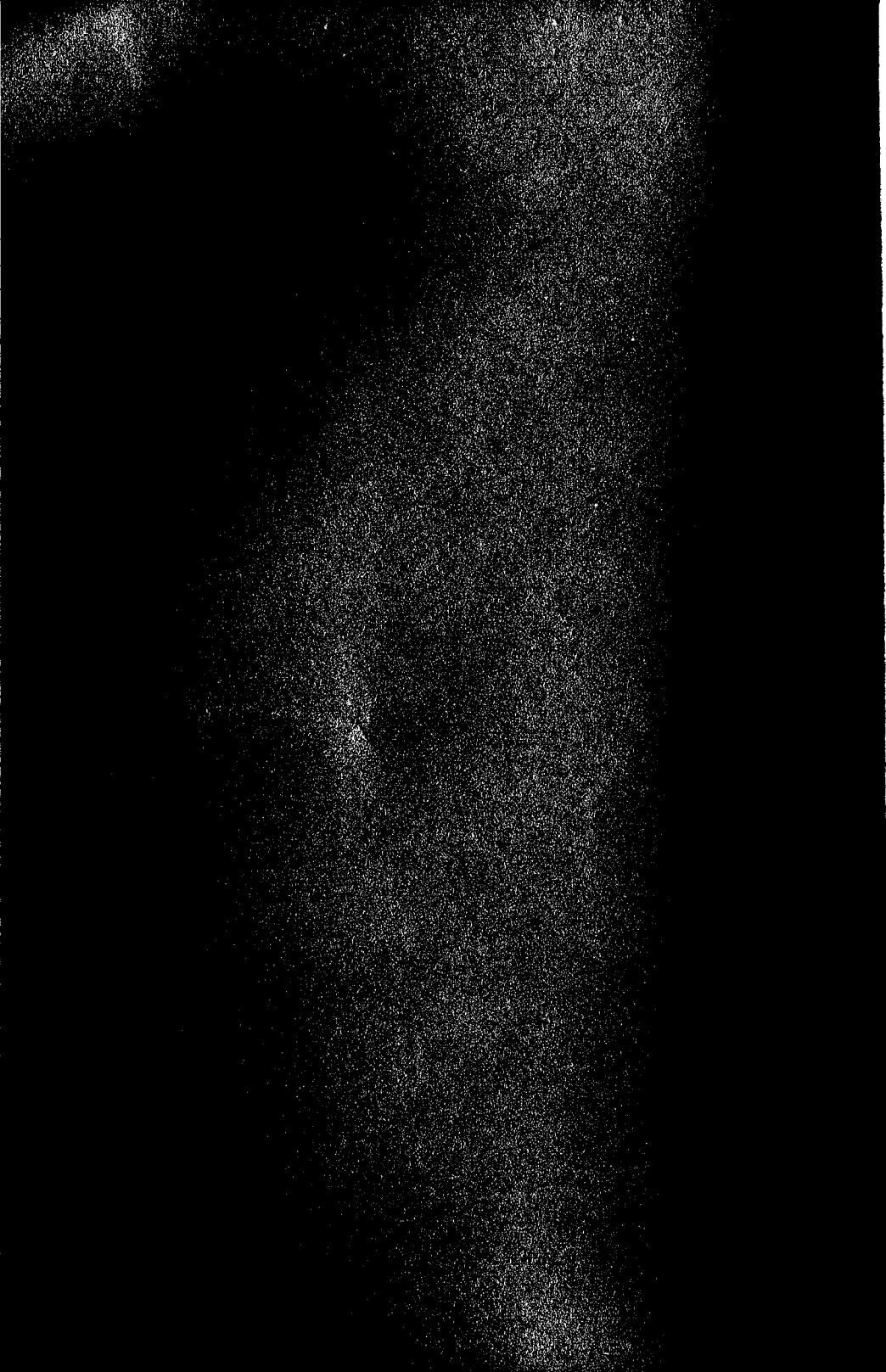
Zeus

040 ACCELERATOR FOR THE AMIGA 2000

USER MANUAL



Zeus

040 ACCELERATOR FOR THE AMIGA 2000

USER MANUAL

68040 / 64 MEGABYTE ACCELERATOR CARD & SCSI II CONTROLLER

Hardware Design by John Meek & Tim Reese
SCSI II Firmware by Ted Keller & John W . Terrell
Software by Michael W. Hartman & John W. Terrell
Manual & Desktop Publishing by JamesTrascapoulos
Edited by Sean A. Moore

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CONTENTS

LIMITED 1-YEAR REPAIR WARRANTY and DISCLAIMER

We warrant to you that for a period of 1 (one) year from the date of your original purchase, our product shall be free of defects in the material and workmanship. OUR WARRANTY EXTENDS TO THE ORIGINAL PURCHASER ONLY.

If you discover a defect covered by this warranty, we agree to repair it at our expense, using new or remanufactured components at our sole discretion. PPI's liability is limited solely to the repair of the defective product.

WHAT YOU WILL NEED TO DO:
To obtain free repairs under this warranty, you MUST deliver the product with its original sales receipt to PPI. You will be responsible for paying any costs associated with the delivery to PPI. PPI will bear the cost of returning the product to you via the shipping method of PPI's choice. Costs of any other shipping method must be borne by you. Before returning the product, contact PPI's customer service department to obtain a Return Merchandise Authorization (RMA) number. No returns will be accepted unless the shipping label or outer box is clearly marked with the RMA number.

WHAT IS NOT COVERED BY THIS WARRANTY:
This warranty does not cover any damage or malfunction resulting from the improper handling, accident, abuse, misuse, failure of electrical power, use with or damage to other products used in conjunction, damage while in transit for repairs, repairs or modifications attempted by any unauthorized person or agency, or any other reason not due to defects in materials or workmanship. The warranty does not apply to and product having an altered, defaced, or missing serial number.

The warranty does not cover any software or media, which are licensed or sold "as is", without any warranties of any kind. Should such software fail to work or be unsuitable for your use, you must assume the full responsibility for service or replacement.

WHAT PPI WILL NOT BE RESPONSIBLE FOR:
We will not be liable to you or to anyone else for any liability, loss or damage for interruption of service, loss of business, data or anticipatory profits, or consequential, incidental or punitive damages resulting from the use (or operation) of the product purchased by you. IN NO EVENT WILL PPI BE LIABLE FOR ANY AMOUNT IN EXCESS OF THE CURRENTLY SUGGESTED RETAIL PRICE OF THE PRODUCT.

PPI has no obligation nor assumes any responsibility for the enhancement or updating of any products you have purchased.

DISCLAIMER:
THE ABOVE WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED (OTHER THAN THOSE WARRANTIES IMPLIED BY STATE LAW.) ALL STATE STATUTORY IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE SHALL BE LIMITED TO A PERIOD OF 90 (NINETY) DAYS FROM THE DATE OF YOUR ORIGINAL PURCHASE. NO WARRANTIES, EITHER EXPRESS OR IMPLIED, WILL APPLY AFTER THIS PERIOD.

Some states do not allow waivers, limitations or modifications of implied warranties, or the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

FCC CLASS A NOTICE
This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection from interference when the equipment is operated in a commercial environment. The equipment generates, uses, and can radiate radio frequency energy and, if not installed in accordance with the instruction manual, may cause harmful interference in which case the user will be required to correct the interference at his own expense.

INTRODUCTION

Zeus represents the top of line in 68040 accelerator and hard drive controller technology; no other Amiga product offers Zeus' capabilities on a single elegant and efficient board. Progressive Peripherals engineered Zeus to be the best by providing upgradability to faster 68040 processors and expansion to a full 64MB of RAM. An Amiga 2000 with Zeus has the power to eclipse workstation computers costing thousands of dollars more.

One of Zeus' most unique and perhaps least recognized features is its true **Fast SCSI II** DMA hard drive controller. The SCSI II standard is fairly new to the personal computer industry and Zeus is the first Amiga product to support fast SCSI II peripherals. The on-board NCR SCSI II controller, and Zeus' unique optimized SCSI II device, support data transfer speeds of up to 10 megabytes per second. This translates to incredibly fast load and save times, and contributes to faster completion times on large video and graphics projects.

Whatever your application - graphics, video, CAD, desktop publishing, research - Zeus' combination of 68040 accelerator speed, optimized RAM access, and fast SCSI II data transfers give you the edge.

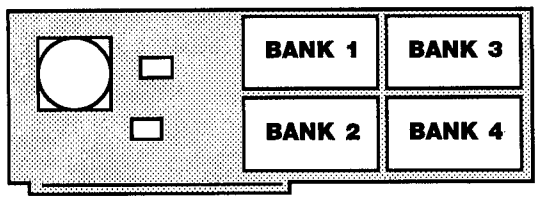
OVERVIEW: ZEUS FUNDAMENTALS

CHOOSING RAM SIZE AND TYPE

Zeus can use many different types of RAM; *nibble, static column* and *fast page* memory. There are a few considerations that should be paid to selecting memory.

The 68040 thrives on its ability to burst information through RAM. *Nibble Mode RAM* doesn't support burst mode transfer and is therefore not recommended. *Static memory* supports burst mode, as does *Page Mode RAM*, and since Zeus supplies the burst signal to drive fast page memory as fast as static column RAM, the high-price of static memory doesn't bear out any improvement in performance. This leaves *Fast Page memory* as the best choice of RAM.

Zeus can use both *1MBx8 (1 MBYTE) & 4MBx8 (4 MBYTE) RAM SIMMs (SINGLE IN-LINE MEMORY MODULES)*, and must be populated in *four-module groups*. For example, if you use 1MBx8 SIMMs, you can configure Zeus for **4**, **8**, **12** and **16** Megabytes in increments of 4 MBs (4 1MBx8 SIMMs). If you prefer to use 4MBx8 SIMMs instead, you populate the card in 16 MB increments, yielding **16**, **32**, **48** and **64** Megabyte configurations. Zeus can also use any combination of 1MBx8 and 4MBx8 SIMMs, yielding many more possible combinations, *just remember that it will* ***require*** *at least 4 modules (of each type) per installation!*



Board configuration and installation of mixed memory types is a simple process; all you need to do is tell Zeus how many 1MBx8 SIMM banks of RAM you've installed. You no longer have to tell the system exactly how much memory you have - once Zeus understands that, for example, the first two banks are populated

NUMBER OF 1MBx4 BANKS:	B1	B2	B3
0 BANKS	■	■	■
1 BANK	□	■	■
2 BANKS	■	□	■
3 BANKS	□	□	■
4 BANKS	■	■	□

by 1MBx8 SIMMs, it checks the rest of the card for 4MBx8 SIMM groups and configures the card accordingly. These are the jumper settings for populating 1MBx8 SIMM sets in Zeus. **PAGE 38** shows all the possible configurations.

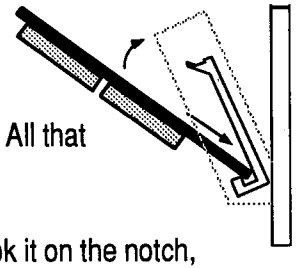
By now you've probably realized that if you want to reach 64 Megabytes, you can't do it with 1MBx8 SIMMs in the system. Just remember, 1MBx8 SIMMs are inexpensive and can be a great way to populate the Zeus for very little money, but you may have to replace that RAM at a later date.

SPEED

We at Progressive use an extremely efficient RAM controller chip, multiplexing the RAM on our card, so that Zeus addresses RAM fast, as opposed to having to having to buy excessively fast (and excessively expensive) RAM. *A 28MHz Zeus card requires only 80ns RAM to operate without any wait-cycles*, and although 60ns RAM at 28Mhz would offer little speed improvement, it is up to the user to decide how much they want to spend on expensive RAM in exchange for a few percent improvement in speed.

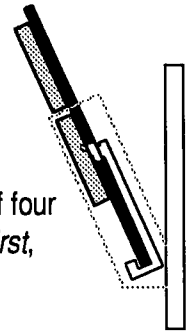
Should you plan upon upgrading the Zeus to *33MHz*, plan on using a faster RAM speed, like *60ns SIMMs*, from the outset. Like before, you could also use 40ns RAM at 33MHz, but the same speed-vs-cost variable comes into play. **We at Progressive suggest that you use only 80ns SIMMs on 28MHz cards, and 60ns SIMMs on 33MHz cards.** As well, limiting the number of processes running on your Amiga can give you a considerable boost. Just remember that all your RAM will be as slow as the slowest SIMM, so if you plan upon speeding up Zeus, plan upon faster RAM from the start.

POPULATING ZEUS



We at Progressive Peripherals designed Zeus to use SIMMs because they are plentiful, inexpensive and easy to install. All that is required is:

- Tip the SIMM into the holder and hook it on the notch,
- Press in and then down into place. You'll know it's in place when you feel a slight click, and the positioning tabs on the SIMM holder show through the hole on the memory module.



Remember, you have to install SIMMs in groups of four at a time, in the same bank; *install the top SIMM first*, that way you'll have an unobstructed view of the remaining SIMMs when it is their turn.

NOTE: If you are using a combination of 1MBx8 SIMMs and 4MBx8 SIMMs, the 1MBx8 units have to be placed in the **first banks available**. What this means is that 1MBx8's have to occupy banks 1 (or 2 or 3..however many you have to installed) before 4MBx8 SIMMs can be installed, or else the system will not properly recognize or use the mounted RAM.

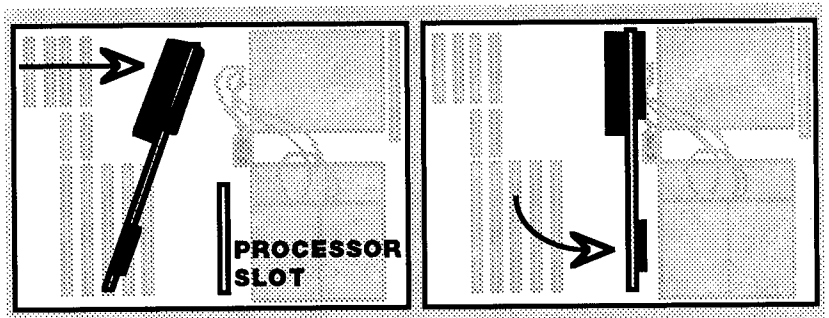
JUMPER SETTINGS

Zeus will automatically check for how much RAM is installed, but you still must tell it what kind of SIMM to find. Choose the configuration that matches the number of 1MBx8 SIMM you have installed, and jumper B1 - B3 accordingly. See **PAGE 38** for all jumper settings.

BOARD PLACEMENT

Installing the board is a simple matter - but if your RAM is not properly seated you may find that the wires coming out of the Amiga's power supply can pull a SIMM out of its socket. We

suggest that you remove the plastic card-edge guide in the front of the Amiga's chassis, and swing the Zeus in from the side, as in the illustration. This will keep the RAM from being moved out of place while Zeus is being installed.



*Just swing the card in from the rear, allowing the power cables to be pushed back slightly. Then swing the front of the card forward, and then seat the card in the socket. If, when the Amiga is powered-up, a **solid red screen** appears, remove all boards and try the system with just the CHIP RAM and the WB2.04 ROM. A solid screen can mean a bad Amiga ROM, and if you've just upgraded the ROM to run with Zeus, this could be the problem. If it passes, reseat the board and try again with just Zeus. **A red screen with text** generally means that Zeus is not AutoConfiguring into the Amiga properly; a mis-seated card or a conflicting 16-bit RAM card can cause this. For other causes, please see **PAGE 39, TROUBLESHOOTING.***

A LAST WORD ON MEMORY

The Amiga 2000, when first introduced, had the then-unheard of ability to address up to 9 Megabytes of RAM. Since then, we Amiga users have developed the need to consume memory beyond a mere 9 Megs, yet the 2000 architecture hasn't changed - it's still stuck with a 9 Meg limit. Zeus gets around this by using the 68040 to directly address all memory to the system - it does not use a mapping window, as some other accelerator boards may. To the 2000 however, Zeus is just another 2 megabyte chunk of memory to address.

The 2000 can push about *1.5 Megabytes per second* through its bus, so there's no need to address more than 2 Megs. Remember that the Amiga 2000 has that 9 Meg limit; if you have an 8 MByte

card, 1 Meg in CHIP RAM on the motherboard, and Zeus, things aren't going to work right. That's 11 Megs, well over the limit.

The ZORRO II Amiga expansion specification, says that RAM has to be upgraded by **1**, **2**, **4** and **8** Megabytes - **only**. Usually this isn't a big deal, as many manufacturers produce RAM boards that configure as two cards, say a *2 Meg* and a *4 Meg* card, to achieve a *6 Meg* population. Unfortunately, this isn't totally ZORRO II compliant. Often, it is accomplished by allowing the main board to configure itself (through the Amiga's AutoConfig process) and then *forcing* a second card into the system, without letting it "naturally" AutoConfig. This forced card can stop other cards from configuring, such as the BridgeBoards and CBM accelerators like the 2620. Because of Zeus' advanced design, we'll always have to configure first, before other cards. If you install Zeus and have a system lockup, remove all the cards but Zeus and add them in until the culprit card is found.

We recommend that if you choose to use 16-bit RAM on a secondary card, don't populate the card beyond the legal *4 Megabyte* limit; if you have a 6 Megabyte card, and it uses SIMMs, you can always move that extra RAM over to the Zeus. Also, beware any RAM board with memory *120ns or slower*, as it can cause memory configuration problems because it's just too slow to configure.

THE DANGER OF STATIC ELECTRICITY

The greatest potential for permanent damage to your Amiga 2000 or Zeus comes from static electricity. Even the smallest electrical discharge from you to an exposed computer chip can ruin the microcircuitry inside that chip; for example, if you run your hand across a silk tie, *you've just charged yourself to around 400 volts.* The current is low, so you don't really feel much of a shock, but your hardware will. Good reason that you should do everything possible to avoid static electricity and to ensure that you ground yourself each time you work with electronic parts. Remember,

any damage that occurs from static charge is NOT covered under the warranty!

TO REDUCE THIS DANGER, WE SUGGEST THE FOLLOWING:

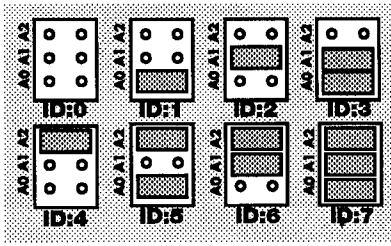
- Do not work on or near carpeting. Work at a table over a tiled, linoleum or concrete floor.
- Don't wear clothes which attract static electricity (wool, nylon, polyester, etc.)
- Ground yourself each time you are about to pick up any electronic component. The metal frame of the computer itself or the metal screw on a light switch are acceptable grounds.

SCSI DEVICES

Zeus is compatible with all standard SCSI and SCSI II compliant hard drives. Follow these simple steps to install a single hard drive onto the Zeus controller.

1. SET THE SCSI ID NUMBER.

Since up to seven SCSI peripherals may be attached to Zeus, each must have a unique "ID" number for identification. SCSI ID numbers range from 0 to 7; Zeus's own ID is 7, so drives attached to Zeus must not have their ID set to 7. SCSI ID numbers are set using the hard drive's SCSI ID jumpers; hard drives usually have 3 rows of jumpers, but you should refer to the user's guide accompanying your drive before removing or installing jumpers at random. Most drives have a factory default ID of either 0 (all jumpers removed), or 6 (upper two jumpers installed). You may choose any number between 0 and 6. If you do not have a user's guide for your hard drive, the ID number can

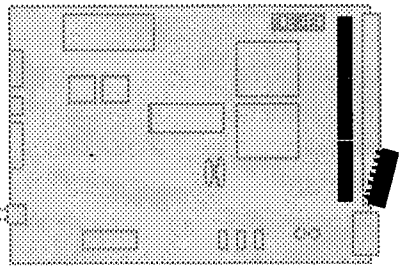


An example of SCSI jumpering : These SCSI IDs are for Quantum drives, but it should give you an idea of how SCSI jumpering works. Your drive may differ - always consult your drive's documentation first. ***Do not change any other jumpers on the drive!***

be identified by the Zeus TOOLBOX software, which is described later in this manual.

2. TERMINATE THE SCSI BUS.

To ensure reliable and efficient operation, the last SCSI device connected to Zeus must be "terminated"; most SCSI hard drives have terminating resistor packs, plugged into the hard drive logic board near the SCSI connector. A typical resistor pack is pictured below:

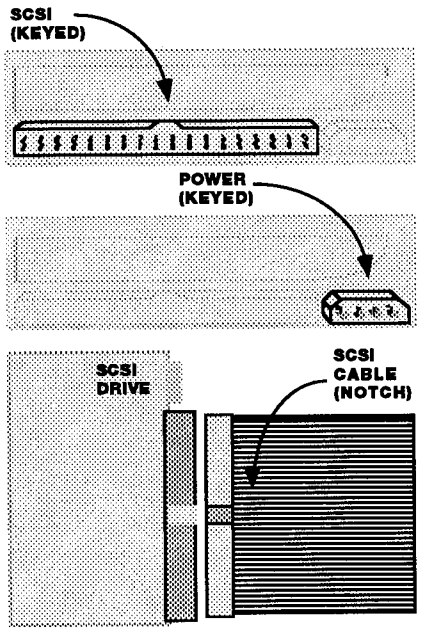


The SCSI bus is terminated when the resistor packs are installed in the drive. If your drive does not have resistor packs, don't panic! Resistor packs are inexpensive and relatively common; a local computer dealer or a RADIO SHACK can supply you with resistor packs should you need them.

Some systems will work without terminating the SCSI bus, although this isn't recommended because the importance of terminating the SCSI bus increases as more peripherals are connected. *Remember, SCSI devices at either end of the chain must be terminated.* If you attach any peripherals to Zeus's external SCSI port, only the *last external SCSI peripheral* should be terminated. As well, the first internal drive (or Zeus itself) should be terminated, yielding a SCSI "chain" with termination at each end - this is standard protocol in the world of SCSI devices.

3. CONNECT THE SCSI CABLE.

Zeus is supplied with a SCSI "daisy chain" cable for connecting SCSI peripherals internally. Up to two SCSI peripherals may be connected using this cable. Your dealer may stock additional cables for special installations. Most SCSI cables and connectors are "keyed", to prevent inserting them improperly.



If your cable or connector is not keyed, you must make certain that pin 1 (the top pin) of the Zeus SCSI connector is connected to pin 1 of your hard drive's SCSI connector.

SCSI cables have a colored stripe on one side; if you are uncertain of which pin on the hard drive's SCSI connector is pin 1, connect the marked side of the cable to the side of the drive connector closest to the large 4-pin power plug (pin 1 of all SCSI drives is the pin closest to the power connector). Then connect the marked side of the cable to the top side of Zeus's SCSI connector.

External SCSI devices are usually mounted in a "box" with a power supply and a 50-pin "centronics" style external connector. To connect an external SCSI device to Zeus, you'll need a cable with a 25-pin RS-232 male connector to 50-pin centronics male connector. These are common cables, and are available from your local dealer or directly from PPI.

HARDWARE INSTALLATION

Installing Zeus is simple:

1. Remove the Amiga's case screws, four on the sides and one in the back.

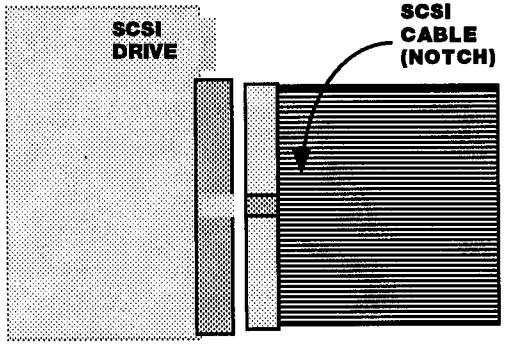
2. Remove the Processor Slot backplate; it is in the rear of the case, next to the power supply. Two smaller screws hold it on.

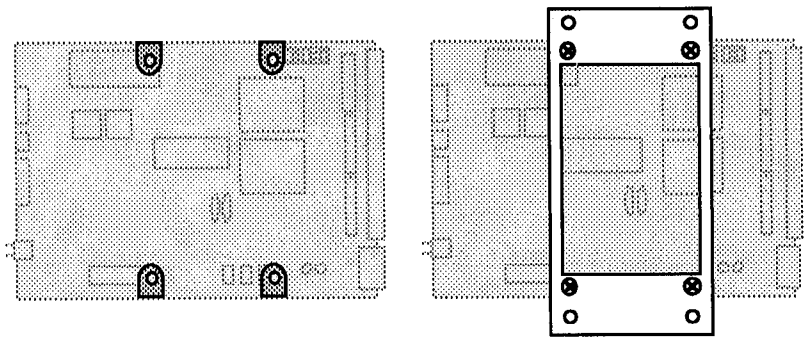
3. Populate Zeus with RAM (at least 4 MBs preferred) and jumper it accordingly (see the **JUMPER SETTINGS** diagramme, **PAGE 38**).

4. Attach the hard drive:

• *IF THE DRIVE IS TO BE MOUNTED ON ZEUS:*

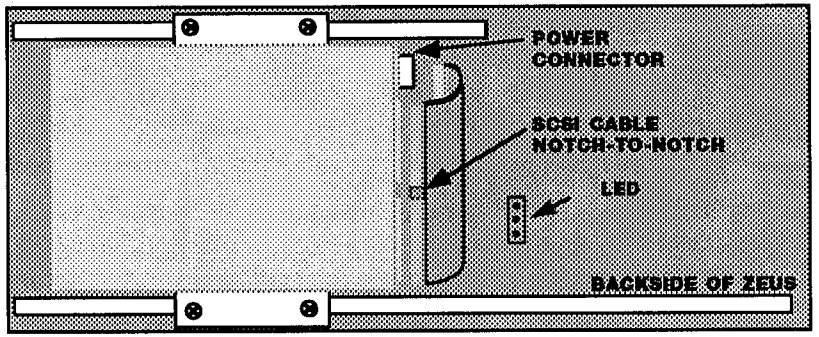
Attach the SCSI cable, power cable (to hard disk) and LED cable (to Zeus). Some cables are keyed for power; plugging it in the wrong way can lead to what technicians call "a bad thing", i.e., something blowing out. This is very serious and will void your warranty!





Just screw the drive to the inside set of holes on the mounting plate, and then turn the drive over...

*...then just screw the drive onto the card. You should have already attached the cables - it makes life **much** simpler.*



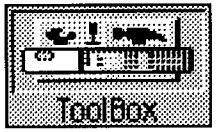
Plugging in the right way is easy if you just pay attention: the power cable is trapezoidal and can only go in one way. The SCSI cable is usually keyed with a notch on the end, and a companion notch in the socket end - this insures that the SCSI data cable is plugged in correctly. Now all that is required is to attach the drive, via the mounting plate, to Zeus.

• *IF THE DRIVE IS TO BE MOUNTED IN THE AMIGA:*

Attach power cable, SCSI cable and LED cables to drive as in the previous example. Attach the drive to the chassis; *never allow the drive electronics to contact the chassis!* See your dealer for proper drive mounting hardware.

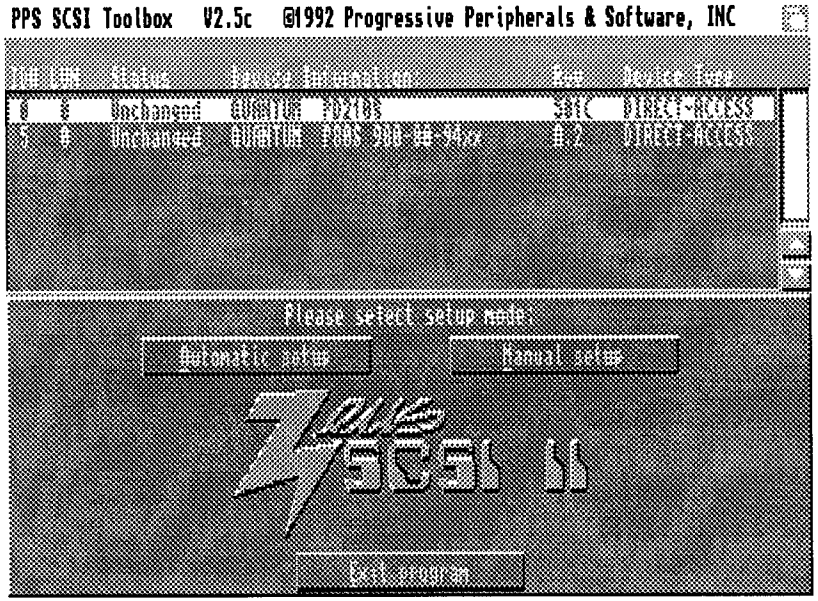
5. Insert Zeus into the Processor Slot. Be mindful of the fan as you insert the card past the drive bay, as it should pass around and underneath the chassis, into the slot. For a little extra room, you may pop out the small plastic card guide in the front of the bay, allowing you to swing the card in easily. (*Please see **PAGE 5** for further notes on card installation*) Now that the card is installed, the next step is to get the hard drive running and install the system software.

SOFTWARE INSTALL: FOR A NEW HARD DRIVE



TOOLBOX

Power up your Amiga and run the TOOLBOX programme. The first thing you have to do is get the Amiga to recognize the drive. Zeus will begin by searching for all SCSI drives attached to the system; once the drive (or drives) have been located, you'll have to partition, mount and format the drives. With TOOLBOX we have two ways to accomplish this: ***AUTOMATIC***, where we do all the partitioning and formatting, or ***MANUAL***, where you can control nearly every step. **NOTE: Any hard drive already using the "Rigid Disk Block" (RDB) standard can be connected to Zeus without formatting - just install the drive and boot Zeus up.** For optimum performance, you should use TOOLBOX to check the Mask Value of every partition; refer to **PAGES 16-17**.

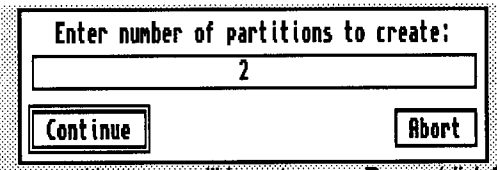


This is the main Zeus screen; from this point you'll decide whether you want to have Zeus do it all for you, or whether you want to do it all yourself. For the most part, this screen will never change; buttons and requesters will come and go, but this background will stay the same. From here on, we'll just show those new requesters, as they should appear.

**** WARNING * You CANNOT use AUTOMATIC SETUP to partition a hard drive you have booted from; the AUTOMATIC SETUP will FAIL if you try to partition the drive you have booted from. Boot the system from a WORKBENCH disk, then proceed with AUTOMATIC SETUP.***

AUTOMATIC:

AUTOMATIC installation is extremely simple. When selected, you will be asked how many drive partitions you would like. Since the software defaults to **2**, we'll go along with that - two partitions. When we click on **CONTINUE** (or press the **RETURN** key) **TOOLBOX** will low-level format and partition the drive into two equal-sized partitions. Low-level formatting can take seconds on some drives, minutes on others. Zeus software will now do an AMIGADOS format and and then ask you if you'd like it to copy a system disk onto your newly formatted BOOT partition (DH0:).

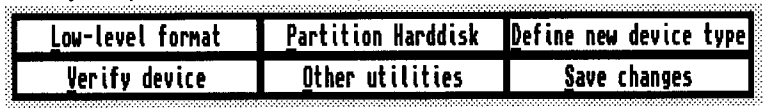


DANGER, DANGER, WILL ROBINSON! *Once you are presented with a partition screen, and once you have selected the number of partitions, you will have to press **RETURN**/click **OK**, or click **CANCEL** if you're at all not sure. Clicking **OK** or hitting **RETURN** WILL completely erase the hard drive, to a point where no hard drive restore programme can salvage it. Always be certain that this is what you want to do; partitioning a drive is final!*

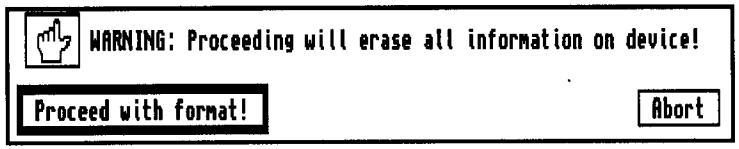
If that is what you want, insert your WORKBENCH disk and click **PROCEED** and start feeding disks into the system. Usually it is best to copy all the disks in the latest WORKBENCH release; if you don't, you could find yourself having to reinstall WORKBENCH from the WORKBENCH boot disk.

If you would just rather use CBM's WBINSTALL programme to install the WORKBENCH 2.04 system software, then click **No** and exit the software. When you reboot your system, you'll have two equally low-level formatted partitions. Be sure to have a bootable WORKBENCH disk (or preferably, a copy of WORKBENCH - never work with original copies) to start the system.

MANUAL:
MANUAL installation will take a couple of steps, but it assures you of having exactly what you want, exactly as you want it. You'll be faced with a panel of six buttons, each controlling a particular part of the process. You can click on any of them with the mouse, but they also respond to a keypress (the underlined letter is the hotkey, so please use caution.)



LOW-LEVEL FORMAT *(L)*
With this function you will do a primary format of the drive. This is different from an AMIGADOS format as everything, not just file headers, but all data, all partition information - *everything, is eràsed!* You should do this once to verify all media errors and

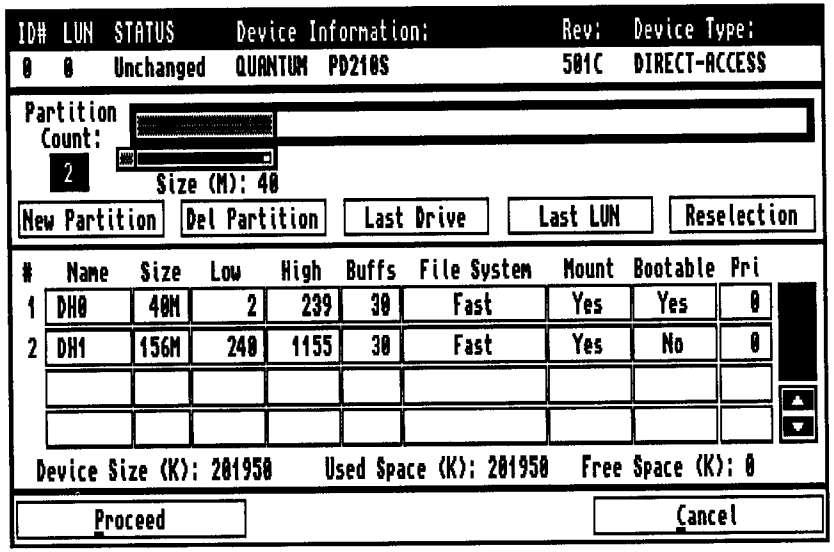


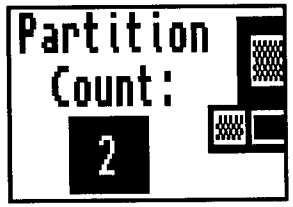
give the drive a chance to map them out from the start. After low-level formatting the drive, you should then use **VERIFY** to be certain that all errors have been mapped out.

PARTITION HARD DISK *(P)*
Partitioning a drive isn't as daunting as it may look. A partition defines the area that AMIGADOS will format and make useable, and defines that area with a specific volume name, like **DH0:** or **DH1:** Partitioning can be done two ways:

- By dragging the slider, you can directly set the size of the partition on a sliding scale basis. Then clicking on **NEW PARTITION** and then clicking on a *black* (non-selected) area will *add* partitions, or..

- Clicking on **SIZE** and then entering a size in the requester.

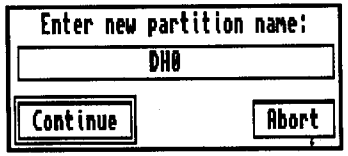




- Clicking on **DEL PARTITION** and a *yellow* (highlighted) area will *delete* that partition and make the area available to other partitions. If a *black* area resides next to a *grey* area, but cannot be added to the existing area, click on the **EXPAND GADGET** (the small box at the end of the existing partition.) This gadget selects which cylinder boundary you are modifying, either the top or the bottom.

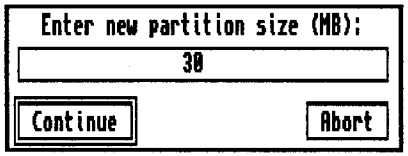
- **LAST DRIVE AND LAST LUN:** These two options set the last *logical device* or last *LUN* (*Logical Unit Number*). Depressing either button will inform the system that the drive or partition selected is the last drive (or LUN) in the SCSI chain, and that further testing beyond this drive is unnecessary.

Other options set the name, size, format , etc.; you can directly set these by clicking on any of these gadgets:



- **NAME:** sets the physical name of the partition. It can still be logically named anything you like later in the AMIGADOS

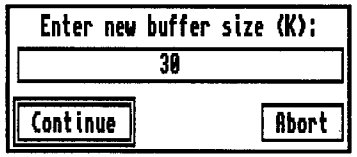
format. Popular Amiga convention suggests that you name the partitions as **DH0** (Drive Hard 0), **DH1**, etc. (*a colon ":" after the name isn't needed as the software internally adds it for you*)



• **SIZE**: Just type in the size you want your partition to be in Megabytes (if the partition is small, it will appear in Kilobytes). You'll see in the **FREE SPACE** area at the bottom how much is yet available for new partitions.

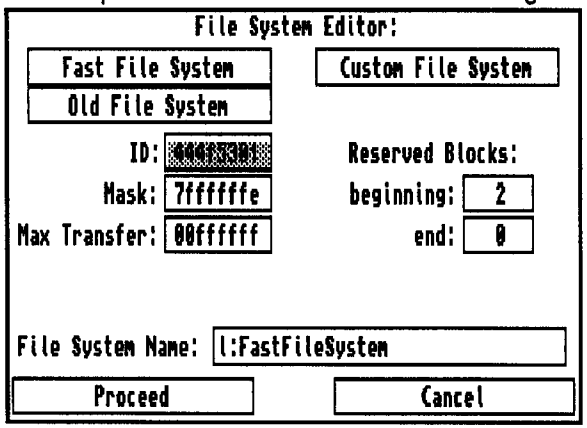
• **LOW**: cylinder, where the first cylinder resides for the partition.

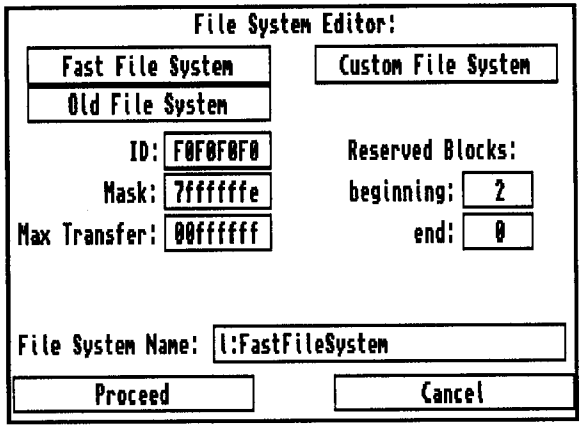
• **HIGH**: cylinder, where the last cylinder for the partition resides.



• **BUFFS**: The amount of memory buffers allocated to the partition.

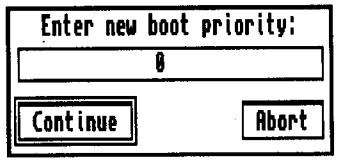
• **FILE SYSTEM**: Since WORKBENCH 1.3 and through to 2.04 (and up), AMIGADOS has established the FAST FILE SYSTEM (FFS) as the preferred file structure. Besides being more than twice as fast as the OLD FILE SYSTEM (OFS) it is much more resilient to data errors and validation errors, and allows for pure 32-bit data transfer. For each file system there is an appropriate **MASK VALUE**, and in the case of the FAST FILE SYSTEM, the mask value is **07FFFFFE**. The OLD FILE SYSTEM is typically **07FFFFFE**. Zeus works best with a FAST FILE SYSTEM mask value.





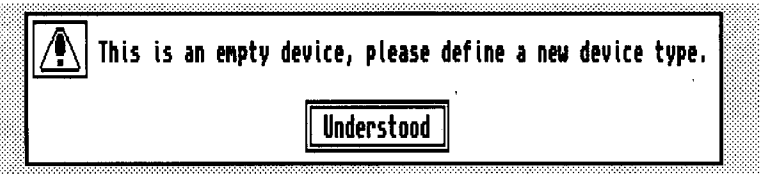
The other main alternative is the CUSTOM FILE SYSTEM, where you can create a partition for non-AMIGADOS file systems, like AMAX II/II+. When installing a non-AMIGADOS device like AMAX, the device is often dependent upon a *custom device driver* - consult the manufacturer of the device for specific instructions.

• **MOUNT**: Answer **YES** and the partition is automatically mounted (made available) at bootup. Answer **NO** and the partition will require a **MOUNT** command from AMIGADOS to be made available.



• **BOOTABLE** and **PRI**: If **YES**, the partition will try to boot the Amiga, as long as a filesystem is installed. **PRI** means *priority*, and if you have more than one bootable partition, the one with the highest priority will boot first. This is a powerful tool for removable media devices like a SYQUEST, where one could have different configurations or systems on different cartridges. Should you not want to boot off of the SYQUEST (for example), the lower-priority hard disk would take over.

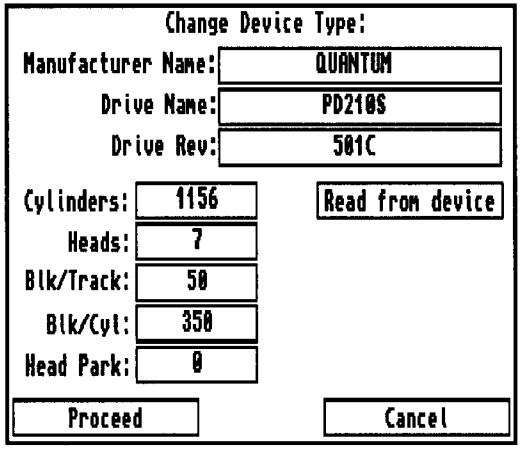
Remember, any changes that you make in the **PARTITION** section have yet to be saved! Click on **PROCEED** to continue, and then click on **SAVE CHANGES** to make it all permanent. If you don't like what you've done in **PARTITION**, and don't want to change your partition setup, just click **CANCEL** at anytime.



If you add a new drive and see a warning like this, you'll have to define a new device type before continuing. Click **UNDERSTOOD** *and proceed to the* **DEFINE NEW DEVICE TYPE** *section.*

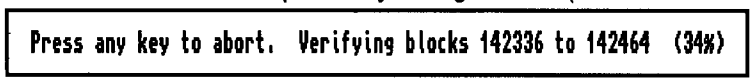
DEFINE NEW DEVICE TYPE: ***(D)***

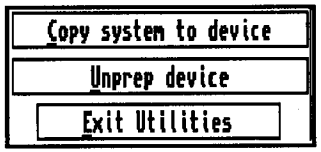
This reads the drive's identification (generally off of its ROM) and installs the information on the drive as part of the RDB (RIGID DISK BLOCK). Use this to acquaint Zeus with any new drive being added to the system.



VERIFY DEVICE: ***(V)***

Use **VERIFY** after a drive has been low-level formatted to be certain that any media (hard disk) errors have been mapped out. Data can also fail on a drive because the hard disk may not map out all the media errors using a "quick" format, as in COMMODORE'S **FORMAT** programme on its **INSTALL** disk; in this case the block headers have been erased only, and the rest of the drive has been untested. ECC errors, usually indicative of a crashed head, are ignored in a "quick" format. **VERIFY** proceeds to check the drive for hard errors and then reports any failing sectors (to be added to the bad block list). It is wise to use **VERIFY** because it will not destroy any data on any valid sector while verifying the hard disk.





OTHER UTILITIES ***(O)***

COPY SYSTEM TO DEVICE ***(C)***

This will copy a WORKBENCH disk to your hard disk provided the drive has been AMIGADOS formatted first..

UNPREP DEVICE: ***(U)***

This removes the RDB (RIGID DISK BLOCK) from the drive, removing all traces of the Zeus installer, and every bit of your data as well - use with extreme caution!

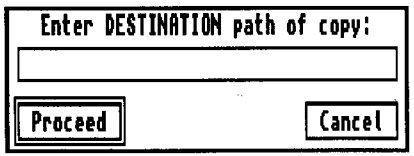
SAVE CHANGES ***(S)***

Some functions (like **DEFINE** and **PARTITION**) need to be saved to make them permanent. **SAVE** the changes and reboot the system, or exit the software (using **CANCEL**) without saving changes and original values will remain in place (just so long as you haven't done a low-level format).

Now that you've low-level formatted your drive, verified it, partitioned it to your liking and have saved the changes, it's time to reboot the system and format the new hard disks.

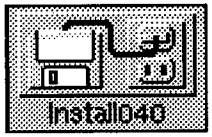
You should get a WORKBENCH screen with a hard disk icon or two. Click on the icon once and go to the WORKBENCH menu strip at the top of the screen. Under **ICONS**, select **FORMAT DISK..** A requester will appear asking if you really want to do this. Click **OK**.

The partition will be formatted for AMIGADOS and made ready for software. When all the hard disk icons have been formatted, click on **TOOLBOX** again. At this time you may want to choose to have Zeus install your software; if so,select **OTHER UTILITIES** and then **COPY SYSTEM TO DEVICE**. Choose your first partition as the boot partition, and then insert your WORKBENCH disk in



DF0:. Click **PROCEED** (or hit **RETURN**) and your WORKBENCH disk will be copied to Zeus. You can use this to copy the rest of the AMIGADOS disks to the system, or reboot under the AMIGADOS INSTALLER disk and use the **UPDATE** programme.

SOFTWARE INSTALLATION: FOR EXISTING SYSTEMS



Software installation for the Zeus is performed through the Installer programme, found on the included disk. Click upon the **INSTALL040** icon and follow the questions:

INSTALL FOR REAL: Install the software onto your hard disk/system disk

PRETEND TO INSTALL: A good way to practice before installing, this option will walk you through all the steps in the Installer before actually installing the software.

Decide upon either option and click on **PROCEED** to go on, or Abort Install to stop the installation procedure.

SELECTED DRAWER: where you want the software to be installed; we suggest that you choose your **SYS:** drawer, as in the default. You could choose to **MAKE (A NEW DRAWER..)**, and then give it a name like:

SYS:68040

The software directory will be nested within that drawer, so that instead of finding your software with one drawer, it will be within a drawer, within another drawer.. which can, of course, can get pretty darn confusing. Which is probably also why God created defaults..

Once you've decided upon a drawer, you'll see **INIT040**, **CPU040** and **SWITCH** copied over to your system drive. Additionally, our own **PPI040.LIBRARY** will be copied to the LIBS: drawer; this library is required to run many functions of the '040 software. If you ever find that programmes like SWITCH or CPU040 won't run, check to see that the PPI040.LIBRARY is in the LIBS: drawer, and if not, recopy it from our floppy. Everything runs through INIT040, is

manipulated by CPU040, and is terminated through SWITCH; see **PAGE 23, SOFTWARE AND UTILITIES**, for specific information on each programme.

SHOULD THE 'INIT040' LINE BE ADDED TO YOUR 'S:STARTUP-SEQUENCE' FILE? The $64,000 answer is, of course, "Yes." The INIT040 programme initializes the 68040, maps the 32-bit memory into the system, copies system pointers from KICKSTART into RAM (for more speed) and addresses the floating-point unit within the 68040. It is installed as, and should always be, the first line in your S:STARTUP-SEQUENCE:

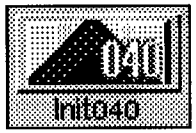
```
SYS:68040/INIT040 >NIL:
```

While the Zeus INSTALLER takes care of the process for you, it wouldn't be a bad idea to know how it appears in the STARTUP-SEQUENCE, should you ever want to change the options. (See **PAGES 23, 27 68040 SOFTWARE / 68040 UTILITIES** for a detailed explanation) The **>NIL:** (spoken as "*output NIL:*") tells the system not to report what happens when the programme is run. The reason for this is that WORKBENCH 2.04 has a rather neat yet slightly clumsy programme called **IPREFS**, that tries to load in all the **PREFERENCES** daemons (what you've chosen as typeface, background pattern, colours, etc.)and should anything interrupt it, like SETPATCH responding to the screen "PATCHING LAYERS..*ect.*", it will cause IPREFS to fail and generally not load your selected preferences. It doesn't hurt the system at all, it just makes it stumble upon bootup.

For this reason, we suggest that you should never add or change anything in your S:STARTUP-SEQUENCE; all modifications should be done in a **S:USER-STARTUP** file. Should you decide to abandon this sage wisdom and add something to your startup file, we suggest that you append it with an **>NIL:**, as any response from the system, especially before the **IPREFS** has a chance to load, will cause an Iprefs failure.

68040 SOFTWARE AND UTILITIES

Zeus comes with 3 primary support programmes on its disk:



INIT040

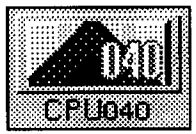
This should be the first line of your S:STARTUP-SEQUENCE. It initializes the 68040, PPI.library and 68040.library.

```
SYS:68040/INIT040 < OPTS > >NIL:
```

This initializes Zeus in your system. Running the programme without specifying any particular option runs ALL the options (this is the default). The four options are:

ADDMEM	Adds the 32-bit memory on Zeus to the Amiga's memory list.
FASTROM	Copies the ROM image into the reserved RAM on Zeus.
FASTSYS	Translates system vectors to the fastest RAM available. If the vectors are already in the fastest RAM available, FASTSYS will not be re-run.

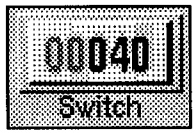
OLDER SOFTWARE HAD AN FPU OPTION, SEE PAGE 44 FOR DETAILS



CPU040

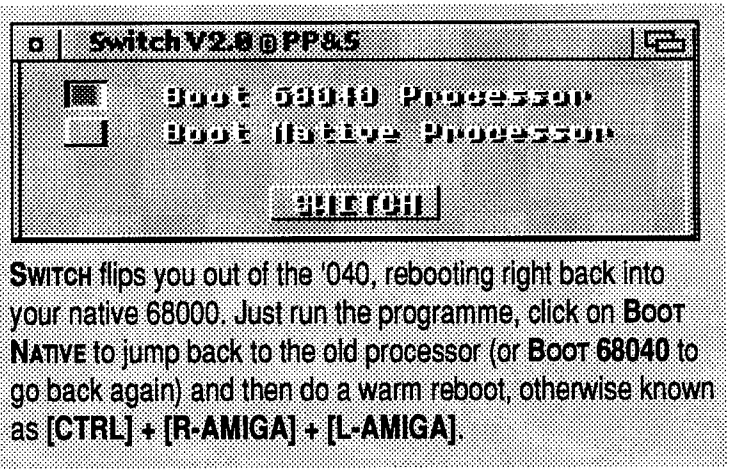
CPU040 is a utility we provide to allow you to dynamically turn on or off any of the caches without having to reboot the system. Running CPU040 allows you to quickly turn off and on *Instruction Cache, Data Cache, Burst mode,* and even toggle between *Write-Through mode* and *Copyback mode,* all with the click of the mouse. **NOTE: PPI040.LIBRARY must be in the LIBS: directory for this to operate.** Sometimes you'll find that an old programme, which may run well on an '030,will crash when loading into Zeus. More often than not the problem concerns *Copyback*, an intelligent cache that didn't exist before the advent of the'040. Simply click on **CPU040** and then click off **COPYBACK DATA CACHE**. Then load

your programme, and click the **COPYBACK** cache back on. As long as the programme doesn't modify its code while running, you should be able to run at full bore. If the programme does modify code, the programme may crash (under 2.04, it's usually the case that the programme just crashes, not the computer, and can be suspended.); just run with **COPYBACK** off in such an instance.



SWITCH

Sometimes, usually right after a difficult spreadsheet or a maddening bit of word processing, you'll need to blow off a little steam. Time to play a game. Some games work **only** with 68000s (they may even die on '030s) and may even need to be booted. Sounds like it's time to use **SWITCH.**



SWITCH flips you out of the '040, rebooting right back into your native 68000. Just run the programme, click on **BOOT NATIVE** to jump back to the old processor (or **BOOT 68040** to go back again) and then do a warm reboot, otherwise known as **[CTRL] + [R-AMIGA] + [L-AMIGA]**.

You'll find that upon reboot you'll only have the amount of RAM that was AUTOCONFIG'ed (Usually 2 MB, which is, if you'll recall from the ***MEMORY*** section, all that would be addressed into 16-bit space - this can be as much as 8 MB) and no hard drive. The 68000 can't really run a SCSI II controller with its limited power, so the drive runs only under the '040. Usually, any game with enough foresight to make its software hard disk installable should make itself '040 compatible too.

68040 GLOSSARY

INSTRUCTION CACHE - A 4096 byte buffer inside the 68040 chip which speeds processing times by storing repeated instructions. The *Instruction Cache* can be turned **On** or **Off** by a number of available utilities.

DATA CACHE - A 4096 byte buffer inside the 68040 chip which speeds processing times by storing local data. The *Data Cache* can operate in either *Write-Through* or *Copyback* modes. The *Data Cache* can be turned **On** or **Off**, or placed in *Write-Through* or *Copyback* modes by a number of available utilities.

MIPS - Meaning "Millions of Instructions Per Second", this term is often used to express the internal speed of a microprocessor. A standard 28MHz Zeus can be expected to yield, on average, between 19-21 MIPS, and a 33MHz Zeus will yield 23-25 MIPS.

MFLOPS - Meaning "Millions of FLoating-Point Operations Per Second", it is perhaps a better indicator of of speed. MIPS can be slightly misleading when comparing systems with different chip architecture. MFLOPs gauge a much more "real world" statistic for the system and should be considered the only appropriate cross-platform speed comparison test.

CACHES EXPLAINED

Motorola's 68040 microprocessor contains a 4096 byte *Instruction Cache* and a separate 4096 byte *Data Cache*; using the two caches to buffer information speeds code execution by several times.

INSTRUCTION CACHE

The *Instruction Cache* works by holding groups of instructions that may be repeated, making them immediately accessible by the CPU. When the Instruction Cache is **OFF**, the CPU reads all of its instructions directly from memory. If groups of these instructions repeat, the CPU has to read them each time they

repeat. When the Instruction Cache is **ON**, however, the 68040 holds the repeated instructions in its Instruction Cache, so that it doesn't have to access the memory until new instructions are executed.

DATA CACHE

Like the Instruction Cache, the *Data Cache* holds local data within the 68040 to avoid memory access whenever possible. The Data Cache may contain CPU-modified data. The Data Cache can be **OFF OR ON** in one of two modes: *Write-Through and Copyback*. At some time, the memory will have to be updated so that it contains the same data as the Data Cache. The Data Cache mode determines when the 68040 updates the memory with the modified data.

WRITE-THROUGH MODE

When the Data Cache is in *Write-Through* mode, the 68040 writes the data held in the Data Cache to memory during the next available memory buscycle. The CPU can still operate on the data held in the Data Cache without waiting for it to be written to memory; this is the traditional Data Cache mode used by the 68030 processor.

COPYBACK MODE

When the Data Cache is in *Copyback* mode, the '040 writes the data held in the Data Cache to memory only when information in the Data Cache needs to be replaced, or when the cache is flushed. The CPU may be working with the data held in the cache, modifying and re-working it; in this way, the 68040 doesn't update the memory associated with the data held in the cache until absolutely necessary. By waiting for one of these conditions to occur before writing the data to memory, memory is accessed as little as possible, speeding processing times.

68040 FILES AND UTILITY PROGRAMMES

The 68040 files and utility programmes that **INSTALL040** copies to your hard disk are as follows:

SETPATCH - An upgrade to the original 2.04 release of Workbench, this version (37.34) upgrades the system software to be 68040-aware; without it, you can expect sluggish performance, hard drive failures and the occasional software crash. WB v2.05 comes distributed with 38.3 and needs to be upgraded as well.

PPI040.LIBRARY - This library contains functions for the Progressive Peripherals line of 68040 accelerators (the library is the same for all of Progressive's 68040 accelerators). This library must be present in the **LIBS:** directory for the other 68040 utilities to operate.

68040.LIBRARY - This library, provided by and licensed from Commodore Business Machines, is activated by the Init040 or SetPatch command in your S:Startup-Sequence. This library makes certain patches to the 2.04 operating system, optimizing it for the 68040 processor. To operate, 68040.LIBRARY must reside in your **LIBS:** directory.

SYSINFO - SYSINFO is a public domain programme, written by Nic Wilson, that provides information about the system software, available memory, available drives, and internal hardware. It also provides speed comparisons between your Amiga and other Amiga systems. Complete SYSINFO documentation is on the distribution disk in file form. **SYSINFO is not a PPI product and we can not provide technical support for this programme.**

DEVELOPING SOFTWARE ON AND FOR THE 68040

Most code written for the 68000 processor will run on the 68040 as well. There is, however, some software that will not run properly. Programmes that have self-modifying code may not run with Instruction Cache or Copyback Cache on. Any programme which by-passes the operating system may not run when the Data Cache is in Copyback mode. You should follow the precautions below when writing software on the 68040:

- Don't use the upper 8 bits of 68000 addresses to store tables. The 68040 uses all 32 bits of each address. Any programme which uses the upper 8 bits of an address will most likely fail on a 68040.

- Base time dependent code on a system clock instead of the CPU speed. Since processors can have different clock speeds, a single timed operation will take different amounts of time when run on different processors, or processors running at different speeds. Test everything written on a 68040-based Amiga on a 68000-based Amiga.

- Code that runs properly on the 68040 may fail on a 68000 due to data word alignment. The 68000 requires word data on the stack to be word aligned, the 68040 does not. Some instructions exist only in the 68040. Be sure your compiler is not generating 68040 specific code if the programme is to run on other processors as well. The 68040 FPU does not contain all the instructions found in the 68882 coprocessor. Code that makes use of these instructions will not run on the 68040 unless these instructions are emulated by the FP040 software (provided). These missing instructions are as follows:

FACOS - Floating-Point Arc Cosine
FASIN - Floating-Point Arc Sine
FATAN - Floating-Point Arc Tangent

FATANH - Floating-Point Hyperbolic Cosine
FCOS - Floating-Point Cosine
FCOSH - Floating-Point Hyperbolic Cosine
FETOX - Floating-Point ex
FETOXL - Floating-Point ex-1
FGETEXP - Floating-Point Get Exponent
FGETMAN - Floating-Point Get Mantissa
FINT - Floating-Point Integer Part
FINTRZ - Floating-Point Integer Part, Round-to-Zero
FLOG10 - Floating-Point Log10
FLOG2 - Floating-Point Log2
FLOGN - Floating-Point Loge
FLOGNP1 - Floating-Point Loge (x+1)
FSQRT - Floating-Point Square Root
FMOD - Floating-Point Modulo Remainder
FMPVECR - Floating-Point Move Constant
ROMFREM - Floating-Point IEEE Remainder
FSCALE - Floating-Point Scale Exponent
FSGLDIV - Floating-Point Single Precision Divide
FSFLMUL - Floating-Point Single Precision Multiply
FSIN - Floating-Point Sine
FSINCOS - Floating-Point Simultaneous Sine & Cosine
FSINH - Floating-Point Hyperbolic Sine
FTAN - Floating-Point Tangent
FTANH - Floating-Point Hyperbolic Tangent
FTENTOX - Floating-Point 10x
FTWOTOX - Floating-Point 2x

TROUBLESHOOTING

NOTHING WORKING?

The first thing you should double-check is the Zeus' jumper settings; these can be found in their entirety on **PAGE 38**. An inability to boot the system is most likely a card configuration problem; please go to the diagnostic flowcharts on **PAGES 39, 40 - 41.**

RED SCREEN IN THE MORNING, USER TAKE WARNING..

If you plug in the Zeus and find that the only thing working hard is you, i.e., no functionality on the card at all - **don't panic!** The Zeus has a built-in diagnostic on power-up, displaying different screen colours for different problems.

YELLOW- A yellow screen generally means that an unidentified interrupt has occurred early in the initialization cycle, typically from a memory configuration problem. Double check the number of 1MBx8 sections and then be sure that jumper blocks **A1-A2** and **B1-B3** are set correctly, and check the amount of AUTOCONFIG memory against the total amount of 16-bit memory present in the system. This can happen from switching the computer on and off too fast; switch off the Amiga, count to ten, and then switch it back on.

RED - There are two red screens to know about: a bare red screen, before any other initialization, and a red screen usually with it a small requester - a **"BAD BOARD"** error. **Bare red screens** are usually a ROM-failure error. "Bad Board" screens can mean Zeus isn't plugged in properly and isn't AutoConfiguring - try reseating the board. If it persists, there could be a 16-bit RAM board causing the error (see **A LAST WORD ON MEMORY, PAGE 5**); remove the suspect RAM card and see if the error still occurs. If the error still does occur, the next thing to check would be power consumption. TBCs, extra hard drives and expansion cards all draw a considerable amount of power, so try removing them one at a time and re-powering up the computer to see if it will boot. If it still fails, contact us at Progressive and ask for Technical Support.

BLACK -A black screen can come from not using a genuine COMMODORE v2.04 ROM; be sure that it says 2.04 on the chip, as earlier 2.0 versions are not compatible. If the ROMs are indeed 2.04, and it is still black, contact Progressive and ask for Technical Support..

SLOW '040?

Does your Zeus seem to be running slower than it should? There are a number of factors that could cause this, some of which are easy to fix:

- SOFTWARE INCOMPATIBILITIES - Running some programmes will steal CPU cycles making the system appear to run slower. These programmes may not be *Copyback* cache compatible or may be looking for a physical floating-point unit. In some cases, running these programmes will crash the machine. **SETCPU** and an early version of the **CPU** command in **AMIGADOS** 2.04 are two of these. Programmes which accompany other accelerator cards or hard disk controllers may also fall into this category.

- SLOW DRIVE ACCESS? - Check that your MASK VALUE (**FILE SYSTEM, P16**) is set to run **FFS**; the MASK VALUE should be set to **07FFFFFE** for optimal speed.

- 68040 SETUP - If the 68040 caching is not turned on, the 68040 is robbed of its speed. Turning off *Copyback* alone will decrease '040 speed by 40% - 50%. Make sure your installation is correct and that you are using the proper version of SETPATCH (37.34) to avoid cache-related slow downs. If you're not sure about your version of SETPATCH, just copy the version off of our disk into your C: directory and reboot.

FLOATING-POINT NOTES

The 68040 microprocessor is both an integer and a floating point processor. The 68040 "on-chip" floating point unit does not include all of the FPU instructions that are available in the 68881 & 68882 math co-processors; it has about 60% of the most-used functions, but some of the more esoteric functions are emulated as "off-chip" instructions in software. This emulation is provided by the FP040 programme on your distribution diskette. It is the standard floating-point emulation package provided by Motorola, with some minor Amiga-specific alterations.

According to Motorola, the emulation was to be at least 2 times faster than the 68882 math co-processor; unfortunately, in implementation it has been discovered that the emulation of "off-chip" instructions was actually slower than the 68882. These "off-chip" instructions are mostly transcendentals (sine, cosine, etc...), and programmes that use only these instructions will possibly run slower than a 68030 and 68882 combination. This problem exists for ALL 68040 products currently available, and soon to be available, for the Amiga and for other 68400-based platforms. In actual practice with existing software on the market, the 68040 outperforms the 25/28/33 MHz 68030 & 68882 by 3-5 times; this is due to the extreme speed increase of "on-chip" floating-point instructions. Most software, including modelers like DRAW-4D, IMAGINE and 3D PROFESSIONAL, and other similar products use mostly "on-chip" instructions; you should see a significant speed increase when using these programmes.

Some software, mostly demos and benchmark programmes, will show a slight decrease in speed when compared to the 68882. If the floating point version of a particular programme doesn't run as fast as you expected, try running the integer version; because the integer version doesn't make use of the floating-point instructions, some programmes may actually run faster than the floating point version, if only through sheer brute force.

SETPATCH AND THE WORKBENCH 2.1 BETA

Somewhere, somehow, someone in this wide world got hold of a beta copy of WORKBENCH 2.1. While a nice improvement over the existing version (2.04/.05), it should be remembered that it is a **BETA** version, still in testing, and prone to bugs that usually don't occur anywhere else. Well, surprise! - there's a bug in the WB2.1 Beta version of SETPATCH, and it can cause the system to not fully initialize all the caches properly. This will cause parts of Toaster software not to initialize, and will usually cause LIGHTWAVE to crash. It's simple to get around this, but know that Progressive Peripherals does not condone nor support using Beta 2.1, or any Beta version, of WORKBENCH. First, change the SETPATCH command in your S:STARTUP-SEQUENCE to:

```
C:SETPATCH >NIL: NOCACHE
```

This shuts off the cache before anything is bound. Then, later on in the S:USER-STARTUP, you should turn the caches back on by adding this line anywhere in the file:

```
CPU CACHE
```

This should get the '040 recognizing both caches, but obviously the "final fix" is to just go back to 37.34 until WORKBENCH 2.1 is finished.

SYQUEST PROBLEMS?

If you've just installed a SYQUEST external drive and the system is crashing, it's very likely that you're running the wrong version of **SETPATCH.** This is especially likely if the SYQUEST was installed last, as it installs v37.10 (an older version) of SETPATCH as standard issue in the SYQUEST setup. Just insert our disk in DF0:, enter a **SHELL** and type this:

```
COPY DF0:C/SETPATCH TO C:
```

This will copy the latest version of SETPATCH to your system. You should reboot the machine and allow the system to re-initialize using the new SETPATCH. Depending upon which version was installed, there may be a slight delay as the hard drive validates itself.

NEWTEK'S VIDEO TOASTER AND THE ZEUS

The VIDEO TOASTER has been successfully tested under Amiga WORKBENCH versions 1.3.2/3 and 2.04, but things are changing. Since WB 1.3 doesn't directly support a 68040 and NEWTEK has stopped upgrading TOASTER software ver. 1.3 (instead moving on to 2.0), we will no longer support new systems running WB 1.3 and TOASTER software. **As such, WB 2.04 and TOASTER VERSION 2.0 should be considered the only real solution.**

- *AMIGADOS 2.04*

The VIDEO TOASTER software has just recently reached version 2.0 and is now AMIGADOS 2.0 compatible, if not required. Currently, if you use TOASTER software 2.0 with WB 1.3, you will find that you cannot save scenes in LIGHTWAVE 2.0 - the machine will crash and you will have to reboot. This is a LIGHTWAVE/040 bug, but it doesn't exist if you use WB 2.04. With 2.04, there should be no need to switch in and out of *Copyback* mode, as was the case in WB 1.3, but if you are experiencing occasional crashes when entering LIGHTWAVE, and you have upgraded from the standard 2000/040 card, you may still have an old version of PPI040.LIBRARY. Reinstall the software to be certain that the correct libraries are running. As software is upgraded, you will be notified automatically by mail. As well, all support software is available directly from our BBS (see **PAGE 45**); stop in anytime and let us know what you think.

If you installed the TOASTER software before adding the '040, you don't have to reinstall the whole package again - just re-run **AUTOHUE**. This programme checks internal and external system timings and produces a file to get the TOASTER to sync-up.

- *FLOATING-POINT LIGHTWAVE*

When loading **LIGHTWAVE** from **SWITCHER**, the VIDEO TOASTER software physically checks the system for a floating-point unit (FPU), such as a 68881 or 68882. If can't find one of these chips, it loads the integer version of LIGHTWAVE instead. Since the FPU is built into the 68040, Switcher can't find a 68881 or 68882 and loads the wrong version of LIGHTWAVE! You can cause SWITCHER to load the floating-point LIGHTWAVE by renaming it. Follow these simple procedures:

1. Through WORKBENCH, open the **TOASTER** drawer.
2. Select the **LIGHTWAVE** file and rename it as **LIGHTWAVE.INT**, for INTEGER version
3. Then select **LIGHTWAVE.FP** and rename it as **LIGHTWAVE.**

This will force the SWITCHER to load the floating-point version of LIGHTWAVE automatically. The same procedure can be used on the MODELER programme.

TECHNICAL SUPPORT

The Progressive Zeus represents the finest engineering and manufacturing available in the Amiga marketplace. But as you know, anything in life can happen, from a software error to a Democrat in the White House. If one fine morning you turn the system on and strange things happen, consult our ***TROUBLESHOOTING*** section beginning on **PAGE39**; it will walk you through diagnosing the error and solving the problem quickly and easily.

Of course, you can reach our technical support staff at:

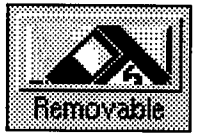
+01 (303) 238-5555
MONDAY THROUGH FRIDAY,
9 A.M.- 5 P.M. (MOUNTAIN TIME)
FAX: +01 (303) 235-0600

You'll need to go through all these steps so we can help diagnose what element is not running as it should; make notes as you go because diagnosing a computer over the phone isn't as easy as it sounds.

As well, we have a 24-hour BBS service for our entire product line. There you'll find the latest in our software support, news on compatibility issues and direct support from the engineers who create all our hardware. Also, you'll find users who have added to our collective knowledge with their experiences, always ready to lend a helping hand.

THE PROGRESSIVE VISION
(303)238-6326
2400, N 8 1 (24 HOURS)

REMOVABLE MEDIA DRIVES



Over the months of development there have been many inquiries as to whether Zeus would support removable media drives. The answer is - *of course!* Zeus will support SCSI-I drives like the SYQUEST and SCSI BERNOULLI subsystems, as well as the new high-speed SCSI-II magneto-optical systems. Obviously the newer SCSI-II drives are preferred, as the speed of the newer removable closely approach most SCSI-I hard drives. In the HDTOOLS drawer on your Zeus disk, you'll find an icon called **REMOVABLE** - this is the driver for most SCSI removable media.

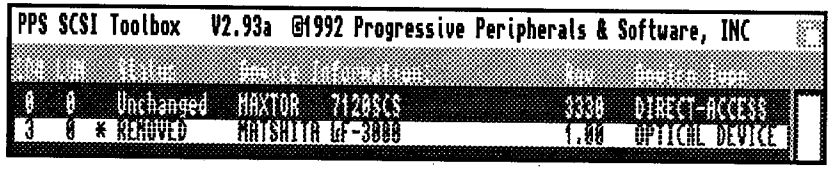
If you are running WORKBENCH 2.04 and above: Place the icon **REMOVABLE** in the **WBSTARTUP** drawer and **reboot**; upon startup the device driver will execute and patch the system.

If you are running WORKBENCH 1.32: Place the icon **REMOVABLE** in your 68040 drawer and add this line to the STARTUP-SEQUENCE before BINDDRIVERS:

```
SYS:68040/REMOVABLE >NIL:
```

The removable media will show up in **TOOLBOX** as having an asterisk before the *Status* column - this means only that a removable device ispresent. Treat the device as you would any hard disk: low-level, partition and install the drive as described on **PAGES 12-20**.

The removable drive may occasionally read as "**:BAD**" on the WORKBENCH; this is caused by the AmigaDOS being occasionally unresponsive. Usually, just reinserting the removed disk or inserting a new disk automatically mounts and makes the drive available, erasing the "**:BAD**" statement. Basically, just ignore it.



ZEUS JUMPER SETTINGS

CARD CONTROL JUMPERS:

AUTOBOOT ZEUS:	A3
ENABLE	▶ [▮]
DISABLE	[ ]

MACHINE TYPE:	B4
A2000	[▮]
B2000	▶ [ ]

BOOT PRIORITY:	C2
68040	▶ [▮]
68000	[ ]

CACHE CONTROL:	C3
ENABLE	▶ [▮]
DISABLE	[ ]

BURST CONTROL:	C4
ENABLE	▶ [▮]
DISABLE	[ ]

JUMPERS EXIST FOR 3 PURPOSES:
1.To set up the amount of RAM,
2. To address the RAM at the correct speed, and then,
3. To initialize the card and get the system running.

Once set, the BOOTPRIORITY, AUTOCONFIG, AUTOBOOT and MACHINE TYPE jumpers should never need to be changed.

MEMORY SPEED JUMPERS

MEMORY SPEED (28Mhz):	D1	D2
60 ns RAM	[▮]	[▮]
80 ns RAM	[ ]	[▮]
100 ns RAM	[▮]	[ ]
UNDEFINED	[ ]	[ ]

MEMORY SPEED (33Mhz):	D1	D2
UNDEFINED	[▮]	[▮]
60 ns RAM	[▮]	[ ]
80 ns RAM	[ ]	[▮]
UNDEFINED	[ ]	[ ]

▶ = DEFAULT

MEMORY CONTROL JUMPERS

AUTOCONFIG MEMORY:	A1	A2
0 MB CFG	[▮]	[▮]
2 MB CFG	▶ [ ]	[▮]
4 MB CFG	[▮]	[ ]
8 MB CFG	[ ]	[ ]

NUMBER OF 1MBx4 BANKS:	B1	B2	B3
0 BANKS	[▮]	[▮]	[▮]
1 BANK	[ ]	[▮]	[▮]
2 BANKS	[▮]	[ ]	[▮]
3 BANKS	[ ]	[ ]	[▮]
4 BANKS	[▮]	[▮]	[ ]

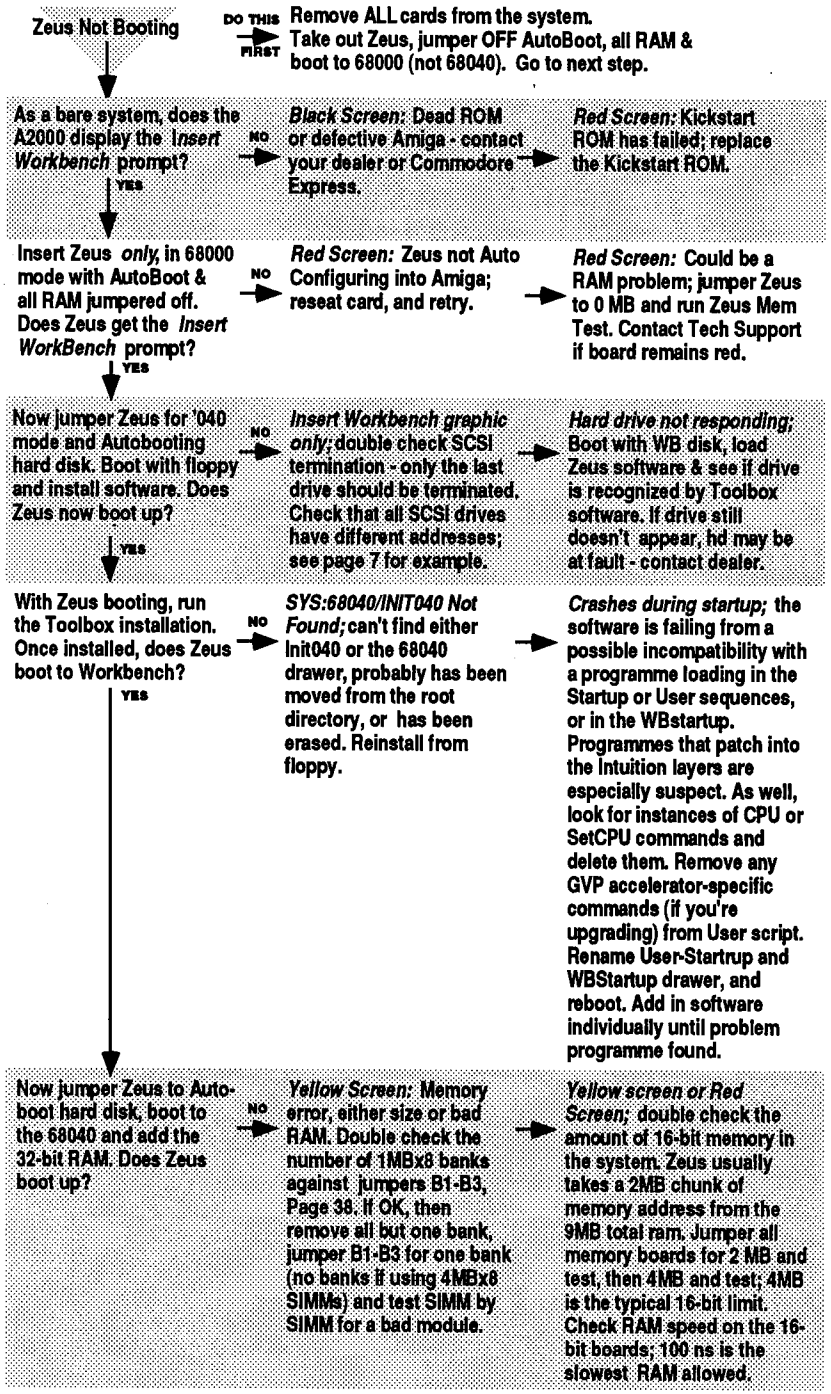
TROUBLESHOOTING FLOWCHARTS

TYPICAL INSTALLED SYSTEM PROBLEMS

Symptom	Course Of Action
No function, Black screen	Possible bad ROM problem; see if system will boot without card. If not, call Technical Support
Bare Red screen (no text or graphics)	Probable Bad ROM initialization - remove Zeus and double check if system still fails
Red screen (WB2.04 Bad Board error)	Reseat card and retry; if red screen continues then remove all other cards and hardware - add in Zeus, test, add other cards, test - continue until problem card is found. If still red, call Technical Support
Yellow screen, doesn't boot	Memory Error, either the wrong configuration set on Zeus jumpers or too much 16-bit ram in the system. Check jumpers. Remove all extra ram boards- set Zeus to 0 RAM, then run Zeus MemTest to identify bad RAM simms on Zeus. Can also be caused by older RAM boards with 120ns- 150ns ram
Boots, then fails with "Unknown Command 'Init040'"	Improperly installed software *68040* drawer should be in root partition of hard drive and *not* inside any other drawer. "Init040" could also be missing; reinstall software from Zeus floppy
Boots, crashes on Init040	PPS040.library & 68040.library may be missing or corrupt; reinstall software. Check version of SetPatch for proper system version
Runs slowly, crashes often	Wrong version of SetPatch; reinstall from Zeus disk
Can't switch to 68000 mode	PPS040.library & 68040.library may be missing or corrupt; reinstall software. Check version of SetPatch for proper system version
CopyBack Mode off on bootup	Wrong version of SetPatch; reinstall from Zeus disk

When something doesn't work, the best thing to do is start from the beginning and consider every possibility. Above you'll find some simple steps to help in the debugging process; bear in mind that Zeus is not just a peripheral; it is now the main processor and just about every other card or add-in is subservient. The best way to be sure about compatibility is to install Zeus first and then add in everything else.

If you experience a problem with Zeus, it will most likely be either a configuration problem or a software installation problem. Review the section on 16-bit memory boards on page 6 for further details



Randomly crashes, sometimes during disk access; check version of SetPatch - it should be v37.34. Do not use v37.1, as it does not recognize the presence of a 68040, nor v38.7 because of CACHE bugs. See Pages 31-33, notes on CBMs' SetPatch and Syquest drives.

Also, could be a power supply problem. See the Addendum on page 43.

Yellow screen or Red Screen; check 32-bit RAM speed against jumpers D1 & D2, page 38. Could be a RAM problem; jumper Zeus to 0 MB and run Zeus Mem Test. Also, could be a power supply problem. See the Addendum on page 43.

Contact Tech Support if board continues to fail.

UMMM...THAT WASN'T IT. WHAT DO I DO NOW??

Ok, let's assume for a second that things aren't going swimmingly, and that the previous symptom chart didn't reveal anything. Since there are three different functions to Zeus, we just have to break it all down logically and look at what's happening. You don't have to be a rocket scientist to diagnose Zeus, you just have to "follow the flow" (and relax!)

Which brings us to this flow chart - if you ever have to call Progressive about a problem with Zeus, we're going to ask you to go through all these steps so we can help diagnose what element is not running as it should. As we've said before in the manual, 95% of problems are installation-based; not always just user error, but sometime a newly installed programme or hardware device can add something to the system that may not gel with the '040. Sometimes it's a hardware conflict; remember the 2000 is over 5 years old and we have to work within its limitations .

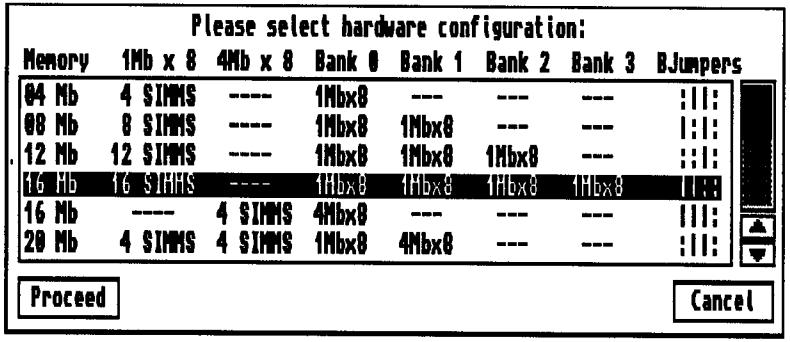
Just follow the flowchart on these two pages; it will logically step you through the debugging process, so that you can determine whether Zeus is having problems with software or hardware. We suggest that you make notes as you go, so that when we ask you what happened at a particular step, you can tell us exactly what we need to know.

Diagnosing a computer over a phone, blindly, can be tough, even for the manufacturer. So go slowly, cover every point, and who knows.. maybe you won't even need us (until it's time to upgrade again!)

ZEUS MEMTEST

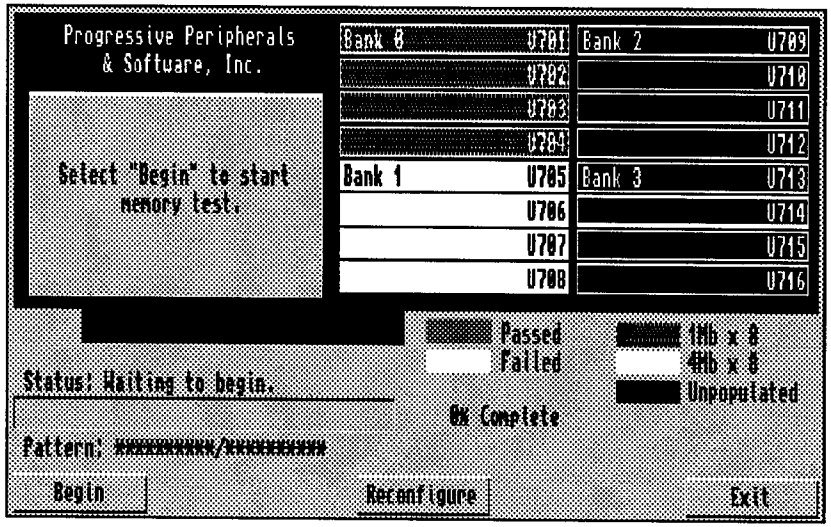
The **MEMTEST** is provided for your convenience to test each SIMM module thoroughly. After first-time installation, you may sleep better if you run the **MEMTEST** on your SIMMs to be certain they're reliable.

- Jumper **A1& A2 on**, and place a semicolon (;) in front of the **INIT040** statement, so that **NO MEMORY** is configured by Zeus.
- Run **MEMTEST** and select the amount of RAM (and type of RAM) installed in the system. Click **PROCEED**.
- Look at the RAM chart - if the RAM installed matches the chart,



click on **BEGIN**, otherwise click on **RECONFIGURE** and do the last step again. To perform a looping test, hold the **[SHIFT]** key down and click **BEGIN.**

- Let it run. If there is any bad RAM, contact your dealer.



ADDENDUMS

PROBLEMS WITH POWER

If your basic system worked fine with our card, especially for months on end, and then after adding a TOASTER, or a TBC, or perhaps an additional hard drive or two, or - like many of our "power users"- all of the above, and more. It's like the system has developed a shifting and unreliable personality of its own - much like a politician the week before the big election - you may have just overloaded your power supply.

Amiga 2000 power supplies are relatively strong units, and the 200 watt unit can generally do the job well, but some folks believe that a VIDEO TOASTER draws as little current as a RAM card, or that a 50MB drive can be directly replaced (or augmented) with a 400MB unit and the power supply can still deal with all this effortlessly. Often you'll find a random programme crashing, or data being trashed, or erroneous read-write errors that crop up seemingly on their own - this is all symptomatic of a power problem. General rule for power supplies: the more added to the system, the more stress applied to the unit, the quicker it will fail. And if it doesn't fail, it will go out of specification.

If you suspect an overloaded system, try removing all the cards from the system except for the Zeus. Once the system boots to the "Insert Workbench" animated screen, power down the Amiga, plug in your hard disk - *only.* If it works, power down the Amiga, add the floppy and try again. Then any more drives, then cards - do the adding in order of importance to your system.

Some people may need a TBC in the system, but an old 1988-ish 4 megabyte RAM board (using older, slower and hungrier RAM chips) may be consuming too much power for the general good of the system. See **PAGES 2-6** for more information on RAM. If you need ALL the boards and drives you now have, try an external drive chassis with a separate power supply. Hard drives and SYQUEST drives consume much of the power in a modern system,

and running them externally can add years to your power supply's life.

SYSINFO NOTES

Each Zeus is shipped with a public domain program called **SYSINFO**. This program is used by our Tech Support staff as a diagnostic tool when supporting our Zeus customers. However, not all of the functions of SYSINFO work properly. For instance, up until version 2.58, SysInfo incorrectly reports the status of the caches and the CPU clock speed. Even with these problems, SYSINFO is an effective diagnostic tool. Our technicians are aware of its problems and know how to interpret the information it provides. (The latest version of SYSINFO, as well as all our support software, is available 24 hours a day on our BBS - **THE PROGRESSIVE IMAGE** at **303-238-6326** [2400 N81]; just log in and get an update whenever you want!)

SOFTWARE UPGRADES

Previous versions of **INIT040** offered a fourth option: *FPU*. This option (usually run automatically in most older Zeus setups) installed a Progressive Peripherals-optimized floating-point library, in lieu of a finished Commodore version. Now that version 37.4 of CBM's 68040.library is available, we've changed **INIT040** to look for the new CBM library and avoid the FPU option altogether.

If you're using a version of INIT040 that still offers an FPU option, we suggest that you upgrade to the newer version.

To see if you are running an older INIT040 version:

- Open a **SHELL**
- Type **CD 68040**
- Type **INIT040 ?**

If the programme answers back with more than 3 options, you'll

need to upgrade your version of **INIT040**. Contact our BBS (**THE PROGRESSIVE IMAGE**: 2400 N/8/1) 24 hours a day at **(303) 238-6326**:

- Login
- Enter **U**, the **UPLOAD/DOWNLOAD** section
- Enter **2**, the **PPI PRODUCTS** section
- Enter **1**, **68040 SOFTWARE**
- Download the **68040.LZH** file

This is the complete 68040 install disk. If you cannot download the file, contact Technical Support.

Monday - Friday
9 am - 5pm
Mountain Time

REGISTRATION CARD

PLEASE COMPLETE AND RETURN THE ATTACHED CARD

SEND ONLY AN ORIGINAL REGISTRATION CARD - DO NOT

First Name: ______ Last Name: ______
Company Name: ______
Address: ______
______
City: ______ State/Province: ______
Country: ______ Postal/Zip Code: ______
Phone Number: ______ Serial Number: ______

Date Purchased: ______
Where Purchased: ______
Computer Brand/Model: ______
Other peripherals (hard drive, memory, printer, etc): ______
______

☐ Personal ☐ Professional

your Progressive 040 serial
above portion and
your manual for your
records.

Registration

040