Performance

To test the performance of the WarpEngine, I used the ''Diner-West'' scene from Brad Schenck's Diner LightWave Objects Set (Terra Nova Development). The scene has a lot of objects and a lot of reflective elements, so it is very math intensive. Resolution was set to medium with overscan.

	A3000	A4000	'040-40 WarpEngine*
No AA	10m24s	4m31s	1m34s
Low AA	35m55s	15m19s	5m22s
Med. AA	54m41s	24m17s	8m39s
Raytracing on:			
No AA	4h30m16s	1h10m33s	35m40s
Low AA	22h3m59s	5h51m39s	2h55m52s
Med. AA	not performed		10h5m40s5h4m37s

AA=Antialiasing, h=hours, m=minutes, s=seconds
* A3000 and A4000 WarpEngine performance identical.

As you can tell from the comparison tables, the 4000's speed is markedly improved. However, 3000 owners will think they've stepped into another dimension. Although both accelerated machines performed identically, relatively speaking, the WarpEngine transformed my aging A3000 into a fire-breathing monster! It is important to note that all system operations are speeded up, from reading directories to displaying graphics.

Although my hard drive couldn't take full advantage of the WarpEngine's SCSI controller, I was able to get up to four MB/sec sustained. The improved hard drive performance will help you to play animations smoother from disk, but the added memory will let you play large animations from RAM for super-smooth playback at maximum frame rates.

External SCSI

To access external SCSI peripherals you will need to add an external connector to your Amiga. The 4000 has a nice panel in the back that works perfectly. MacroSystem Development sells a 50-pin SCSI-2 connector ($49) for this purpose that connects to the provided internal SCSI ribbon. They also sell a version with the connector mounted on an expansion slot backplane for installation in a 3000. (If you don't have an open expansion slot, I guess you'll have to let the SCSI ribbon hang out of the case.)

Note that a SCSI-2 connector is not the same as the 25-pin SCSI connector on the back of a 3000. So you may also need a SCSI-2-to-50-pin Centronics cable. MacroSystem sells a deluxe mounting kit ($79) that includes the connector and this cable. All of this is standard SCSI hardware which you should be able to find elsewhere, if you are so inclined. (I'll forewarn you though that SCSI-2 cabling is somewhat of a specialty item currently and the price reflects it.)

The WarpEngine's SCSI controller was happy with my two 1GB hard drives, Exabyte Tape drive, and Syquest drive. My Sony DAT worked, but only if it was turned off when I booted. The only real problem I had was my NEC double-speed CD-ROM would not work at all with the WarpEngine. I may have been able to get it working, but I lacked detailed documentation for it.

There are several SCSI configuration jumpers on the board that may have to be adjusted to fit your system. I found I needed to set the termination power jumper (JP1) and my Toshiba hard drive required the slower SCSI setting to work reliably.
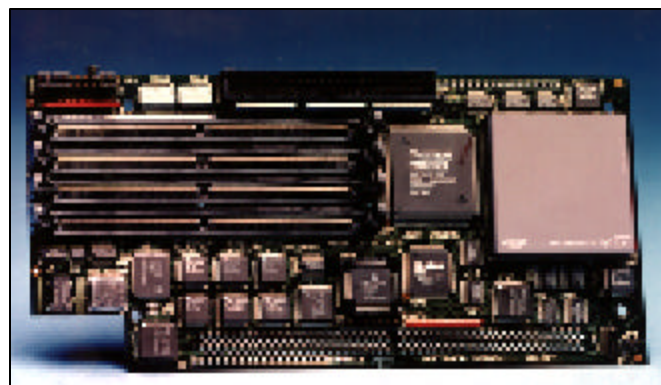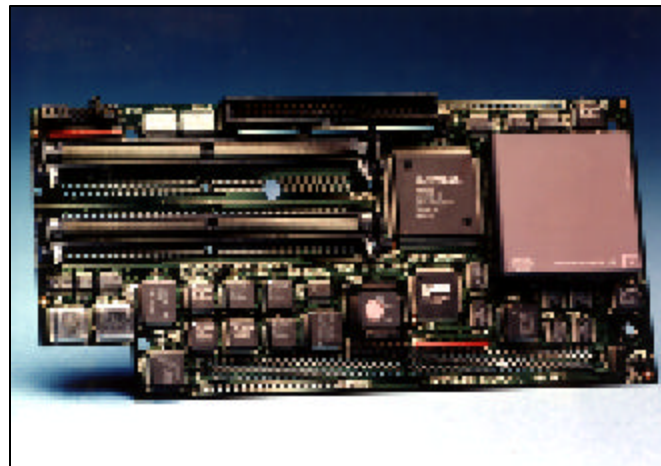
MacroSystem Development's WarpEngine 3040 (top) and 4040 (bottom) offers substantial improved performance.

Other Versions

The WarpEngine comes in 28MHz ($1150) and 33MHz ($1295) versions, which are upgradable to 40MHz. It will reportedly be upgradable to the '060 when that starts shipping. There is a version for the 4000 which allows you to transplant the existing '040 chip and motherboard RAM for up to a two-fold increase in performance ($899). Soon to be released is the 50MHz '030 ImpulsEngine for the 3000. This will double system performance and is expected to sell on the street for under $500.

Trade-in Offers

MacroSystem Development offers some very generous trade-in opportunities for owners of competing products. You can get a 40MHz WarpEngine for $600 if you trade-in a GVP G-Force '040. $500 and a Progressive '040 will get you one too, as will $950 and a Fastlane, 4091 SCSI, DKB 3128, RCS X-Calibur, or 3640 (the A4000-040 CPU card).

Conclusion

A4000 owners will realize substantial performance improvement, but A3000 owners will be taking a quantum leap forward. Whether you use your Amiga for 3D rendering, desktop publishing, 2D graphics, or any other purpose, you won't be sorry after installing a WarpEngine in your machine. It's a product that everyone with an Amiga 3000 or 4000 can benefit from--unless you already have one!

Accelerate Your A4000 or A3000

with MacroSystem Development's WarpEngine

By Douglas J. Nakakihara

The top-end of the WarpEngine line features '040 CPUs running at 40MHz which can triple the speed of a 4000 and improve a 3000's performance by a factor of nearly eight!

While working on a recent LightWave animation project, it became quite clear that my micro-rendering-farm, consisting of an Amiga 3000 and 4000, was decidedly inadequate. If I only had MacroSystem Development's WarpEngines installed in both machines, life in rendering-land would have been much more palatable.

The top-end of the WarpEngine line features '040 CPUs running at 40MHz ($1495). This can triple the speed of a 4000 and improve a 3000's performance by a factor of nearly eight! If that is not enough, the product also has a built-in SCSI-2 Fast controller.

Both the A3000 and A4000 WarpEngines are CPU daughtercards that connect to the special CPU slots on both machines. Because the SCSI controller does not have to communicate through the Amiga bus, you do not have to contend with the dreaded Buster chip problem that can occur with Zorro III expansion boards. This is also one of the reasons for its high SCSI transfer rate capabilities--with a Barracuda hard drive, MacroSystem is boasting transfer rates of 9MB/sec burst and 6MB/sec sustained. (The board is reportedly capable of 10MB/sec.) Plus you don't lose a Zorro slot, which is especially important to VideoToaster owners.

The WarpEngine is optimized to use standard 60ns 72-pin SIMMs, in any combination of 4, 8, 16, or 32MB modules. There are four SIMM sockets on the 4000 version and two on the 3000 board, so the maximum memory configuration is 128 and 64MB, respectively. You can use 70 or 80ns chips, but there will be a performance hit. Keep in mind that many of the animations you have seen on seaQuest DSV (Amblin Imaging) and Babylon 5 (Foundation Imaging) were created on Amigas with only 32MB of RAM. The RAM for one of my review boards was supplied by H. Co. Computer Products (800/RAM-CHPS). Lawrence Burkey at the company was exceptionally helpful and knowledgeable in finding the RAM I needed for the WarpEngine.

A4000 Installation

Installation in the 4000 is straightforward and the instructions are very good. All you do is set a few jumpers on the board to match your RAM and SCSI configurations, and swap the existing A4000 CPU daughtercard with the WarpEngine. I actually had the WarpEngine up and running in a half hour. (Getting the SCSI controller to recognize my SCSI devices took a little more time, which I'll talk about later.) Moving the existing IDE drive to the bay just below the floppy drive, as suggested in the manual, allowed me to install a full-profile 3.5-inch hard drive in its place. There is enough maneuvering room inside the case to change jumper settings and even add memory once the board is installed, without disassembling any part of the computer.

There are four plastic standoffs that hold the board above the motherboard. Pinching the ends of the standoffs with some pliers will make it easier to snap the WarpEngine into place. Commodore did a fairly good job at designing the 4000 and the only problem you may encounter is removing the case faceplate.

A3000 ROMs Required

The early Amiga 3000s, like mine, all came with Kickstart stored in a file on the hard drive, not in ROM. Unfortunately, running an '040 in an Amiga requires actual Kickstart ROMs. So I opted for the new 3.1 AmigaDOS ones, which I purchased from MacroSystem Development. The existing (so-called) ''magic'' ROMs on these 3000s are mounted upside down on a daughtercard which is plugged into the motherboard. You must cut a pair of plastic straps, remove the daughtercard, replace the ROMs, replace the daughtercard, and install the software. (Note: I recommend you make an orientation mark on the daughtercard before removing it.) Maybe I was lucky, but it worked flawlessly the first time.

If you are upgrading from AmigaDOS 2.x, delete all of the files in ENVARC:sys. These preference files are incompatible with 3.1.

A3000 Installation

Installing the A3000 WarpEngine is a little bit more complex than the 4000 installation. In addition to the same configuration jumpers on the WarpEngine, you must also set a few jumpers on the 3000's motherboard. There is also a clip you must attach to a pin on a CIA chip. This is the only place the instructions really failed me and probably exposed my ignorance. Anyway, a quick call to MacroSystem Development showed me the way. First look for the end of the chip with the dimple. The pin on the end immediately to the left is pin 1. Count counter-clockwise until you get to the appropriate pin, in this case number 21. Another way to describe it is if you are standing in front of the A3000 case looking down into it, pin 21 is in the upper right corner of the CIA chip.

The A3000 installation instructions are printed on separate addendum sheets. Although it says to install the provided plastic standoffs, my 3000 had two metal ones already in place. You should be able to get some screws to fasten the board down, but be careful, they are fragile. I broke one of them off, by tightening a screw too tight. However, I don't really think you need to screw it down, as the connector seems to hold the board in place just fine.

A helpful thing to do is re-drill two holes in the rear-bay hard drive mounting plate, so the drive can be placed with the connectors facing forward. This will make it easier for the SCSI ribbon cable to reach the necessary connectors. I also had to leave the right floppy bay open because the mounting bracket would hit the top of the '040 chip fan.