of the screen says SCSI. If this gadget is displaying "AT" then click on it once to change it to "SCSI"

The next option concerns automatic versus manual installation. The following is a brief description of both choices followed by a quick set-up guide:

Automatic: This is the easiest of the two selections when installing a hard drive. This option requires a minimum of input from the user and is the fastest way to set up your hard drive. The Automatic Installation mode is appropriate for novice users, as well as for those who desire a rapid hard drive installation without the immediate need for special options.

Manual: This option gives the experienced user total control over their hard drive. Parameters such as boot priority, mask settings, and buffer size may be altered for any partition even after the drive has been previously partitioned and already contains data. Other parameters such as low and high cylinders are also alterable. The manual mode contains other features explained later on in this chapter and is recommended for the experienced user only.

Partitions: A hard disk drive may be split into one or more "partitions." More than one partition is useful as it also provides more

protection against system crashes. However, note that all removable media drives should be partitioned as a *single* partition.

Quick Set-Up:

Step #1:

Double click on the FaaastPrep™ icon.

Step #2:

Click once on the Automatic Installation gadget.

Step #3:

Now enter the number of partitions you would like in the "Number of Partitions" gadget. Remember to enter a return after you enter the number for the amount of partitions. FaaastPrep™ will automatically calculate the necessary information. If you do not know what a "Partition" is, simply enter "1" here, for creating a single partition. If you have a Commodore A2088 or A2286 PC Bridgeboard, you should create at least two partitions. One for AMIGADOS and one for MS-DOS use, if you want to use your SCSI hard drive for the "PC-side" as well as for the "Amiga-side."

Step #4:

Click once on the "Prep/Format" gadget. This will prep and format your SCSI drive. Note: This will completely erase all data currently on the drive. When this is finished FaaastPrep™ will ask if you want to copy any disks to the hard drive - all you need to do is click once on the proceed gadget. This will copy the contents of the GVP install disk to your hard drive.

Note: FaaastPrep™ will ask you if you want to copy other disks to the first partition you created earlier. This is simply a disk copy and is offered as a convenience, not as a means to install software as some software requires special installation routines. If you do not want to copy any disks to your partition then just click on the "Abort" gadget.

Step #5:

Once FaaastPrep™ has finished and you have acknowledged that there are no more "preppable" drives, click once on the "Quit" gadget.

Now eject the FaaastPrep™ disk and re-boot your Amiga. Your system should now auto-boot directly off your newly installed hard drive.

Notes on the Automatic Mode: In the Automatic mode you may change some of the displayed features when performing an installation. For example, if you do not like the default partition names you may change them by positioning the cursor, with the mouse, over the gadget that displays the partition name that you wish to change and then click once. Just delete the old name and enter the new name followed by a return. You can also change the partition sizes if you wish by using the same method for changing the partition names. Just as a reminder- You must click on the "Prep/Format" gadget for this information to be sent to the drive. This will erase any data currently on the drive. If you wish to change information, such as partition name, and you wish to retain the data on the drive you must use the Manual Installation mode.

Manual Installation Features: The manual installation mode of FaaastPrep™ was designed to give the advanced user total control over the hard disk. Rather than explaining how to do particular tasks we will explain and define all the features available to you via the manual installation mode.

Information such as partition name, buffer size, boot priority, and mask values can be changed without losing data on the drive. As you will see from the manual screen, there is a lot of data to look at. In the middle of the screen, on two lines, is information about the drive itself. This information includes: Name, ID, Rev, Size, LowCyl, HiCyl, Heads, Sectors, and Blocks. All the data displayed here is either returned from the drive or calculated by FaaastPrep (e.g. Size is calculated from the total number of available blocks times the block size. Then the amount of cylinders required to store the RDB data is subtracted from the size and rounded down to give you the final formatted capacity. This value is then displayed in the size gadget). Located just below the general information about the drive is a grid of specific information about the drive's partitions. Each row, or line, indicates an individual partition structure. This structure information includes: Size, FileSys, LowCyl, HiCyl, BootPri, Mem, Buffers, Mask, and Partition Name. Below are the definitions for these features:

Size: Specifies the size, in megabytes, of each of the partitions.

FileSys: This is the files system type that is to be used on the partition. FFS-Fast File System, OFS-Old File System, AFS-Alternate File System (not implemented). Normally this is set to FFS.

LowCyl: This is the lowest logical cylinder value for the partition. This value is calculated automatically if the "Auto" gadget, in the lower right hand corner, is clicked on.

HiCyl: This is the high logical cylinder value for the partition. This value is calculated automatically if the "Auto" gadget, in the lower right hand corner, is clicked on.

BootPri: This specifies the booting priority of the partition. Boot priorities indicate to the system which device it must boot from. All bootable devices have a priority assigned to them in order to determine what the system will boot from. Your Amiga will boot from the device with the highest BootPri value. Please refer to your Amiga manual for more information on boot priorities. Some considerations are given below.

GVP SCSI Device Driver and Boot Priorities.

Starting with driver version 3.08 of the gvpscsi.device, a completely redesigned booting-strategy has been implemented. This new algorithm allows SCSI target IDs to be assigned to SCSI devices in any order- one will no longer suffer from a long delay at boot-time if there is no SCSI ID 0 connected to the host adapter, or if no cartridge is inserted into a removable-medium device. Also, the "Last Disk" flag as used by GVP's FaaastPREP utility is no longer required - in fact, it is now simply ignored by the device driver. To minimize delays during autobooting, the driver will no longer wait for slow SCSI devices to become ready, instead, it will immediately boot off the first bootable partition it can find.

These improvements, however, may require a few minor changes to be made to your setup if you have more than one drive connected to your SCSI host adapter: Except for your boot-partition, all partitions should be marked "non-bootable" by assigning them a boot-priority of minus 128. It usually does not make sense to have more than one boot-partition anyway; your boot-partition should have a boot-priority of 0. Otherwise, the system might accidentally boot off a partition not considered bootable if it is located on a drive that requires less time

to become ready than your boot-drive. Boot-priorities should be no higher than 4, since otherwise this would override the internal floppy disk drive, and—under 1.3—one would no longer be able to boot off a Workbench diskette, for example, in case of an emergency.

Mem: This indicates what type of memory the buffers are to be allocated from. F- Fast memory, C- Chip memory, or E- either chip or fast. The default setting for this is E for either type of memory. This allows the system to choose which is optimum at run time. Do not choose Fast memory unless your system will always have Fast memory in it.

Buffers: This is the amount of memory, in kilobytes, that the system will allocate for the buffers used in transferring data to and from the hard drive. This number should be entered in decimal, not hex.

Mask: This value specifies the Address Mask, which indicates the memory range that DMA transfers can use. This value should be entered in hex form **and must be set to 0xFFFFF0** for drives used with the **030-Combo Board**.

Partition Name: This is the name that you choose to call your individual partitions.

To the right of the general drive information section are four gadgets. These gadgets include Disconnect/Reconnect, Synchronous, Last Disk, and Last LUN.

Disconnect/Reconnect: This option is useful for SCSI devices that have their own internal buffer. When this gadget is selected it allows the device to remove (or disconnect) itself from the SCSI bus while it writes from its own fast internal buffer to the slower media of the device. This then frees up the SCSI bus for other tasks. When the device is finished writing, and it needs to access the SCSI bus, it then joins (or reconnects) itself to the SCSI bus in order to finish its task. While this is a desirable feature, many devices do not support it and it should normally be left off.

Synchronous: This option allows a hard drive to request a synchronous transfer of data. In some cases this makes for faster data transfers. Currently this is not implemented.

Last Disk: This gadget, when checked, tells the controller that the particular device in question is the last device on the SCSI chain. What this means is that the controller will not go looking for devices beyond

this one when booting and will stop at this last disk. Consequently this will speed up boot times since the system does not have to seek SCSI IDs with no associated device. Keep in mind that if you add additional devices after the specified last disk then you must change this setting because the system will ignore any device after the Last Disk. No longer used by the GVP SCSI driver. (See "gvpscsi.device and boot-priorities" from previous page.)

Last LUN: Each SCSI ID, as defined by the standard, is allowed to have eight logical subdivisions called Logical Unit Numbers (LUN). This is most common in SCSI devices that have only one on-board interface running several devices (e.g. two drive Bernoulli Box from IOmega). Enabling this option makes the boot process slightly faster and should only be turned off with drives that have multiple LUNs attached

Near the top of the screen are the Dos Format, Read, and Write gadgets. These gadget functions are as follows:

Dos Format: Used to execute a standard Amiga DOS format. This will completely erase all current data on the drive.

Read: This will read the RDB mountlist information from the drive. This is useful when you have changed some data on the screen and wish to regain your original parameters. By clicking on the Read gadget, FaaastPrep™ will display the current parameters, as stated in the RDB mountlist, for the drive.

Write: This will write the information displayed on the screen to the RDB mountlist of the drive. Changing parameters such as size and cylinder values will destroy all data in those partitions. All other parameters relating to the partition will not destroy data if they are altered.

On the menu bar is a menu titled "Select". This will allow you to either quit or jump to the main screen. It also allows you to create a copy of your RDB in a mountlist format in RAM and generate a boot floppy for users who have V1.2 Kickstart.

Note: Hard Disk Drive Performance

It may be possible that SCSI drives already "prepped" with other controllers may have limits set on the memory range they can directly address. This can have an adverse affect on the hard drive transfer rates since all data from such a drive has to be buffered through the 1 megabyte of RAM on the Amiga motherboard. For the fastest possible drive speeds, a SCSI drive

USING THE PC BRIDGEBOARD WITH A GVP HARD DISK

should be connected to the Series II board and have access to the full address range of system and extended memory. To ensure that the maximum SCSI performance is achieved with the built in controller of the 030-Combo Board, it is very important that the "DMA Mask" in the RDB on the hard drive is correctly set.

This is a hexadecimal number which when translated into binary makes a list of address bits than can be used. The default value for most existing DMA controllers is only six characters long. This is enough to access all of the standard Amiga memory, but not the extended memory. With a drive attached to the combo board SCSI interface, the mask must be changed to 0xFFFFFFFF which will allow the controller to transfer data to all the standard Amiga memory AND the extended memory on the combo board.

There are two methods for setting DMA mask for your previously prepared and formatted hard disk drives. The first is a simple command line utility called SCSIMaskFix. The program has instructions built into it and can be displayed by typing, "gvp.install:gvputils/scsimaskfix ?" from a shell. The GVP Faaastprep program can also change the mask value and runs under Workbench. To set the mask to 0xFFFFFFFF, double click on the Faaastprep icon. Select the manual installation option on the opening screen. Next, use the arrows or type in the ID gadget to select the drive you want to change. The screen should display the partitioning information for the drive. Click on the first character in the Mask block and delete the string. Now type in 0xFFFFFFFF and repeat this for each partition on the drive. Once this is complete, click on the Write button to save the changes to the drive. This will not erase the data on your drive as long as nothing else is changed. It will only change the boot information for that drive.

The GVP 030-Combo Board's SCSI controller boards support Commodore's A2088 and A2286 Bridgeboards by providing a convenient way to create **virtual drives** for the PC side to access. The term **virtual drive** refers to the process by which an AmigaDOS file is created on the Amiga side to act as a separate hard drive for the PC side. In this way, a GVP-controlled SCSI hard drive offers you fast, effective storage for both your Amiga and your PC applications.

There are presently two versions of the Commodore's PC Bridgeboard "Janus Software," the essential installation software accompanying your Bridgeboard. In this section of our manual, GVP has attempted to clear up the confusion that formerly surrounded this process. **Please check your Janus software to determine whether it is Version 1 or Version 2**, and follow the corresponding procedure for the rapid creation of your virtual drive, in either Chapter 10 or 11.

NOTE: The following assumes that you have:

- successfully completed the hardware installation of the Bridgeboard by following the instructions in its manual.
- successfully completed the hardware installation of your GVP 030-combo Board/drive assembly—please refer to the previous chapters.
- successfully set aside a formatted AmigaDOS partition of your hard drive that will contain the PC virtual drive file. Follow the instructions for software installation in Chapter 8. We recommend that the size of this allocated partition be between 5 and 20 megabytes, depending on how much of your hard drive space you are willing to allocate to your PC side. (Please note also that the MS-DOS limit is 32 megabytes).

INSTALLING THE JANUS SOFTWARE VERSION I

Step 1:

Insert the GVP Installation diskette in your floppy drive and double click on its icon. Next, run GVP's Bridgeboard Install utility by double clicking on the BBI icon. Follow the instructions prompted by the BBI utility. When BBI is finished, proceed to the next step.

Step 2:

The next step involves adding a single line to the "startup-sequence" file in the "s" directory so that the virtual drive information is fed to the Amiga side upon boot-up. This command line may already be present in your "startup-sequence", so you must check carefully as we proceed. Type

```
ed sys:s/startup-sequence
```

to enter into the startup-sequence file. Cursor down through the various lines to find a line that reads, **Binddrivers**. If **Binddrivers** is *not* present, you should add it about 7-10 lines from the top (from the bottom if you have an accelerator card installed) by typing a single RETURN at the end of the line you wish **Binddrivers** to follow, and then typing **Binddrivers** into the newly-created empty line. (Refer to the AmigaDOS manual for instructions regarding ED.)

Next, place the cursor after the **Binddrivers** command and press the return key to insert a new line after it. Now type into the empty line the following:

```
run >nil: sys:pc/pcdisk.
```

This routine allows the Bridgeboard to read and write Amiga drive information. To exit, again hit **ESC**, and then **X**, and then RETURN to save the modified startup-sequence. (Note: If you enter a **Q** instead of an **X** all your edits will be lost and you will be able to start again.)

Step 3:

Place the MS-DOS System Disk #1 in the 5.25" IBM drive. Reboot your computer (CTRL-AMIGA-AMIGA). Open the PC color or PC mono window

— depending on what jumper settings you have selected by consulting your Bridgeboard manual.

Step 4:

Always make backups! You can make a backup of the 5.25" MS-DOS disk by typing "**diskcopy a: a:**" at the "A>" prompt. **NOTE: The quotation marks used throughout this section are only for your reference; they are not to be typed.**

Step 5:

Store the original MS-DOS diskette in a safe place, and make sure its COPY is in the 5.25" drive. This is your MS-DOS boot disk, and you will now modify it to facilitate the use of a virtual drive. Still within the PC window, type the following at the "A>" prompt being careful to use the correct backslash key.

```
Copy con a:\config.sys
```

On the screen, you will receive a new line without a prompt, at which point you should type the following lines of text exactly as they are shown below. The comment column separated with semicolons is just for your reference and is NOT to be entered. After each separate line, press the RETURN key.

YOU TYPE	:	COMMENT
files = 20	:	Maximum number of open files
buffers = 20	:	Reserved memory for drive speed
device = jdisk.sys	:	Loads PC-Amiga translator
device = ansi.sys	:	Loads common graphics driver
^Z	:	End of this file. * See next page *

* The “^Z” or so-called “**control Z**” character is obtained by holding the control (CTRL) key down and pressing the Z key at the same time. After this last line is typed and the RETURN key is pressed, the computer will give you a confirmation message, and your prompt should return to the screen.

Step 6:

Reboot the Bridgeboard by pressing the keys CTRL, ALT, and DEL simultaneously. Once the “A>” prompt has returned, you are ready to create the virtual drive. Before you enter the appropriate command, you must first determine four things:

1. **MS-DOS virtual drive letter**— (C,D,E, or F) by choice
2. **AmigaDOS drive number**— partition set aside (i.e.dh1,dh2...)
3. **AmigaDOS filename**— by choice (i.e. pcdrive, mydisk, etc.)
4. **Virtual drive size**— in kilobytes (i.e. 15meg=15000)

Our example drive created below uses the first example selection from each of the four given options above. You will now enter the following line while substituting your own names and numbers in place of the example selections in bold:

```
jlink c: dh1:pcdrive /c:15000
```

Be certain that you have pressed RETURN after this line, and **be aware that if you are recreating an already established virtual drive that all of the MS-DOS data will be erased.**

Step 7:

Transfer the contents of the 5.25" floppy diskette to the newly-created virtual drive by entering:

```
copy a:.* c:
```

Step 8:

Now you need to make a boot file on the same floppy that will serve to automatically activate the virtual drive and transfer control to it after each startup. Please type

Copy con a:\autoexec.bat

and hit RETURN. Next, enter the following lines without typing the semi-colored comments which are again provided only for your information.

YOU TYPE	COMMENT
echo off	; limits output to the screen
cls	; clears the screen
jlink c: dh1:pcdrive	; re-links virtual drive *see below*
set comspec=c:\command.com	; DOS to virtual drive
path=c:\	; sets path to virtual
c:	; defaults to the c drive
^Z	; ends the file, like

Step 9:

You have now completed your virtual drive installation. * In the above example, MS-DOS drive “c” is the virtual hard drive contained on a file called **dh1:pcdrive** of the Amiga side; you should use the appropriate drive names and filename when you enter this line. **NOTE: There are certain precautions that you should always follow to insure the future proper operation of your virtual hard drive:**

1. **Always UNLINK** the drive before rebooting or turning off your computer by typing “**jlink c: /u**” where “c” is the drive letter.
2. **As an added security**, before you use the virtual drive for your applications, fill it completely with any data and/or files, unlink it, then re-link it and delete this data. This procedure expands the virtual drive before you place valuable data on it, and an accidental reset is much less likely to damage your information later on.

INSTALLING THE JANUS SOFTWARE VERSION II

Step 1:

Insert the GVP Installation diskette in your floppy drive and double click on its icon. Next, run GVP's Bridgeboard Install utility by double clicking on the BBI icon. Follow the instructions prompted by the BBI utility. When BBI is finished, proceed to the next step.

Step 2:

The next step involves adding a single line to the "startup-sequence" file in the "s" directory so that the virtual drive information is fed to the Amiga side upon boot-up. This command line may already be present in your "startup-sequence", so you must check carefully as we proceed. Type

ed sys:s/startup-sequence

to enter into the startup-sequence file. Cursor down through the various lines to find a line that reads, **Binddrivers**. If **Binddrivers** is *not* present, you should add it about 7-10 lines from the top (from the bottom if you have an accelerator card installed) by typing a single RETURN at the end of the line you wish **Binddrivers** to follow, and then typing **Binddrivers** into the newly-created empty line. (Refer to the AmigaDOS manual for instructions regarding ED.)

Next, place the cursor after the **Binddrivers** command and press the return key to insert a new line after it. Now type into the empty line the following:

run >nl: sys:pc/pcdisk.

This routine allows the Bridgeboard to read and write Amiga drive information. To exit, again hit **ESC**, and then **X**, and then RETURN to save the modified startup-sequence. (Note: If you enter a **Q** instead of an **X** all your edits will be lost and you will be able to start again.)

Step 3:

We will now format the virtual drive and copy the contents of the MS-DOS floppy disks over to it. Insert the MS-DOS system disk number 1 into the 5.25" drive and reboot the Amiga (CTRL-AMIGA-AMIGA). Open the appropriate color or mono window from the PC drawer. At the "**A>**" prompt, type "**FDISK**" and hit RETURN. You will be presented with an option menu. Select option #1 to create a DOS drive partition. Next choose option #1 again to create a *primary* DOS partition. Next, designate an *active* partition as the number 1 partition. When this has finished, hit the escape key to exit, and then reboot the Bridgeboard side with (CTRL-ALT-DEL). Some versions of the A2088 board might "hang" the system, in which case you should use the "PCHard" icon to reset it.

Step 4:

At the new "**A>**" prompt, you will format the virtual drive by typing, "**format c: /s**", being careful to use the proper slash key. When that finishes, type "**xcopy a: c: /s**" to copy the first system disk to the virtual drive. When the copy is complete, type "**C:**" to make the virtual drive the current directory. Place the second MS-DOS disk into the 5.25" floppy drive, and retype "**xcopy a: c: /s**" to copy the contents of the second floppy to the virtual drive. Repeat this process once more with the third MS-DOS system disk. You have now completed the installation. You may test your work by removing the 5.25" floppy and rebooting the Bridgeboard side. Now, watch your GVP-controlled hard drive autoboot as a virtual MS-DOS drive!

In this chapter, we will explain some of the more technical details related to GVP's SCSI software which are useful to know if you want to program the SCSI driver or if you want to improve the performance even further. Some sections (and the example programs on the distribution disk) assume some familiarity with the Amiga's I/O system, especially the way the trackdisk.device works. For an introduction, see [3, Chapter 19 and Chapter 42].

Initialization

The GVP device driver must be opened via the `exec.library's OpenDevice()` call. It requires a standard I/O request, the "flags" parameter must currently be set to zero. Here is an example:

```

struct MsgPort *mp;
struct IOStdReq *io;

if((mp = CreatePort(NULL, 0)) != NULL)
{
  if((io = CreateStdIO(mp)) != NULL)
  {
    if(OpenDevice("gvpscsi.device", UNIT, io, 0) == 0)
    {
      /* SCSI commands go HERE */

      CloseDevice(io);
    }
    DeleteStdIO(io);
  }
  DeletePort(mp);
}

```

GVP's SCSI driver adheres to the standard defined in the include file `<devices/scsidisk.h>`, so the unit number has the following meaning: The 100s digit is the board number (our driver supports any number of boards), the 10s digit is the logical unit number (LUN), and the 1s digit is the SCSI target ID. The host adapter itself currently uses target ID 7 (HFERR_SelfUnit on `OpenDevice()`), but this is subject to change. For

further information, see [2, pages D-16 and D-17] and [2, pages E-17 and E-18]. The driver automatically recognizes all GVP SCSI controller boards in the system.

Trackdisk Commands

GVP's SCSI driver supports the following trackdisk.device commands (see [2, pages B-70 to B-76] for the official documentation on the trackdisk.device and [2, pages D-19 and D-20] and [2, pages E-20 and E-21] for the corresponding include file definitions):

```

CMD_READ
CMD_WRITE
TD_FORMAT
TD_MOTOR
TD_SEEK
CMD_UPDATE
CMD_CLEAR
TD_REMOVE
TD_CHANGENUM
TD_CHANGESTATE
TD_PROTSTATUS
TD_ADDCHANGEINT
TD_REMCHANGEINT

```

`gvpscsi.device` will automatically support *any* block size up to 64 kilobytes that is a power of two, so the `io_Length` and `io_Offset` parameters for the `CMD_READ`, `CMD_WRITE` and `TD_FORMAT` commands do not necessarily have to be multiples of `TD_SECTOR` (512) bytes, even though the 1.3 file systems (ROM and FFS) do not support other block sizes. It is possible, however, to use SCSI devices with a block size *smaller* than 512 bytes (e.g. 20-meg Iomega Bernoulli with 256-bytes sectors), since our SCSI driver will handle requests of any size as long as it is a multiple of the current logical block size as understood by the SCSI drive. This is also the reason our new driver does not require the `MountList MaxTransfer` kludge as most other drivers do (i.e. `MaxTransfer` is `0x7FFFFFFF`). This results in much faster transfer of large data blocks.

In contrast to trackdisk.device V1.3 or earlier, `TD_REMCHANGEINT` *does work!* Use of `TD_REMOVE` is not recommended, since this might interfere with the file system. The current versions of the Amiga file

systems do not make use of the TD_ADD/REMCHANGEINT calls, since many drivers do not support them or simply crash. Therefore you should not use more than one partition on any removable medium!

Always make sure the motor is turned off using TD_MOTOR after CMD_READ, CMD_WRITE or TD_FORMAT, since otherwise you might not be able to eject removable media cartridges (e.g. SyQuest).

Direct SCSI Commands

The Commodore SCSI standard provides for a way of sending raw SCSI commands that do not fit into the Amiga's I/O system to the device. This way, a programmer can use any command supported by the SCSI device's firmware. Here's an example on how this feature can be used:

```
struct IOStdReq *io;  
struct SCSCmd SC;  
UBYTE command[12];
```

```
io->io_Command    = HD_SCSCMD;  
io->io_Length     = sizeof(struct SCSCmd);  
io->io_Data       = (APTR)&SC;
```

```
SC.scsi_Data      = (UWORD *)scsidata;  
SC.scsi_Length   = scsilength;  
SC.scsi_Command = command;  
SC.scsi_CmdLength = 6;  
SC.scsi_Flags    = SCSIF_READ | SCSIF_AUTOSENSE;  
SC.scsi_SenseData = sensedata;  
SC.scsi_SenseLength = MAXSENSE;  
SC.scsi_SenseActual = 0;
```

```
command[0] = scsicmd;  
command[1] = LUN << 5;  
command[2] = 0;  
command[3] = 0;  
command[4] = scsilength;  
command[5] = 0;
```

```
DoIO(io);
```

```
/* ... */
```

HD_SCSCMD is the name of the Exec command being used, io_Length is always set to sizeof(struct SCSCmd), io_Data points to the SCSCmd structure. The SCSCmd structure in turn points to the memory area for the SCSI data and the Request Sense data. It also contains fields for data length and SCSI status information.

For a complete example on HD_SCSCMD, see the distribution disk. Make sure you also read and understand the section "Memory Requirements". One more restriction: Don't use HD_SCSCMD to perform block I/O on disk devices, use the trackdisk commands (CMD_READ, CMD_WRITE) instead!

The SCSIF_AUTOSENSE feature requires the use of the latest version of <devices/scsidisk.h>, which is, unfortunately, not included with the Version 5.05 of the Lattice C compiler. It can, however, be obtained from Commodore Applications and Technical Support (CATS) as part of the Native Developer Update Kit 1.3.

Memory Requirements

There are certain restrictions on the memory regions that can be used when dealing with SCSI DMA controllers. These restrictions do not necessarily apply to the GVP SCSI controller boards and/or drivers, they should, however, be taken into account when writing software that is supposed to work with other manufacturer's SCSI controllers.

Memory regions used for DMA should be at least word-aligned, some controllers (none of GVP's though) even require longword-alignment. This is easily achieved with the AllocMem() call. The other requirement is related to the type of memory used: Since most SCSI controllers are Zorro-II devices (i.e. designed for the A2000 with its 24-bit address bus), they can only DMA into the lower 16 megabytes of the Amiga's address space. If you happen to have a RAM expansion board that is located outside the address range \$00000000 to \$00FFFFFF or one that does not support DMA, you must restrict all SCSI data transfers to those regions of memory that do support DMA. In the worst case, this is Chip memory only, so you should allocate data buffers with the MEMF_CHIP attribute and set the MountList Mask-parameter to 0x1 FFFFF (Chip memory only). Unfortunately, there is no way a programmer can request Zorro-II memory without traversing the free-memory list. None of these restrictions apply to the GVP Impact Series I SCSI controllers, and usually it is sufficient to

use a Mask value of 0xFFFFFE. Please refer to your RAM expansion manual for further information.

Summary: For CMD_READ, CMD_WRITE and TD_FORMAT, io_Data should be at least word-aligned and point to DMA-able memory. io_Length should be an even number of bytes. For HD_SCSCICMD the same restrictions apply to scsi_Data, scsi_SenseData, scsi_Length and scsi_SenseLength. scsi_Length should not exceed the 24-bit limit.

MountList and the Rigid Disk Block

GVP's SCSI software adheres completely to Commodore's Rigid Disk Block standard. This allows automounting/autobooting with alternate file systems (non-ROM file systems). We also support the FileSystem.resource and file system version numbers, so the SCSI driver will automatically use a later ROM file system if one is available. This enables you to use the Kickstart 2.0 ROM file system and all of its new features, even though the drive might have been prepped with the 1.3 FFS. It also requires much less memory.

One other advantage of the RDB standard is that you can move hard drives and cartridges between different manufacturers' controllers and boot from them without having to re-prepare anything.

VUPrep

The RDB standard is defined in [2, pages D-5 and D-6], [2, pages E-6 and E-7], and [3, pages 538-545].

GVP SCSI the MMU and V. 2.0

Version 3.0 or later of our SCSI device driver no longer requires a SetCPU CARDROM entry, since the driver will copy itself to 32-bit memory (if any is available) and therefore execute at the highest possible speed. Since SetCPU requires large memory blocks, this will save valuable 32-bit memory and leave the MMU available for other tricks.

Removable Media

gvpscsi.device fully supports removable media (e.g. SyQuest, Iomega Bernoulli, Ricoh) by implementing the trackdisk commands TD_REMOVE, TD_ADDCHANGEINT and TD_REMCHANGEINT. The 1.3.2 Fast File System, however, does not make use of them, so you would really have to use

the old ROM file system if you wanted to use removable media. Since this is not an acceptable solution, our SCSI driver uses some special tricks to tell the FFS about media changes. One drawback, however, still applies: Workbench icons might change to "BAD" instead of disappearing after you remove a cartridge.

Gvp\$scsiCtrl is a small utility that can be used to mount removable media that have not been inserted at boot-time. See Chapter 14 for details.

Disconnect

Version 3 of the GVP SCSI device driver automatically enables all SCSI devices to "disconnect" if more than one is connected. This means that if a SCSI device detects that an operation might take longer than usual (due to seeks etc.), it will release the SCSI bus and give other SCSI devices a chance to operate. Imagine an Amiga with a hard drive and a tape unit: Without the disconnect feature, every time your backup-software would rewind the tape, you could do absolutely nothing with your hard drive until the operation was complete! The same applies for example to low-level formatting of hard drives, which usually takes a few minutes. Under gvpscsi.device, the SCSI will send the driver a message that it is releasing the bus and yet another message when the low-level format is done. Between these two messages, all other SCSI devices can operate normally, they could even disconnect as well. This is similar to the Amiga's multitasking ability where one task releases the processor (i.e. "goes to sleep") until an external event takes place, thereby giving other tasks a chance to run.

The disconnect feature has a slightly higher per-command overhead than the "nasty" mode which "holds" the SCSI bus until the command is completed. With the GVP Impact Series I SCSI controllers, writing very large blocks of data can also be slightly slower in disconnect-mode. If you do not normally operate with several SCSI devices at the same time, you might wish to disable the Disconnect/Reselect feature. If you only have a single SCSI device connected, the driver will use the nasty mode by default.

SWITCHING BETWEEN 68000 AND 68030 CPU MODES

References:

[1] American National Standard for Information Systems - Small Computer System Interface (SCSI), ANSI X3.131-1986, American National Standards Institute, Inc.

[2] Commodore-Amiga, Inc.: Amiga ROM Kernel Reference Manual: Includes & Autodocs, 1989, ISBN 0-201-18177-0, Addison-Wesley Publishing Company, Inc.

[3] Commodore-Amiga, Inc.: Amiga ROM Kernel Reference Manual: Libraries & Devices, 1989, ISBN 0-201-18187-8, Addison-Wesley Publishing Company, Inc.

Switching to 68000 mode

Even though the Amiga's operating system has been designed to support not just the standard 68000 microprocessor, but also its successors, like the 68020 and 68030, quite a few programs—mostly games and copy-protected software—will not run properly on an accelerated Amiga. Some of them will run way too fast, others will not even boot. Note that software which will not work correctly with the 68030 CPU on your 030-Combo Board, will also NOT work on the Amiga 3000.

To overcome this problem, your 030-Combo Board can be switched back to normal 68000 mode.

There are three different ways of switching back to 68000 mode:

- Jumper J6

Shorting this jumper enables the original 68000 processor on the A2000's motherboard; removing it will re-enable the 68030 processor. Changing the state of the jumper while the Amiga is up and running will certainly cause a system-crash, so make sure the Amiga is powered down before switching between modes, using jumper J6.

- boot68000 utility:

Your 030-Combo Board can be switched to 68000 mode by means of a small utility program. This program, boot68000, strobes a special register that is part of the accelerator board and then reboots the machine by software. The boot68000 utility can be activated in two different ways. These are:

- *Double-click on the boot68000 icon.*
The boot68000 utility is contained in the root directory of the Faaastprep disk. Copy it to your hard disk (if you have one) so that you can reboot your system into 68000 CPU mode at anytime, by simply double-clicking on the boot68000 icon.
- *Holding down left mouse button when system is re-booted.*
By including the boot68000 utility in your startup-sequence in the way described below, you can select the 68000 mode each time you boot your system by simply holding down the left mouse button

during rebooting. When including the boot68000 utility in your startup-sequence, it must only be executed when the left mouse button is being held down. This is done with the aid of the QMouse utility from Fish Disk 49. The QMouse utility is also included on the Faaastprep installation disk for your convenience.

Using the QMouse utility it is possible to query the left mouse button and if it is pressed-reboot to 68000 mode. This is similar to the way older accelerator boards (from Commodore or GVP) used a special set of "Boot ROMs" to allow this mode switching. Below is an example of how the beginning of your S:Startup-Sequence might look to allow you to select 68000 mode by holding down the left mouse button when you boot your system:

```
QMouse
if WARN
  FailAt 11
  boot68000
  FailAt 10
Endif
```

Rebooting the system with CTRL- Amiga-Amiga will take you back to 68030 mode.

In 68000 mode, it is not possible to use any of the devices on the accelerator board: 32-bit-wide RAM and the SCSI controller will disappear completely! When switching to 68000 mode by means of boot68000, all volatile data in the system will be lost, including all KickTags and therefore also the recoverable RAM-disk "RAD." Note that this may seem strange but bear in mind that this is still better than an A3000 which can never be switched back to 68000 mode!

REMOVABLE MEDIA AND USING THE GVPSCSICTRL UTILITY

The GVP FaaastPrep disk contains a CLI utility to control certain useful functions of the GVP SCSI driver.

GvpScsiCtrl and its options

GvpScsiCtrl (to be found in the drawer GvpUtils on GVP's installation disk) can be used to perform some special operations related to the SCSI driver.

- **GvpScsiCtrl -m**

...without any options will scan all drives that are currently recognized by the SCSI driver and will try to mount all of the partitions (if this has not yet been done). It will return control to the CLI after it has finished this attempt, no matter if it has been successful or not. This is useful if you have booted a system with an empty removable-medium device and want to insert the cartridge later.

- **Run >NIL: GvpScsiCtrl -s**

...will do the same as above, but if it does not succeed in mounting a particular unit (e.g. because there is no cartridge inserted), it will wait until the user actually inserts a cartridge (this is also the default behavior when GvpScsiCtrl is started from Workbench). This option is usually used by Workbench users in their S:Startup-Sequence to make the removable-medium icon show up automatically the first time they insert a cartridge. The program will terminate as soon as all units have been mounted successfully.

If GvpScsiCtrl has been started from the CLI and is currently waiting for a particular unit to become ready, it can be aborted by typing CTRL-C or — if it has been Run in the background—with the CLI-command "Break." Use status to find out the process-ID of GvpScsiCtrl and then issue a Break command with this particular ID to terminate the execution.

- **GvpScsiCtrl -r**

...is used in conjunction with the new V3.8 (or later) SCSI autoboot-algorithm to rescan the SCSI bus for target devices that did not respond fast enough or that have not been connected (or powered-on) at autoboot-

time. Since the GVP SCSI driver does not wait for slow devices to get ready if it has already recognized a bootable partition, this command should be inserted somewhere into your S:Startup-Sequence, so slow SCSI targets get a few more seconds to "wake-up". This command can be issued at any time, it will also mount all partitions. Remember that having SCSI targets that are not currently powered-on connected to the SCSI might adversely affect the reliability of other SCSI devices connected!

- **GvpScsiCtrl <unit> DCOFF**

Under certain circumstances (certain badly designed SCSI devices), the SCSI bus may not operate properly with disconnect enabled. The usual symptoms are that the Amiga will issue "phase error" warnings or simple "hang" during a SCSI operation. But take care: The same symptoms show up if the SCSI bus has not been terminated correctly, wrong cabling is used, or if jumpers on the SCSI host adapter board or on the SCSI target has been set up improperly!

Even though hard disks can easily be prepped to automatically disable this feature, devices without an RDB (such as tape drives, for example) must be treated differently. Simply issue the above command replacing <unit> with the SCSI ID (unit number) of the device in question.

RDB and autobooting

The Rigid Disk Block (RDB) is a special set of blocks located on a hard drive's first cylinder. It contains information about the number of partitions, their respective sizes and certain other parameters. These blocks are created by so-called "Prep" programs (e.g. GVP's Faaastprep or Commodore's HDToolBox), similar to the MS-DOS FDISK utility.

Even though the RDB is protected by checksums, and the driver's auto-mounting code performs certain sanity checks before using the data, there is the remote chance of an RDB-corruption going undetected by the driver. Furthermore, since the RDB contains code to be executed during driver initialization (the fast filesystem), it might become impossible to start the machine without crashing instantly.

In these cases of catastrophic corruption of the RDB, it is necessary to be able to start the driver without automatically executing the code that is part of the RDB, since the driver must be running if the RDB is to be corrected. To do so, perform the following steps:

1. Disable your device driver by removing jumper J4.
2. Boot your system using a workbench disk that does **not** contain any of GVP's drivers in SYS:Expansion (such as a copy of the original Workbench disk that came with your Amiga).
3. Copy the gvp SCSI device driver from the FaaastPrep installation disk's Expansion drawer to the Expansion drawer of your temporary boot disk. Note that the TWO files gvp SCSI and gvp SCSI.info must be copied.
4. Use the Workbench menu item "Info" to change the tooltype "AUTO MOUNT=TRUE" to "AUTOMOUNT=FALSE" and save the new settings.
5. Boot off your modified Workbench disk.
6. Re-prepare your hard disk using Faaastprep.
7. Re-enable the driver ROM by re-installing jumper J4.
8. Reboot your Amiga and the system should be back to normal.

SUMMARY OF JUMPER SETTINGS

Jumper Settings for the 22 Mhz. 030-Combo

Jumper	Default	Description
J3	OPEN	Disables 68030 MMU when shorted.
J4	SHORTED	when no SCSI devices are connected. OPEN when SCSI drive is connected, to enable Autobooting.
J6	OPEN	Disables 68030 CPU and bootup in 68000 mode when shorted.
J7	SHORTED	Reserved. 68030 Cache control.
J8	OPEN	Reserved. Select offset of code in EPROM.
J9	SHORTED	Disable EPROM code when OPEN.
J10	OPEN	See RAM expansion tables in Chapter 3. All extended RAM when shorted.
J13	SHORTED	See RAM expansion tables in Chapter 3. Default is all Auto-Config RAM, 1MB SIMMs only.
J11	OPEN	Reserved
J12	SHORTED	Reserved
J14	OPEN	Reserved
J15	SHORTED	Reserved
J16	OPEN	Reserved
J17	SHORTED	Reserved
J18	SHORTED	Reserved
J19	SHORTED	Reserved
J20	OPEN	Reserved
J21	PINS 1 & 2	Reserved. Jumper on Pins 1 & 2 (bottom two pins).
J22	SHORTED	Reserved for future use.
CN6	—>>	LED connector for SCSI drive.
CN7	PINS 1 & 2	Reserved. Jumper on Pins 1 & 2 (top two pins).
CN8	PINS 1 & 2	Reserved. Jumper on Pins 1 & 2 (top two pins).

Jumper Settings for the 33 Mhz. 030-Combo

Jumper	Default	Description
J3	OPEN	Disables 68030 MMU when shorted.
J4	SHORTED	when no SCSI devices are connected. OPEN when SCSI drive is connected, to enable Autobooting.
J6	OPEN	Disables 68030 CPU and bootup in 68000 mode when shorted.
J7	SHORTED	Reserved. 68030 Cache control.
J8	OPEN	Reserved. Select offset of code in EPROM.
J9	SHORTED	Disable EPROM code when OPEN.
J10	OPEN	See RAM expansion tables in Chapter 3. Shorted is all extended RAM.
J13	SHORTED	See RAM expansion tables in Chapter 3. Default is 4MB or 8MB Auto-Config RAM.
J11	OPEN	Reserved
J12	SHORTED	Reserved
J14	SHORTED	Reserved
J15	SHORTED	Reserved
J16	SHORTED	Reserved
J17	SHORTED	Reserved
J18	SHORTED	Reserved
J19	SHORTED	Reserved
J20	SHORTED	Reserved
J21	PINS 1 & 2	Reserved. Jumper on Pins 1 & 2 (bottom two pins).
J22	SHORTED	Reserved for future use.
CN6	—>>	LED connector for SCSI drive.
CN7	PINS 1 & 2	Reserved. Jumper on Pins 1 & 2 (top two pins).
CN8	OPEN	Reserved

Jumper Settings for the 50 Mhz. 030-Combo

Jumper	Default	Description
--------	---------	-------------

TO BE PROVIDED

DEVELOPING SOFTWARE FOR THE 68030

Note: Some software may incorrectly identify the 68030 as a 68020. This will not affect performance or reliability in any way.

The 68030 CPU is upward compatible with the rest of the 68000 family of micro-processors. Commodore has published a set of guidelines for software developers to ensure that their code will function properly on an Amiga equipped with the 68020 or 68030 CPUs. When developing code for the 68030:

- *Do not use the upper 8 bits of 68000 addresses to store unrelated information. The 68030 CPU uses the full 32 bits of each address so that any code that improperly uses the upper 8 bits of an address register will almost certainly break when run on a 68030.*
- *Never write self-modifying code or run code on the CPU stack. The on-chip instruction cache of the 68030 prevents this kind of programming.*
- *Do not write timing dependent code based on the CPU speed. Since a 68030 will execute the same instructions in far less time than a standard 68000, relying on the CPU to provide timing delays will cause problems when run on a processor with a different speed. The Amiga's timing hardware and video banking synchronization are the proper tools to use when writing timing dependent code.*

Be sure to test any code written on a 68030 for 68000 compatibility. The 68030 allows instructions, word, and long-word data to lie across word boundaries; the 68000 will generate an exception if this is attempted, but the same program will run properly on a 68030. It is good practice to ensure that data is properly aligned because it also decreases system overhead since fewer memory fetches are required to process properly aligned data.

Most high-level language compilers and interpreters are designed with these guidelines in mind, including the Manx (Aztec) C Compiler, the Lattice C Compiler, the M2Sprint Modula-2 compiler from M2S Inc., and the A Rexx language interpreter from William S. Hawes.

APPENDIX A

PINOUTS OF SCSI CONNECTORS

EXTERNAL SCSI CONNECTOR PINOUT (DB-25) FEMALE

Pin	Name	Pin	Name
1	REQ	14	Ground
2	MSG	15	C/D
3	I/O	16	Ground
4	RST	17	ATN
5	ACK	18	Ground
6	BSY	19	SEL
7	Ground	20	DB(P)
8	DB(0)	21	DB(1)
9	Ground	22	DB(2)
10	DB(3)	23	DB(4)
11	DB(5)	24	Ground
12	DB(6)	25	TPWR
13	DB(7)		

INTERNAL SCSI CONNECTOR PINOUT

	Pin	Name
• 50 • 49	50	I/O
• 48 • 47	48	REQ
• 46 • 45	46	C/D
• 44 • 43	44	SEL
• 42 • 41	42	MSG
• 40 • 39	40	RST
• 38 • 37	38	ACK
• 36 • 35	36	BSY
• 34 • 33	34	NC
• 32 • 31	32	ATN
• 30 • 29	30	Ground
• 28 • 27	28	Ground
• 26 • 25	26	Not Used
• 24 • 23	24	Ground
• 22 • 21	22	Ground
• 20 • 19	20	Ground
• 18 • 17	18	DB(P)
• 16 • 15	16	DB(7)
• 14 • 13	14	DB(6)
• 12 • 11	12	DB(5)
• 10 • 9	10	DB(4)
• 8 • 7	8	DB(3)
• 6 • 5	6	DB(2)
• 4 • 3	4	DB(1)
• 2 • 1	2	DB(0)

All odd pins, except pin 25, are ground. Pin 25 is not used.

WARRANTY

For a period of one year from the date of purchase, Great Valley Products warrants to the original purchaser that the hardware shall be free from manufacturing defects.

This warranty is applicable only to the original purchaser who purchased the product directly from Great Valley Products or from an authorized dealer. This warranty shall be void if the unit has been subjected to improper or abnormal use, or if modified or dismantled in any way. If a defect occurs during the warranty period, the unit must be returned, postage paid, in original packaging, to the place of purchase, together with the sales receipt.

The Purchaser's sole and exclusive remedy in the event of defect is limited to the correction of the defect by adjustment, repair, replacement, or refund at Great Valley Products' election. Great Valley Products will in no event be liable for any direct, indirect, or consequential damages to any equipment used with any hardware or software sold by Great Valley Products.

Any software provided is sold or licenced "AS IS". The entire risk as to its quality, performance, or fitness for any particular purpose is assumed by the buyer. Should the software prove to be defective following purchase, the buyer assumes the entire cost of all necessary servicing, repair, or correction of any incidental or consequential damages.

Any statements made by Great Valley Products and its employees, including but not limited to, statement regarding capacity, suitability, or performance of the unit shall not be deemed a warranty or representation of Great Valley Products for any purpose, nor give rise to any liability or obligation of Great Valley Products.

FCC STATEMENT

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

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

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

Your house AC wall receptacle must be a three-pronged type (AC ground). If not, contact an electrician to install the proper receptacle. If a multi-connector box is used to connect the computer and peripherals to AC, the ground must be common to all units.

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



GREAT VALLEY PRODUCTS INC.

8 August 1991

Addendum for 68030 "Combo" Boards

1. Page 47 of the manual, item number 1, should read, "Disable your device driver by removing jumper J9."
2. Page 17. "Mounting the SCSI drive on the '030 board itself" Please note that the hard drive mounting adapter only supports the low profile, 1 inch high drives.

Addendum for 22MHz 68030 Boards

Based upon comments from our users, GVP has changed the supported RAM configurations of the 22MHz 68030 board. The new configurations allow 1, 2, 4, or 8MB of autoconfig memory depending upon the type of SIMMS used. The chart on page 9 of the manual should be replaced with the one below.

Total RAM	Configed RAM	Extended RAM	Quantity & Type of SIMMs	SIMM Location	Jumper Settings
1 MB 2 MB 4 MB	1 MB 2 MB 4 MB	0 MB 0 MB 0 MB	Surface Mounted 1 x SIMM32-1MB-60 3 x SIMM32-1MB-60	N/A CN11 CN11-13	J10-Open J13-Short
1 MB 5 MB 9 MB 13 MB	0 MB 0 MB 0 MB 0 MB	1 MB 5 MB 9 MB 13 MB	Surface Mounted 1 x SIMM32-4MB-60 2 x SIMM32-4MB-60 3 x SIMM32-4MB-60	N/A CN11 CN11-12 CN11-13	J10-Short J13-Open
9 MB 10 MB	8 MB 8 MB	1 MB 2 MB	2 x SIMM32-4MB-60 2 x SIMM32-4MB-60 1 x SIMM32-1MB-60	CN11-12 CN11-12 CN13	J10-Open J13-Open