

68030 Accelerator User's Guide

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Introduction to the GVP 68030

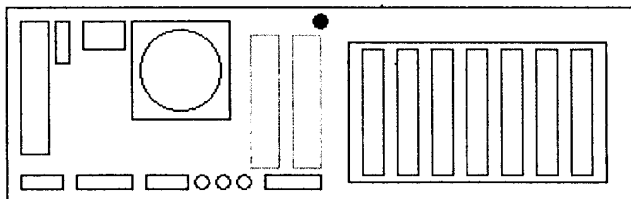
Dear Customer,

Congratulations on the purchase of your new GVP Impact 68030 accelerator board for the Amiga 2000. The GVP '030 board defines the current state-of-the-art in Amiga co-processor products, providing breath-taking performance without sacrificing compatibility. The GVP '030 board provides your Amiga with a high-performance Motorola 68030 micro-processor (and optional Motorola 68882 Floating Point Co-Processor), a fast AT/IDE auto-booting hard disk interface, and the ability to expand your Amiga's memory with high speed 'burst mode' 32-bit wide RAM to its full 8 megabyte capacity, all without using a *single* Amiga 'Zorro' expansion slot.

The GVP '030 board was designed to provide compatibility with a wide range of Amiga peripheral including GenLocks, audio and video digitizers, memory expansion boards, and hard disk controllers. Its unique asynchronous design eliminates the problems associated with conventional Amiga co-processor boards and makes it possible to run the 68030 processor at speeds ranging from 16mHz to 33.33mhz ~. An Amiga equipped with a GVP 68030 board performs some operations *ten times* faster than a standard Amiga and *over three times* faster than a 68020 equipped Amiga 2500.

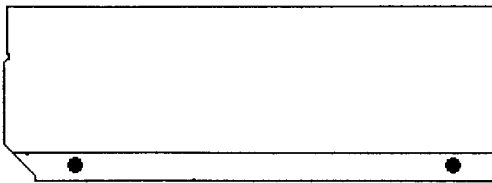
* Depending on the rating of the 68030 chip itself. Running the '030 board at higher than its rated speed will void your warranty and may cause hardware damage.

Many of the components inside your Amiga and on the GVP '030 board are sensitive to static electricity. When installing the GVP '030 board it is extremely important to work in a static free environment, always being careful to ground yourself against the Amiga's chassis before handling the '030 board itself. Have your dealer install the board for you if you are not comfortable working inside your computer.



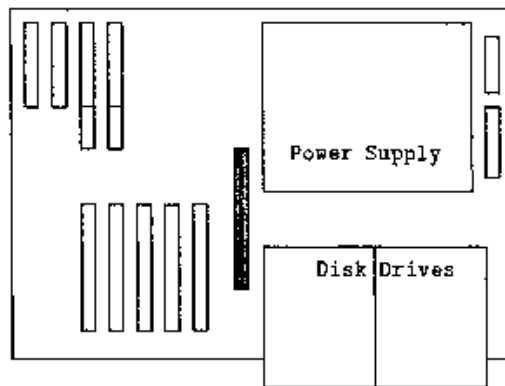
Amiga 2000, rear view

That warning aside, installing the GVP '030 board requires only a few simple tools and can easily be accomplished in 30 minutes. You will need a small Phillips head screwdriver and a pair of hands to install the board. 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. Remove these four screws and then orient the computer so you can see the back of the case. The fifth screw securing the case is located in the center of the back panel, near the top. Place the five screws where they aren't likely to be lost or dropped into the computer's open case. After removing the fifth screw, gently slide the Amiga's case forward (towards the front of the Amiga), then lift it off and put it somewhere close at hand.



Amiga 2000, side view

Now that you have the cover off, be sure to ground yourself by touching the exposed metal on the chassis. Locate the co-processor expansion slot on the motherboard, just to the left of the disk drives (see diagram). If there are any cables obstructing access to the coprocessor slot, 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, remove the cover plate, and save the screws. Remove the 68030 board from the protective antistatic plastic bag. Before inserting the board into the co-processor slot, check the jumper settings on the board against the defaults shown in the table on page 17. 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. Now attach the mounting bracket using the screws you removed from the cover plate. If you have purchased an optional high speed AT/IDE hard disk drive you should refer to chapter 2 *Installing an AT/IDE Hard Disk* before proceeding.



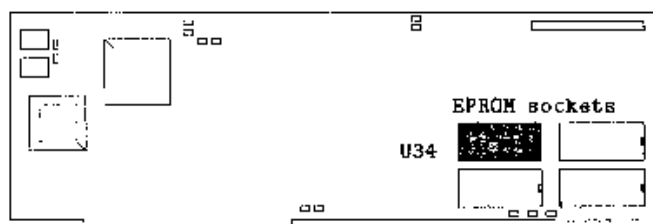
Amiga 2000 internal view

At this point the GVP '030 board is installed in the Amiga's coprocessor slot. 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 the small plastic LED holder is seated securely; it has four pegs that fit into holes on the front of the chassis. Once the case is over the top of the machine, loosely insert the five screws you removed in step one but don't tighten any of them until you are sure all the screws line up properly and the plastic LED holder is correctly seated and positioned in the A2000's front bezel.

Once the case has been tightened, make sure the power switch is in the off position and then re-connect the power cord. Now you're ready to boot the computer. Insert the GVP 68030 installation disk and turn on the power switch. If the board is installed properly the computer will boot normally. If the Amiga fails to boot turn the power off and turn to the *Trouble-Shooting* chapter.

Installing an AT/IDE Hard Disk

The AT/IDE (Integrated Drive Electronics) interface is a new standard for high performance hard disk interfacing. The AT/IDE hard disk interface built onto your GVP 68030 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. If you purchased the AT/IDE hard disk along with the 68030 board the auto-boot EPROM was installed for you by GVP or your dealer. If the auto-boot EPROM has not been installed you must install it at this time.



GVP Impact 68030 Board

installing the Auto-Boot EPROM

To install the auto-boot EPROM on the '030 board, locate the four EPROM sockets towards the rear of the board. Carefully insert the 030 EPROM into the upper left socket (U34). There will be a small notch on one side of the EPROM chip; a properly installed EPROM will have the notch facing to the rear of the board. Be very careful to install the EPROM in the correct orientation because an improperly installed EPROM will void your warranty and damage the EPROM chip. Refer to the above diagram when installing the EPROM, and note the small notch on the right of each EPROM. Your Amiga must be equipped with KickStart 1.3 to auto-boot. If your Amiga has KickStart 1.2 in ROM you should **not install the auto-boot EPROM**.

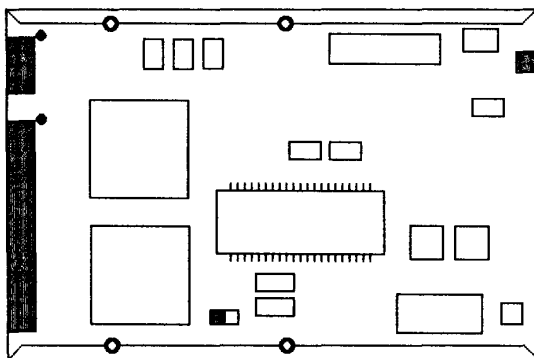
Once the EPROM has been installed, connect the 40-pin ribbon cable that was supplied with your AT/IDE hard disk to the 40-pin connector on the upper right corner of the 68030 board. Both ends of this ribbon cable have identical connectors and are keyed with a small plastic tab to prevent incorrect installation.

Installing the Hard Disk

Now its time to install the hard disk itself. You can mount the hard disk in the spare 3.5" drive bay (to the heft 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. If you have two internal floppy drives you will have to install the drive in the 5.25" bay; if you have a BridgeCard 5.25" drive installed you will have to mount the AT hard drive in the

3.5" bay. It may he necessary to remove one or more expansion boards from the Amiga to get access to the mounting screws. If you do not need to remove any expansion boards from the system, he sure to make note of any cables that are attached to the expansion boards so they can he reconnected properly.



Quantum AT Hard Disk

Mounting the AT drive in the 3.5" bay

If you are mounting the **AT drive in** the 3.5" hay, you will need to remove the metal plate that the floppy drive is mounted on; there are two screws on either side of the plate. After removing the mounting plate, attach the AT drive securely to the plate the connectors on the AT drive should he oriented the same way as the connectors for the floppy drive. There are two sets of mounting holes on the plate, choose the set that will set the AT 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 40 pin ribbon cable to the connector on the AT drive, and attach one of the spare 4 pin power connectors to the drive as well. Both the 40 pin ribbon cable connector and the 4 pin power connector are keyed to prevent incorrect insertion.

Mounting the AT drive in the 5.25" bay

If you are mounting the AT 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 AT drive and provide mounting holes so that, the drive can be secured to the computer's chassis. Attach the two mounting rails to the AT 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 40 pin ribbon cable to the drive, and then connect. one of the spare 4 pill power connectors to the drive.

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 and connect it to the LED connector on the front, of the hard disk. The black wire should connect to the **pin** closest to the edge of the drive. Note that the LED connector is on the *front* of the hard drive. Check to make sure all the cables are secure, replace the Amiga's cover*, and proceed with *Installing the AT/IDE Hard Disk Software*.

Installing a Second AT Hard Disk

It is possible to add a second AT hard disk to the *GVP 68030* board. To do this, you will need to obtain another AT hard disk and a daisy-chain ribbon cable with connections for two drives. To install a second AT hard disk, first remove the original 40-pin ribbon cable connecting the first drive to the 68030 board and replace it with the new cable, Now remove the juniper labeled DS from the new drive; this changes the drive's unit number from **0** to **1**. After mounting the new drive in the Amiga's case, connect the remaining 40-pin connector from the daisy-chain ribbon cable to the new drive and connect a 4-pin power connector to the drive as well. Replace the Amiga's case and re-boot the computer. Before you can use the second AT hard disk, you will need to format. and partition the drive. To do this you must open a CLI or Shell window and run the *GVPPrepAT* program.

* Refer to section one when replacing the Amiga's cover

Insert the GVP 68030 disk, change to the O30 scripts directory on that disk by typing the command `CD GVP 68030 scripts` and pressing return. Once you are in the O30 scripts directory type the command `GVPPrepAT 1 ASKALL`. The program will prompt you for the number of partitions to create on the new drive, the size (in megabytes of each partition, whether the partition should use the Fast Filing System, and the partition number of each partition. Be sure to choose a partition number that does not conflict with partitions that already exist on the first drive. The program will also give you the opportunity to change any of the default parameters for each partition; to accept the default values, just press return. Once you have run the GVPPrepAT program, re-boot your computer and format the new partitions using the Amiga DOS Format command. For example, to format partition DH2: with the volume name 'SecondAT' you would open a CLI or Shell window and enter the command `Format DRIVE DH2: NAME SecondAT FFS`.

To add an initial 4MB or 8MB of 32-bit RAM to the 68030 board you need to obtain a 32-bit memory board from GVP. The board will be pre-configured at the factory (or by your dealer) for the correct amount of memory on the board. To install the board, disconnect the Amiga's power cord, remove the case, unscrew the mounting bracket, and then gently pull the 68030 board out of the co-processor slot: you may need to disconnect the 40-pin ribbon cable that connects the 68030 board to an AT hard disk. Be sure to ground yourself against the Amiga's chassis before handling the 68030 board or the 32-bit RAM board.

There are two connectors along the left and top edges of the 32-bit RAM board that need to be connected to the 68030 board. In addition there are two plastic mounting pegs near the right edge of the board. Carefully mate the two connectors (being careful not to bend any pins) and then make sure the connectors are firmly pressed together. The two plastic mounting pegs will snap into place on the 68030 board. Once the two boards are mated together, re-insert the 68030 board into the co-processor socket, reattach the AT drive cable if necessary, reattach the mounting bracket, and replace the Amiga's cover. After installing the memory board you should boot the computer from the GVP 68030 disk and run the appropriate memory test program for your configuration to verify that the memory is functioning properly.

Adding Additional Memory

It is possible to upgrade a 4MB 32-bit memory board to 8MB 'in the field'. In order to add memory you must obtain four of the correct 80 ns 1MBx8 nibble mode SIMM's (Standard in-line Memory Module's). SIMMs designed for other computer systems (such as those for the PS/2 or Macintosh brands) are not suitable for use with the GVP 68030 board. The GVP 32-bit RAM board is designed to support the special 'burst fetch' mode of the 68030 and will not function properly if conventional memory modules are used. Nibble mode memory chips (like those used on the GVP 32-bit RAM board) are typically found only in high-powered workstations like the 68030 equipped NeXT machine and the Apollo work-stations favored by engineers. Once again, the memory chips on the SIMM modules are sensitive to static discharge so you should ground yourself against the computer's chassis before handling them.

Once the extra 4MB of SIMMs have been inserted in their special sockets, you will need to 'enable the extra memory by removing the shorting block from jumper J5 on the RAM board- do not confuse this with jumper J5 on the 68030 board itself. After installing the SIMMs, you should run the 8 meg test memory test from the GVP 68030 disk to verify that the memory is functioning properly.

Installing the AT/IDE Hard Disk Software

If you have not purchased an optional AT hard disk you should skip this section. Before you can use your new AT hard drive, you must format it and partition it. To get started quickly, insert the disk that came with the 68030 board and boot the computer. Once the WorkBench has been loaded, double-click over the GVP 68030 icon to open the disk, then double-click over the ATHDInstall icon to start the hard disk installation procedure.

After a few seconds, the hard disk installation program will open a window on the WorkBench screen. You will be asked to verify that you have installed the 68030 board and an AT hard disk. Type 'yes' or 'y' to continue. Answer 'yes' to the next question if you have installed the auto-boot EPROM on the 68030 board; if you have not installed the EPROM because your Amiga is equipped with the older version 1.2 KickStart ROM then you must answer *NO* to this question.

After confirming that you really wish to format the AT hard disk, the installation program will begin to format the hard disk.

Finally, the installation procedure gives you the opportunity to change your mind. If you have already formatted the AT hard disk and do not wish to destroy all of the data currently on the drive, answer *NO* to this question: the installation procedure will stop and return you to the WorkBench.

Once the installation program is complete, you should remove the installation disk from the floppy drive and re-boot the computer. The computer will boot from the AT hard disk instead of from a floppy disk.

After you have formatted and installed an AT hard disk using this installation procedure it is not necessary to install the 68030 software as detailed in the next section; the AT hard disk installation procedure automatically installs the 68030 software as part of the installation procedure so you can safely skip the *Installing the 68030 Software* section.

The GVP 68030 Installation disk provided with the 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. If you have installed an AT/IDE hard disk and its software you should skip this section. To install the 68030 software on your hard disk, boot your computer from your hard disk normally, insert the GVP 68030 installation disk into the floppy drive, and double-click on the GVP 68030 icon when it appears on the WorkBench. Once the GVP 68030 window is open, double click on the Install icon; this runs a short installation script that copies the necessary files to your hard drive and modifies your startup-sequence. When you re-boot your system from the hard drive, a special program called SetCPU will be run automatically which greatly enhances the performance of the 68030 board.

Please note that this installation procedure assumes that you have a hard disk that auto-boots with the Fast Filing System. The installation procedure installs the necessary programs on the logical disk volume SYS:. If you have a hard disk that requires a small boot partition (like the Commodore 2090A hard disk controller), refer to the next section.

Installing the 68030 Software on a Commodore 2090A

To install the 68030 software on a system equipped with a Commodore 2090A hard disk controller you will need to follow your regular boot procedure and then open a CLI or Shell window and type the command:

```
ASSIGN SYS: DHO:
```

Before inserting the GVP 68030 disk and starting the installation procedure. Once you have entered the above command you can chose the CLI window using the EndCLI command. After you complete the installation, the boot procedure will automatically run the 68030 software before transferring control to the main partition.

Installing the 68030 Software without Auto-Boot

If you have a hard disk that does not auto-boot or you do not have a hard disk, boot your computer from floppy from your regular WorkBench or boot disk and leave the boot floppy in the drive until you

complete the following command. Once the WorkBench has opened up, start up a CLI or Shell window and type the command:

```
ASSIGN SYS: DF0:
```

Before inserting the GVP 68030 disk and starting the installation procedure as detailed at the beginning of this section. After you complete the installation procedure, the 68030 software will automatically be run each the you boot from this floppy disk.

Jumpers and Options

The GVP 68030 board has a number of special jumpers and options that let you tailor the system to your particular needs. It is possible to add a 4MB or 8MB 32-bit memory board or to add an additional 4MB of memory to arm existing 4MB memory board. In addition, the 68031) board supports a variety of Floating Point Co-Processor options; the Motorola 68881 and 68882 FPU's (Floating Point Unit) are available in speeds from 16mHz to 25mHz (68881) and 16mHz to 50mHz (68882); the 68882 can perform calculations up to twice as fast as the older 68881 when clocked at the same speed, hut only a few Amiga software packages currently take advantage

of an FPU if it is present.

Floating Point Co-Processor

The floating point unit on the GVP 68030 board is commonly run at the same speed as the 68030 itself. The speed of the CPU (68030) and the FPU (68881/82) is determined by the rating of the crystal oscillator, which is contained **in** the rectangular metal can located in the Upper left corner of the board (U 1). This oscillator is socketed so it can be removed and replaced with an oscillator of a different speed. In addition, there is a socket for an optional *second* crystal oscillator for the FPU (U 2). The two Jumpers to tine right of these oscillator sockets (J4 and J5) control which oscillator tine FPU gets its clock speed from. To install an FPU that runs at the *same* speed as the 68030, it is only necessary to insert the FPU into tine socket, being careful not to bend any of the pins and to insert it in the correct orientation: The **arrow** on the **FPU must point in the opposite direction as the arrow on the 68030** chip itself. Refer to the diagram on page 5 and note that the FPU must be inserted upside down in relation to the 68030. Incorrect installation will destroy the FPU. If you wish to clock the FPU at a different speed than the speed of the 68030, you must obtain a standard 4 pin crystal oscillator rated for the correct speed and insert it into the second socket (U2). In addition, to enable the FPU's oscillator, von must remove the jumper on J5 and place it on J4. FPU's are available with speed ratings from 16mHz to 50mHz. It is possible to **put** a 50mHz FPU onto a board with a 25mhz 68030, a 25mHz FPU onto a board with a 16mHz 68030, or any other combination. Please be aware that, the expensive FPU chips (like all computer chips) are sensitive to static discharge, so you should always ground yourself against the computer's metal chassis before handling the chip.

The AT/IDE Hard Disk Interface

The auto-boot EPROMs for the AT interface should be installed in the upper two EPROM sockets on the 68030 board (U33 and U34); the current version of the hard disk driver requires only *one* EPHOM, which is installed into the first socket toward the front (left) of the card (U34). Older versions of the driver required two EPROMs: when installing a two-EPROM set, the *even* EPROM goes into tine socket on the left (U34) and the odd EPROM into the socket on the right. (U33). Please note that if your Amiga has a version 1.2 KickStart ROM you should *not* install the auto-boot EPROM on the board.

Disabling the 68030

In the unlikely event that you want to disable the 68030 board completely, place a shorting block across jumper J11 on the 68030 board. This disables the *entire* board, including the AT interface and the 32-bit memory. Some older software (notably games) will not run properly on a 68030 CPU. If you anticipate the need to switch between 68030 mode and 68000 mode frequently you may wish to mount a switch to the Amiga's rear panel and connect it to J11 with a short cable. This switch will enable you to change between 68000 and 68030 operation when required.

Other Jumpers

Most of tine other jumpers on the GVP 68030 board and the 32-bit RAM board are set at the factory and should not he changed. 'Fine J9 jumnpner oim the 68030 board is used to enable the 68030 boot EPROMs; the lower pair of EPROM sockets on the board are designed for future UNIX compatibility and are unused at this time.

The J10 jumper on the GVP 68030 is included for compatibility with some older 'A2000' Amiga motherboards. These 4-layer motherboards were manufactured by BSW in Germany, while the standard 2-layer A2000 motherboards were manufactured in West Chester PA. To use the 68030 board with one of these 4-layer boards it is also necessary to remove the 68000 CPU chip from the motherboard because the co-processor slot interface differs from the standard Amiga 2000 (also known as the 'B2000').

The J6 jumper can be used to disable the 68030's on-chip cache, and the J7 jumper can be used to disable the 68030's on-chip MMU (Memory Management Unit). These jumpers are provided only for testing purposes, since their functions can be duplicated with software. Finally, the J8 jumper on the 68030 board is provided for compatibility with Commodore's A2620 (68020) and A2630 (68030) coprocessor boards; the jumper is normally used to select the operating system to be used at boot time, either Unix or Amiga DOS, but its function can also be duplicated with the appropriate software.

Summary of 68030 Board Jumper Settings

Jumper	default	Description
J4	OPEN	Install to clock FPU from oscillator U2
J5	SHORTED	Remove to disconnect FPU from oscillator U1
J6	OPEN	Install to disable the 68030's caches
J7	OPEN	Install to disable the 68030's MMU
J8	OPEN	Install to enable Unix boot register
J9	SHORTED	Remove to enable 68030 boot EPROMs
J10	SHORTED	Remove for use in German 4-layer A2000's
J11	OPEN	Install to boot in 68000 mode
J12	OPEN	Reserved
J13	OPEN	Reserved
J14	SHORTED	Reserved
J15	OPEN	Reserved (AT interface)
J16	SHORTED	Reserved (AT interface)

Summary of 32-bit RAM Board Jumper Settings (4MB)

Jumper	Default	Description						
J1	OPEN	Reserved						
J2	OPEN	Reserved						
J3	SHORTED	Reserved						
J4	SHORTED	Reserved						
J5	SHORTED	Remove to	enable	full	8MB	of 32-bit	RAM	
J6	SHORTED	Reserved						
J7	OPEN	Reserved						

Theory of Operation

The Motorola 68030 is one of the most powerful single chip microprocessors available today. It contains two on-chip 256 byte caches; one for program instructions and one for data. The most frequently accessed memory locations are stored in these caches to significantly improve system performance by reducing the number of 'fetches' required from external memory. A special feature of the 68030 called 'burst fetch mode' allows the 68030 to fill the caches with consecutive memory locations very rapidly from memory that supports burst fetches. A 68030 equipped with burst mode memory can process information significantly faster than a 68030 equipped with conventional 32-bit memory. The GVP 68030 board is the only Amiga accelerator board that provides this additional performance boost. The 68030 also contains an on-chip MMU (Memory Management Unit) that allows you to re-map areas of the Amiga's address space and makes it possible for future versions of the operating system to support virtual memory and protected memory. The on-chip MMU supports a subset of the instructions and registers available on the older 68851 MMU.

The 68030 also has standard support for a co-processor interface that makes it possible to add external floating point units or memory management units. The GVP 68030 board has a socket designed to accept a 68881 or 68882 floating point unit which can be clocked independently of the 68030. The 68882 FPU is significantly faster than the older 68881 and is recommended for users with computation intensive tasks such as ray-tracing. GVP recommends only the newer 68882 FPU, which is available from GVP.

The GVP 68030 board is designed to automatically enable 'burst fetches' from 32-bit memory and to disable the caches when accessing the Amiga's CHIP memory (or graphics memory) or the address space on another expansion board. The caches are disabled for CHIP memory access because the Amiga's Blitter and Copper hardware can change the contents of this memory without the intervention of the 68030. When this happens, any of the modified memory that has been 'cached' by the 68030 will cause problems because the CPU has not been notified and updated the contents of the caches.

Developing Software for the 68030

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. The things to watch out for when developing code for the 68030 are:

- 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 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 dependant 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 which cause problems when run on a processor with a different speed. The Amiga's timing hardware and video blanking synchronization are the proper tools to use when writing timing dependant 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 ARexx language interpreter from William S. Hawes.

More About the Software

The GVP 68030 installation disk comes with several programs that control the 68030 and the AT hard disk. The SetCPU program lets you change the operating mode of the 68030, activate either or both memory caches, enable or disable burst memory fetches, and re-map the Amiga's 16-bit KickStart ROM into fast 32-bit memory to improve system performance. The GVPPrepAT program is used to create or change the partitioning information on an attached AT hard disk.

Using SetCPU

Complete documentation for the SetCPU program can be found in the file SetCPU.txt which is located in the Texts drawer on the GVP 68030 disk. Briefly, the SetCPU program accepts the following commonly used arguments: CACHE, BURST, DATA, INSTRUCION, and FASTROM. The command SetCPU CACHE BURST turns on the 68030's on-chip caches and enables 'burst fetch mode' from 32-bit memory.

The command SetCPU FASTROM causes SetCPU to set aside a portion (256K) of 32-bit RAM, copy the Amiga's 16-bit KickStart ROM into this memory area and re-map the address space (using the 68030's on-chip MMU) so that all references to the KickStart ROM are routed to 32-bit memory instead. Since nearly every Amiga program makes some use of the functions built into the KickStart ROM this command has the effect of speeding up almost every system operation.

SetCPU also has the ability to remap the auto-boot EPROMs on a hard disk controller board into 32-bit RAM, using the same technique. Several example CARDROM parameter files have been provided in the ROMList directory on the GVP 68030 disk; refer to the complete SetCPU documentation for details. Please note that while earlier versions of the AT driver would benefit from the CARDROM option, the latest (single EPROM) version automatically copies itself into 32-bit RAM without any help from SetCPU. Older versions of the AT driver and the auto-boot EPROMs on any of GVP's SCSI boards will give better performance when copied into 32-bit RAM using the CARDROM option of Set CPU

Using GVPPrepAT

The GVPPrepAT program is used to create or change the partitioning information stored on an AT hard disk. The syntax of the

GVPPrepAT program is:

```
GVPPrepAT < unit >< OFSIFFSIASKFSIASKALLIUNPREP>
```

The program requires two parameters; the drive unit number and a command. The first parameter must be a single digit, either 0 or 1; this is the unit number of the AT drive that will be prepped. The next parameter must be one of the command listed. When doing a custom installation, use the ASKALL command which lets you change any of the default partitioning parameters and specify the number of partitions to be created. To remove the partitioning information from a previously prepped drive, use the UNPREP command. For automated installation you can specify FFS which creates partitions that use the new (WorkBench 1.3) Fast Filing System; the OFS command tells the program to create partitions that use the older (Workbench 1.2) filing system. The ASKFS command will prompt the user for his choice of filing system to for each partition. Of the two standard filing systems, the Fast Filing System is recommended for all hard disk partitions.

Once a partition has been prepped you will still need to format it using the AmigaDOS Format command. Refer to your *Introduction to the Amiga 2000* manual and the AmigaDOS 1.3 Enhancer Manual for help using the Format command.

Trouble Shooting

So, you installed the 68030 board according to the instructions but it does not seem to be working properly. Don't panic! First, remove the Amiga's cover again and double check the following:

- The 68030 board should be inserted firmly in the co-processor slot, which is the first slot to the left of the power supply.
- If you have an AT hard disk, the AT auto-boot EPROM should be in the upper left EPROM socket (U34) and jumpers 315 and 316 should be set correctly. If you have an older (V1.2) KickStart ROM in your machine you cannot auto-boot from the AT drive so the EPROM *must* be removed. You can tell if you have an older KickStart version by looking at the WorkBench 'hand' that comes up after turning the power on. You can obtain a new (version 1.3) KickStart ROM from your dealer.
- For those with an AT hard disk, the 40-pin ribbon cable to the AT drive must be inserted firmly at both ends. Also be sure the AT drive has power connected to it via a 4-pin cable from the power supply.
- If you have an older German 'A2000' with a four-layer motherboard you must remove the 68000 CPU chip from the motherboard and pull jumper J10 from the 68030 board. The four-layer motherboards were manufactured by BSW, have only 512K on the motherboard, and do not have the new 'Fat Agnus' chip found in

most Amiga 2000's.

- If you added a new FPU to the machine, double check the crystal conciliator to make sure it is oriented correctly and is seated firmly in the socket. There will be a small dot, notch, or angled corner on the oscillator: this will be on the left side or lower left corner of the conciliator if it is oriented correctly. The lettering on the oscillator will be oriented 'face up' when the oscillator is installed correctly. Also, be sure to change jumpers J4 and J5 when using a separate oscillator for time FPU.
- Be sure to run the memory test program if you have any 32-bit **RAM installed. To run** the memory test, boot the computer from the GVP 68030 disk, double-click on the disk icon when WorkBench has loaded, and double-click over the memory test icon appropriate for your system. There are two memory test icons- one for systems with 4MB of 32-bit. RAM and one for systems with 8MB of 32-bit RAM.
- If you have installed a 32-bit RAM board make sure that the RAM board is correctly connected to the 68030 correctly and firmly seated. Also double-check the SIMMs for correct installation.
- Finally, check all jumper settings against the defaults shown in the tables on page 17.

Once you have double-checked the above, replace the Amiga's case and power up the system. If it is still not working properly, contact your dealer or GVP for assistance.

Author's Note

For the curious, this document was prepared on an Amiga 2000 equipped with a GVP 68030 board, 4MB of 32-bit RAM, an 80MB AT hard disk, and a GVP WT-150 Streaming Tape Back-Up System connected to a GVP Hard-Disk-Card. The manual was typeset on an HP DeskJet printer using the Amiga TEX typesetting package from Radical Eye Software and the illustrations were created with Electronic Arts' Deluxe Paint; the text was edited using CygnusEd Professional from ASDG and CygnusSoft. Special thanks to Gerard Bucas and Kenneth Abramson for their editing skills ,and to George Rapp for his installation scripts and trouble-shooting assistance.

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