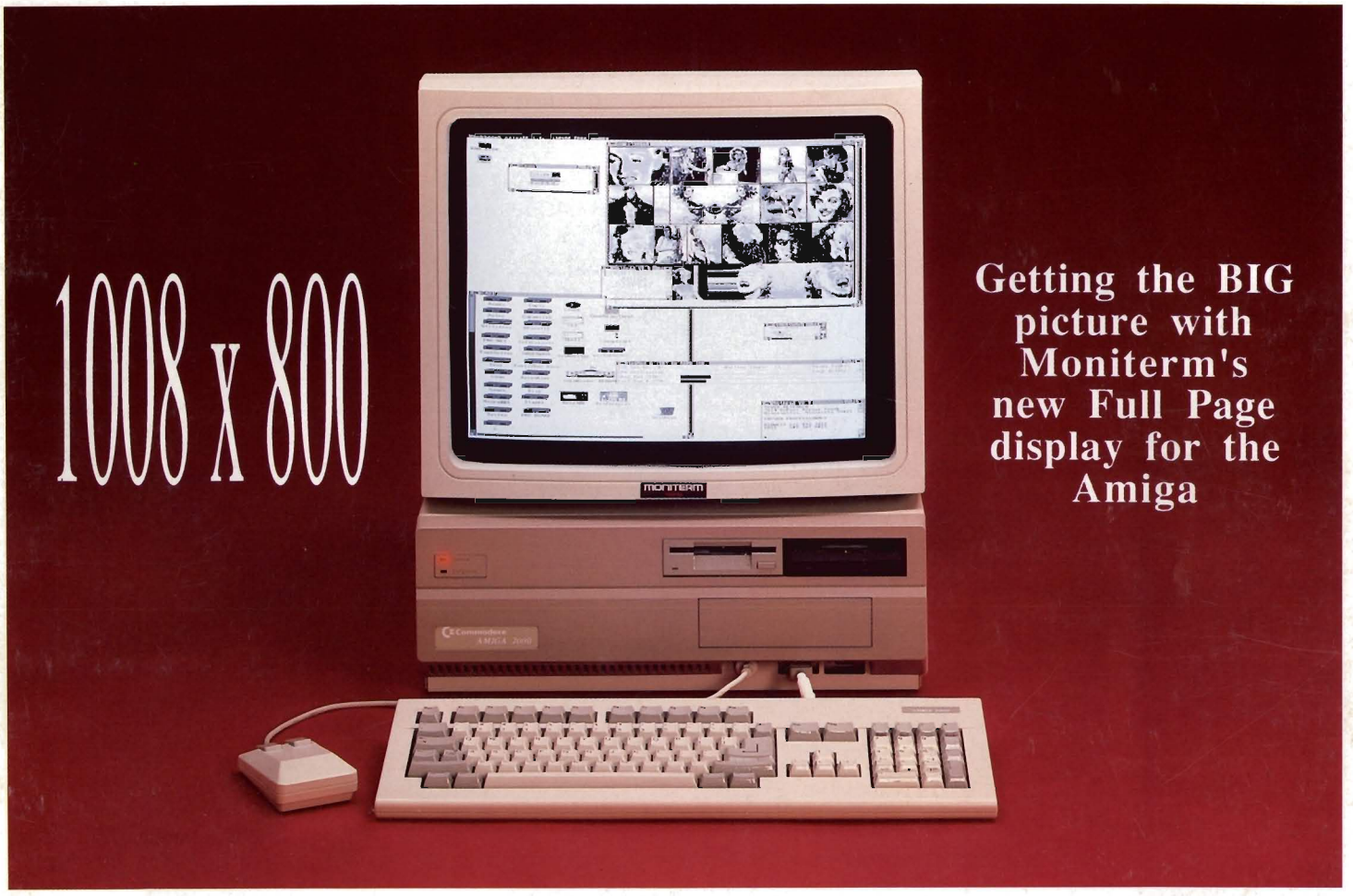
THE AMIGA SENTRY

THE AMIGA® NEWS MAGAZINE

NOV. 88
U.S. $3.00
Can. $4.00



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Also in this Issue:
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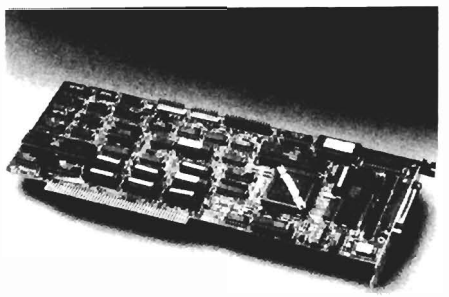

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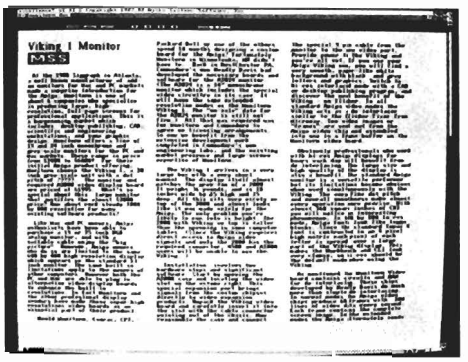

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The Amiga Sentry is published monthly by TAS Publications, 706 Old Marple road, Springfield, PA 19064. Subscription rate is $24.00 (US funds) per year in the US, $30.00 per year (US funds) in Canada. Phone (215) 544 - 6394. Entire contents of this publication are Copyright 1988 by TAS Publications. No use of content for any reason permitted except by the express permission of the publisher. Second Class Postage paid at Media, Pa. Postmaster: Send address changes to The Amiga Sentry, 706 Old Marple Road, Springfield, Pa. 19064. "Amiga" is a registered trademark of Commodore-Amiga, Inc. The Amiga Sentry is not affiliated with Commodore-Amiga, Inc. The Amiga Sentry and TAS Publications assume no reponsibility for damages due to errors or ommissions.

On Point

Notes from Editor, Tom Bucklin

I was just scrambling around looking for all the various things that one has to assemble when you have to go out of town. On this trip, I'm headed for Ami-Expo, Los Angeles. The last time I was in LA it was the middle of January. I stepped onto the plane at Philadelphia International Airport, bid a quick farewell, and headed for the fair West. The only trouble is when I got there they had a daytime high of 60; accompanied by floods (did you ever get the feeling they knew you were coming?). And the strange part about all of this is the native LAer's seemed to want to tell you just *how* unusual it was that they would *ever* have this kind of weather. It's like they were apologizing for the weather not being as ordered.

During that month, and again at the Chicago Ami-Expo in the summer, a number of products were discussed and shown for upcoming release. Unfortunately, some of those products are still in the development stages. However, my prediction is that you will start to see alot of these products cut loose during a late October - mid November time frame (it's amazing how fast things can move when you risk the possibility of missing the Christmas buying season).

We've been able to put our hands on some of the newest products, and a number of them appear in this months issue. The official release of Commodore's 1.3 OS certainly leads the pack as the most significant of these. With the new operating system, we were able to bring you the related review of Commodore's new 2090A autobooting drive controller card. It looks like things are really starting to materialize up at the big "C."

If I get started about all the great news in this issue, I'll probably take up half the review space. Instead, just go ahead and dive on in.

Now, where is that travel bag?

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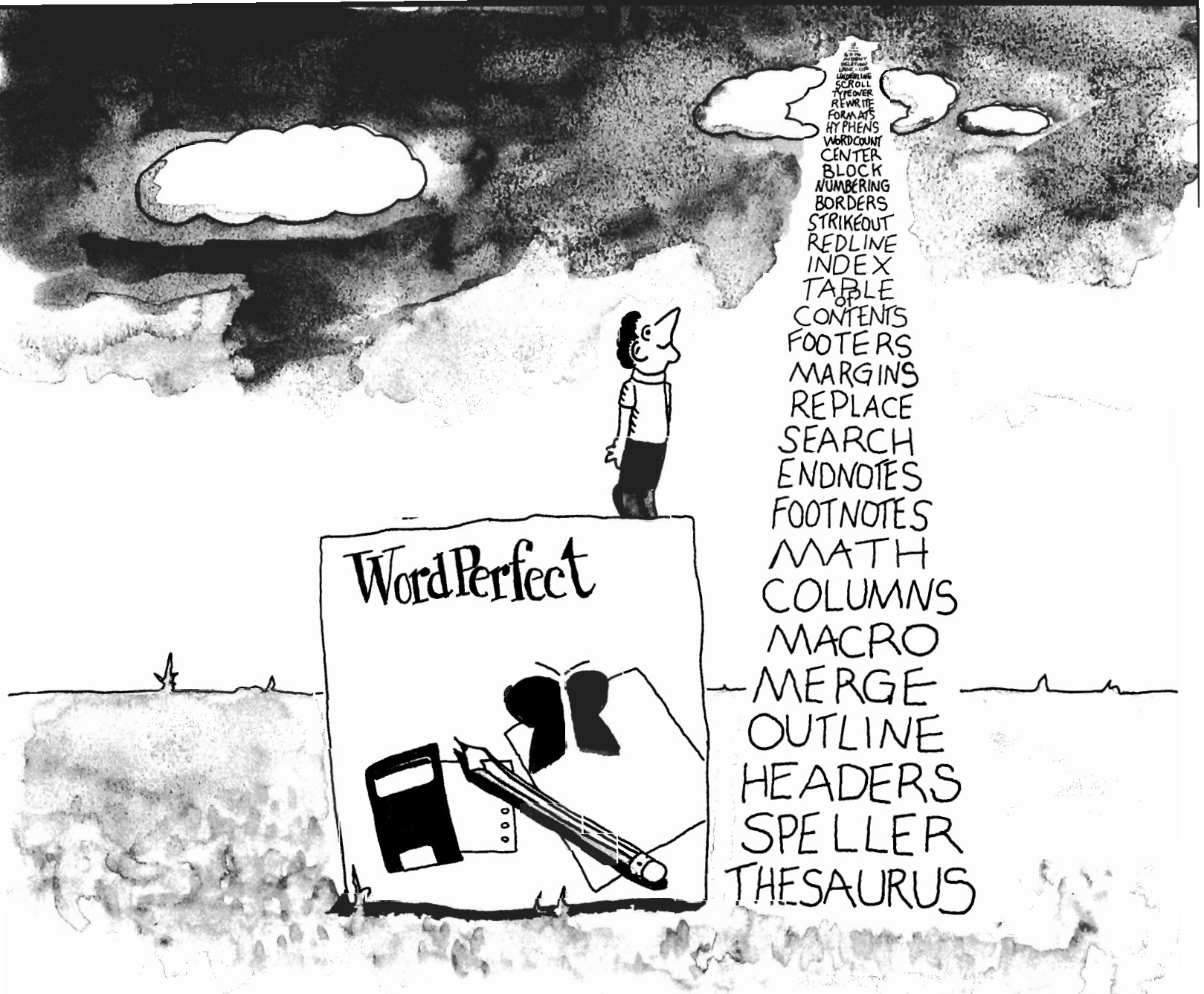

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From the Frontline:

Video Expo - New York

The Video Expo - New York, NY

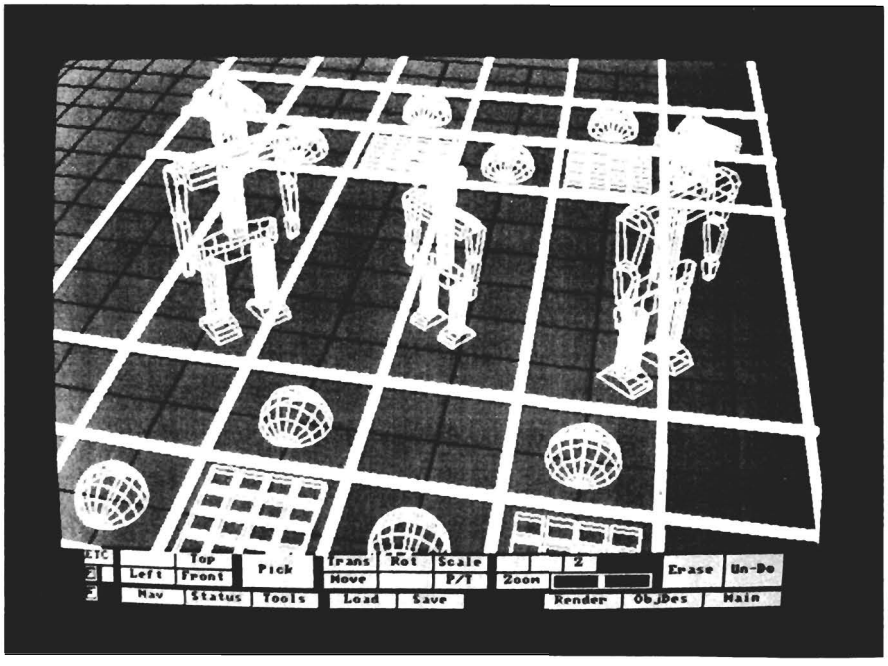
by Tom Reed and Steve Dock

Jacob Javits convention center in Manhattan is the site of many conferences and trade shows. Not surprisingly, AMIGA computers and products show-up at quite a few. In September, the Video Expo was held at Javitz. This is a trade show sponsored and aimed at professionals in the field of video production and broadcast. At Video Expo you'll find booths for Sony, Panasonic, JVC alongside magazines like Corporate Video Decisions, AVideo and Video systems.

If you want to see an exhibit floor filled with editing equipment, professional video cameras, cases, effects generators, genlocks, etc, this was the place to be. Most of the attendees work for corporations, colleges and small video studios. We did see an occasional name badge with ABC on it, but the bulk of interest is for commercial and local video rather than network TV.

We were in the big apple to attend this show since several Amiga developers and dealers were exhibiting. Amiga at a professional video expo? Yes, and 1988 was the second year for Infotronics, an Amiga VAR who specializes in providing video systems. Based about 60 miles from Manhattan, in Woodbury CN, Infotronics serves video professionals from around the country. They were exhibiting two A2000's and drawing crowds throughout the day. At one workstation an artist was using DigiPaint to produce art suitable for broadcast on CATV. At the other, character generation over background video was demonstrated. An A2000, low end GenLock, and ProVideo CGI package was being offered for $2695 complete. This compares for $10,000 and up for low end Chyron dedicated character generators. Infotronics personnel are knowledgeable and experienced in the Amiga and video. Their literature described 6 different genlock units which are now available for Amiga video practicioners; AmiGen from Mimetics, ProGen from Progressive, SuperGen from Digital Creations, and three

The high powered "Caligari" calculates the lighting for the objects, and ...



newcomers. At the booth was "the only working example of the Commodore A2300 genlock" outside of WestChester. This new unit is was joined by a first SuperVHS unit, S-Genkey from Scitech Corp. It provides seperate inputs for the components of SuperVHS and is reported to be the first of its kind for Amiga.

Gen/One by Communications specialities was also recommended by Infotronics. It uses a seperate power supply to minimize interference effects. While we watched, several attendees placed orders for A2000 systems with little hesitation. The first Amiga booth confirmed what we had heard, the Amiga is a recognized and accepted tool in the professional video community.

Another Amiga dealer, VAR and developer who attended Video Expo was RGB Video Creations. They travelled all the way from Palm Beach, Florida with the famous Video Wall and AmiLink. Best known for their Deluxe Help series of software, the folks at RGB are really video professionals. AmiLink can connect and control a wide range of video equipment, from 1/2", 3/4" to Super VHS. It uses a multitasking, user friendly interface to let a producer set up a series of edits and effects from various video sources to the finished product. These are previewed in realtime and saved as you go. Finally, when all the fades, wipes, etc. are just right, press the button with confidence. The finished product will be precisely as desired.

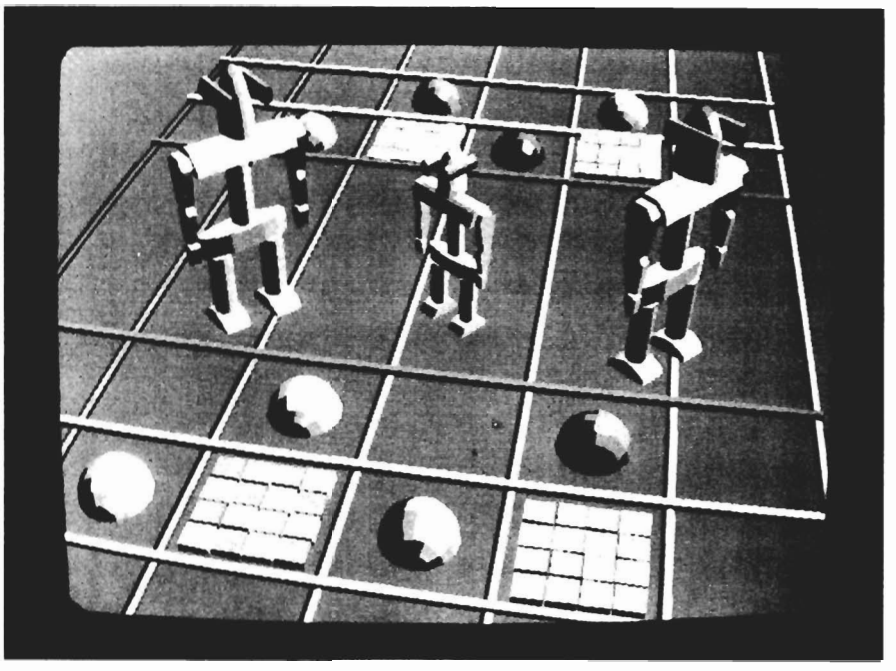
The Expo attendees were thick in this large booth also. Rod Molina of RGB patiently demonstrated a degree of control and ease of use which would cost $100,000 and more to purchase elsewhere on the floor. The last Amiga VAR developer on the exhibit floor was Shereff Systems. They are better known as JDK Images, the producers of ProVideo CGI. They travelled all the way from Beaverton, Oregon to show off their character generation software. They, too, sell and support complete video systems packaged with everything a professional needs. These systems are based on the A500, and range in price from $1395 to $3495. ProVideo CGI has just added another set of fonts bringing the total available to 68! They showed a timely demo featuring "Olympic" results and backgrounds.

Commodore was also exhibiting at Video-Expo. A forty foot booth housed several developers and Keith Masavage. Keith was formerly a principal in ACS and is now Amiga Product Manager for Commodore. ACS develops the TV Station Manager series of products and developed Deluxe Productions for EA. In the Amiga booth was the Weather Station from ACS, TV Text and TV Show from Brown-Waugh, and Caligari from Octree Software. The video professionals probably focused on the Weather Station, which can download ACCU Weather graphics and combine them with Titles to make a local weather reports, but we were struck with Caligari.

Octree shook the Amiga community two years ago with the beginnings of this same product. It was the first 3D animation software for the Amiga. Now two years later it is finally on sale. Roman Ormandy has spent that

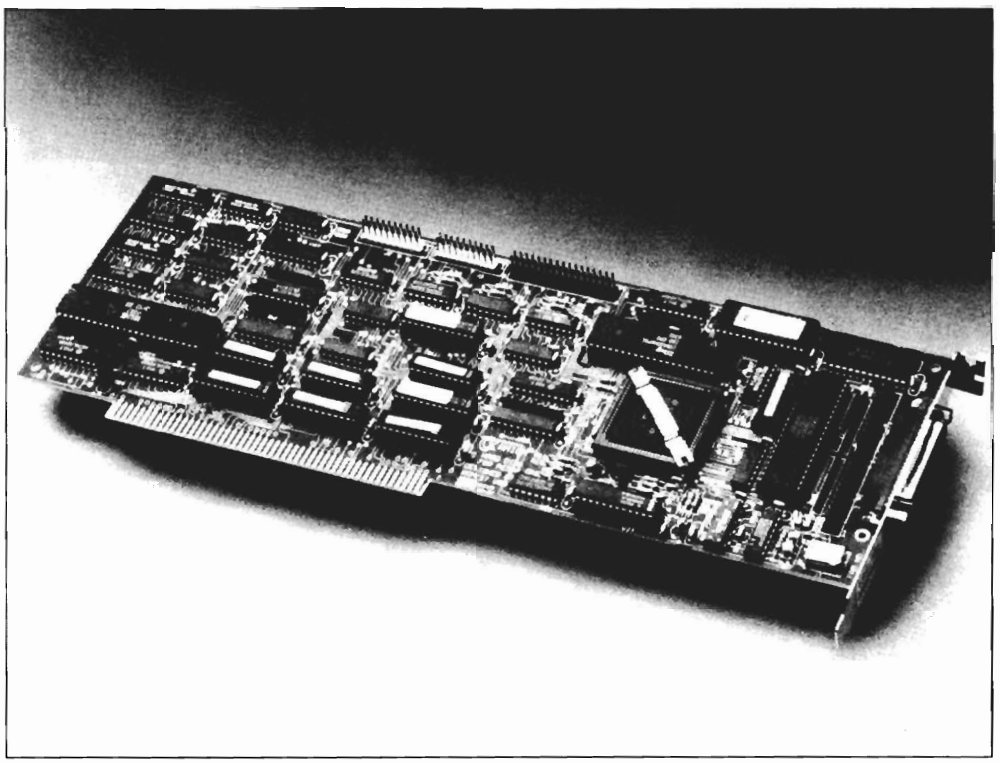
(continued on next page)

...renders a scene consisting of many shaded objects



Video - Expo *(continued from previous page)*

time developing the most fluid and interactive 3D modeling interface we've ever seen. You build objects, scenes, and motions dynamically using wireframe representations. There is no bothersome tri-view, just a realtime accurate 3d perspective. Using the mouse you can clone, rotate, scale, join, and move one of many primitive 3D objects. You can also change the observ-



Commodore's newly designed 2090A board supports a variety of hard drives and adds autobooting capabilities

ers point of view just as interactively. Want to see the view from below your objects? Just drag the mouse towards you. The rendering of the objects does not use ray-tracing, but is impressive and quick.

Caligari renders a frame at a time to a single frame recorder. It is intended for professionals who need to turn around an animation in 24 hours. With a price of $1995, it is the most expensive Amiga software extant. Octree is working with Electronic Arts to produce a consumer version of Caligari, which concentrates on 3D modeling and producing IFF frames.

The impact of the Amiga in the professional video market is real and growing. The selection of animation, 3D modeling, titling, special effects, paint, CAD, and scripting software is unequalled. Add the special video editing software from RGB and Amicore, and you've got a winner. Now consider six or more Genlocks, two frame grabbers, and a frame buffer, and you can see why Commodore was present. For the next six months, the Amiga is *the* Video computer.

AMIGA PRODUCT UPDATE:

In the March issue of the Sentry, we reported on several new products which were officially announced by Commodore. Most of these were scheduled for first shipment in late summer or early fall. Well, it's fall, and many have actually arrived. The most awaited product is probably Workbench 1.3. This enhancment of the existing WB emphasized improvements in printing, support for more printers, a new Fast File System, and many new CLI commands.

Although the printer.device, new preferences, and printer drivers have been distributed with Shakespeare, Excellence, Professional Page 1.1 and others, the complete version has been held up for some time by interactions of the FFS with a very few programs. WB 1.3 is scheduled to ship in the first week of October.

In September, the first batch of Kickstart 1.3 ROM chips were available from Commodore Service centers on a very limitied basis. This new Kickstart only adds the capability to autoboot from harddrives, networks, etc. All other libraries are identical with Workbench 1.2. Commodore will make these ROMs available only through authorized service centers. They must be ordered as parts, not new products. The production of Kickstart 1.3 is tied closely to the release of the 2090A autoboot controller.

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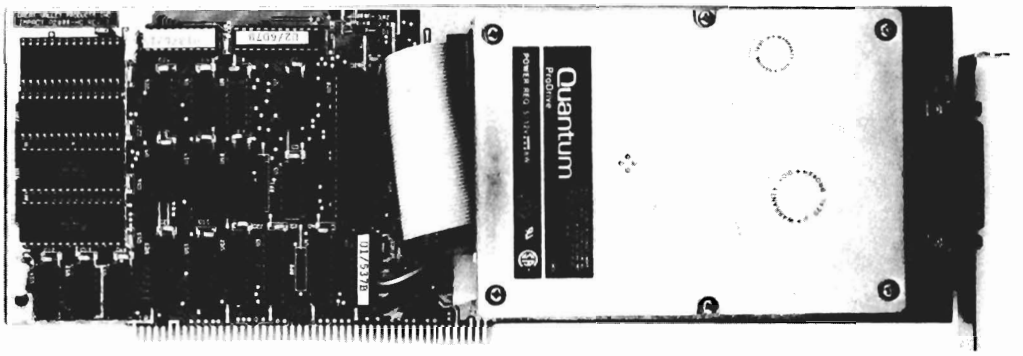

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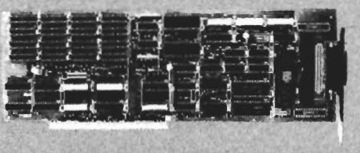

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A2090A: The West Chester Autoboot Controller

The 2090 was Commodore's original controller card which supported up to six ST506 and SCSI harddrives. It has been redesigned with fewer chips and additonal sockets for the autoboot ROMs which are needed for this function to work. We recently recieved acquired a production 2090A along with Kickstart 1.3. Installation of the Kickstart chip requires quite a bit of disassembly. You must first open the A2000 case as usual for expansion. Next the power supply must be removed. This involves several screws and a few snap together plugs. Finally the Kickstart Rom chip must be located and pryed up from the motherboard. Great care must be taken so as not to score the motherboard underneath the Rom socket. The KickStart Rom is a 40 pin chip takes quite a bit of force when removing. If you have access to a chip pulling tool, the job is much easier and safer. After pressing the new ROM in place, reassemble and you're ready to Kickstart 1.3.

The 2090A is a snap to install by comparison. With the 2000 case still open, insert the board into an open Zorro slot. Now connect a 50 pin ribbon cable to the 2090A connector. This cable will run to the back of the harddrive you select. The final connection is from the 2090A to the disk light on the front of the 2000 case. This two wire cable terminates in small black plugs at each end. Check all your connections and test your installation by powering up before replacing the case screws. If all went well, you'll be greeted in a few seconds by with the "whirr" of your harddrive and a Workbench screen (this, of course, assumes that you are replacing the controller and have added Kickstart 1.3). With your custom Startup-Sequence, you can now boot directly from power-up to your most used application.

It seems like a simple thing, autobooting. Only a minor inconvenience to insert a floppy when you start a day's work. But like the hard drive itself, once you have Autoboot, you'll wonder how you worked without it. The autoboot process involves both hardware and software. Each hard drive must first be a proper autoconfigure device. This means that PAL's or ROM must be included which identify the address at which the device operates.

The autoconfigure code for any device is limited to 64K. This standard has been documented for quite a while, and supports memory and diskdrives. When the Amiga boots, the boot routine searches its expansion ports for the presence of autoconfigure code. If it finds the proper pattern of bits, it looks carefully for one particular bit set high. This is the boot bit and tells the operating system that a bootable device is present. The bootable device must also provide the offsett address to its boot code, and a boot priority. This code must also reside on the controller, usually in ROM. When the boot routine has finished searching for bootable devices, it passes control to the address of the device with the highest boot priority. In normal configurations, the df0: device will have the highest priority, so a bootable floppy will overide even the 2090A boot routine.

All this happens in a few seconds, and makes those occasions when a reboot is required much less annoying. Besides autobooting, the 2090A performs better with overscan modes of graphic software. This had been a serious problem with Aegis products which use "severe overscan." It seems that the DMA access of the 2090 conflicts with the DMA access of the graphic chip when in this extreme resolution. We welcome the arrival of the 2090A, along with the autoboot capability that the PC and MAC community have, at this point, taken for granted.

Other Products

The 2058 memory board is another add-in board for the A2000. It is a fully autoconfiguring Dynamic Ram card which can hold from 2 to 8 Megabytes of Memory. This board replaces the A2052 two megabyte board. By allowing the maximum amount of expansion RAM on one board, the 2058 frees up expansion slots for other add-ons. The 2058 uses 1 megabit by 1 Drams, which are not the type in short supply. The RAM shortage has caused prices to skyrocket, and has even trickled through to higher Amiga Prices (in September, Commodore officially raised the price of the A2000 to $2195 and the A500 to $799).

Unfortunately, the A2024 super hi-res monochrome monitor has not reached distribution yet, but a third party vendor has introduced a 19" monitor using the "Hedley"

chipset (see the Moniterm review in this issue). Another no-show is the A2080 hi persistance monitor. This unit is designed to minimize flicker in 640 by 400 interlace mode (our Canadian readers will find the A2080 is available in Canada). We have not heard anything further on the status of the 80286 AT bridgecard, which was announced in March.

The Professional Video Adapter, which was shown at the Spring Comdex, is still in preproduction. This unit will offer a genlock, frame-grabber, and frame-buffer all bundled into one (the frame-buffer will let video and graphics display more than the current number of colors once software is written to support it). There were two major announcements in Hanover which will have their US introductions in the next few weeks. The A2000-HD will be a standard A2000 with a bundled 2090A drive controller, Kickstart 1.3, and a hard drive. The hard drive will be a very fast forty megabyte unit with an 18 millisecond access time. This package will be priced aggresively as the professional version of the A2000.

The other "new model" is the A2500, which starts with the 2000-HD and adds the 2620 accelerator card. The A2620 is an expansion board which fits in the special slot reserved for coprocessors. It includes a 16 MHZ Motorola 68020, true 32 bit CPU, a 16 MHZ 68881 math coprocessor, and a 68851 MMU. The board also has space for 2 or 4 megabytes of 32 bit wide ram. With the A2500, you effectively replace the 7.14 MHZ speed of the standard Amiga with 14.2 MHZ, and a much greater increase in floating point calculations. We had doubts about whether the A2500 would be introduced in the US due to various marketing condiderations, and are glad that it will be.

With Apple introducing a 68030 based MAC II system, and Next scheduled to introduce its 68030 machine this fall, it would not be surprising if Commodore were to announce their own 68030 based product by the end of this year, as well.

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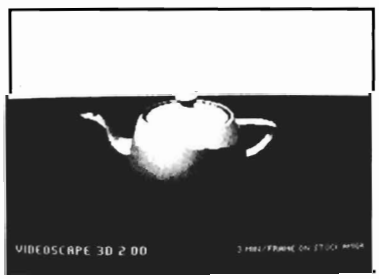

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Pow! Punch! and "Holy Chip Memory"

by Ed Fadigan

"Well Robin," explained Batman, "it claims to be a complete comic book production center. With built in characters and backgrounds, bit-mapped and structured graphics support, it'll have you creating full-color comic books in no time." "Holy chip memory Batman,what is it?"

It's ComicSetter, the complete comic design studio from Gold Disk Inc. Released the same year that we celebrate the 50th anniversary of Superman, Gold Disk is offering a DeskTop Publishing Program specifically geared towards the comic book enthusiast. With it, you can use your Amiga to create full-color comics, quickly and easily. You don't even have to be an artist, because Gold Disk supplies a wide variety of Clip Art with the ComicSetter, and also offers Clip Art Disks for you Super Hero and Science Fiction fanatics. ComicSetter comes on a single bootable disk, with everything you need to start creating your own exciting adventures. The disk includes a fair amount of fonts to use in your panels, and the Workbench 1.3 version of the printer drivers and printing system software.

Along with the ComicSetter program, you get a 100 page manual, peppered with cute illustrations of a Super Hero that resembles a cross between Dudley Do-Right and the Green Hornet in his pajamas. This documentation is straight-forward and very well designed. It's a good thing, because this package is a bit more than just a simple "cut & paste" program. When ComicSetter loads, it is displayed as a medium resolution screen in 16 colors. This can be modified into an interlace screen, thereby doubling the display area, but only if you've got some way to get around the "flicker."

I, personally would rather work in 640x200 and scroll around the page than suffer the headache of interlace. Comic-

Setter's set of Tools are presented as icons down the left-hand side of the screen, and are fairly easy to identify. ComicSetter includes most of the features that have become the standard with paint programs, like a Fill Tool, an Airbrush Tool, Text Tool and the like.

Some of the icons will switch to a related icon when clicked, and others will call up other options when double-clicked. These "double-duty" icons present a pretty decent amount of tools, without detracting from the display area that much.

In order to begin work, you must define a page. This will be the area in which your comic will print. It will usually be larger than the area your Amiga screen will display, and can be anywhere from a standard 8 1/2 by 11 inch piece of paper, to a user definable custom output size. The maximum page size is a whopping 1008x1008 pixels. Since you probably won't be able to see your whole page without scrolling around, ComicSetter comes with four different viewing magnifications, 200%, 100%, Full Page and 50%.

Once your page is set, you must create a panel. These are the rectangular boxes in which you'll place your backgrounds, figures and (hopefully) your storyline. As in traditional comic books, this is where the action happens. The panels are also user definable, and are made by dragging the mouse from corner to corner, "rubber-band" style.

You've got your first panel, you're ready to add some graphics. ComicSetter supports IFF graphics, and a separate disk full of IFF Clip-Art is included with your purchase. This disk contains many varied Backgrounds, Characters and Props. There are scenes like rooftops, building interiors, and alien landscapes.

A rooftop seemed like a reasonable place for a super hero to be, so I loaded one of those first. ComicSetter brings up the selected graphic into a separate window, so you can snip it out in proportion to the panel into which it is being loaded. Since your panels will rarely be the same size and proportion as a 640x200 screen, one medium resolution screen can be used for many different backgrounds. There are several gadgets placed in the title bar of this clipping window that allow you to clip out the art in several modes. You can use the rubberband mode or the "lasso" mode to point and click around an irregularly shaped object. It even includes a Disk Gadget to get back to the file requester in case that rooftop you loaded wasn't exactly what you had in mind.

After your background is placed in your panel, you can begin to populate your comic using these same tools. The heroes and villains that come with ComicSetter are finely drawn, but sparsely clothed. This is not only titillating, but quite advantageous. Like the backgrounds, you can edit them with ComicSetter's bit-map tools or another IFF paint program (you really don't have to be another Stan Lee of Spiderman fame to do this; if you're a com-

(continued on next page)

ics fan, adding gloves and boots, a different colored costume and other details should be fairly easy for you).

So, in effect, one character can become many. Add a cape, some pointy ears and a handle bar mustache to a character, and you've got an Arch Nemesis. Simply throw some horn-rimmed glasses on your Crime Fighter, and absolutely NOBODY down at the newspaper office will recognize him (why don't any of the evil guys ever use glasses like those? They were better than X-Ray vision if you ask me).

Once your characters are on the screen, they are still editable AND mobile. They can be picked up off of the background and moved, or perhaps re-sized to fit in a doorway. This is one of the features that makes ComicSetter different from a paint program. The program will keep track of the background behind your hero. In essence you're stacking the objects on the screen as you place them. If you think that your hero would be a bit safer behind the potted plant, no problem. Just select your character, and hit the "Switch To Back" gadget. Now that you've got your panel filled with people, it's important that they say something (unless your character is the Hulk).

Adding text balloons is another neat feature of ComicSetter. It lets you add the ellipsis for dialogue easily enough, but also allows you to grasp one of the definition points of the oval and drag it over to the character's mouth. The resulting "tail" is smoothly blended into the curve of the balloon, making a very professional looking piece of work.

Text is formatted into the balloon via a requester, and will justify right, left or center. The text can be entered as any mixture of plain, bold, italic or underline styles. About a dozen fonts are included, and the disk is so packed, there's no room to add any others. ComicSetter could use an option for switching to another disk for fonts. Balloons can be either oval or rectangular. You can even have those cloud-like thought balloons, or those jaggy SHOUT balloons. All balloons can be re-scaled and edited independent of the background.

You can save your comic in ComicSetter's format. It will then write to disk all the pages of your creation as one document. This way, you can have several pages of your comic in memory at one time, and flip between them at will. Or, you can save a page or panel as an IFF bit-map, for inclusion into another IFF supported program. It also includes the standard Cut, Paste and Copy options for clipping art and objects between panels and pages (the number of pages you can have in memory at one time is limited by your available memory, and ComicSetter requires at least one megabyte of memory to run at all).

ComicSetter supports two types of graphic modes. The first is the more familiar "Bit-Mapped" graphics, where you click the mouse to place a line, and that line will then exist as a series of dots on the screen. In this mode, you could think of each pixel as a "cell" that can be filled with one of your colors. Should you increase the size of a bit-mapped object, the pixels that make up that object will increase in size proportionately. This tends to make bit-mapped objects that are scaled upwards look "jaggy", and also will cause objects that are scaled downwards to lose definition and detail.

The other type of graphic is called a "Structured Graphic." This type of object is defined mathamatically and is always displayed at the current resolution of the screen, no matter how you re-scale it. ComicSetter uses Bit Mapped graphics for it's IFF Clip Art of backgrounds and characters. Structured Graphics are used for the creation of panels and text balloons. The Tools menu includes tools for the creation of both Bit-Mapped and Structured Graphics. Bitmaps are good for creating backgrounds and characters. Structured graphics are great for simple polygons and curved shapes.

The fact that both are included makes this much better for printed output, since Structured Graphics will print at the highest resolution that the printer is capable.

(continued on page 14)

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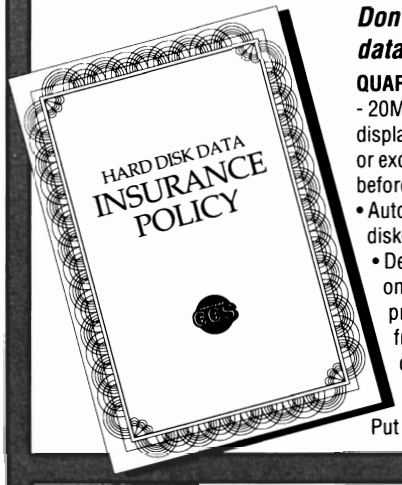

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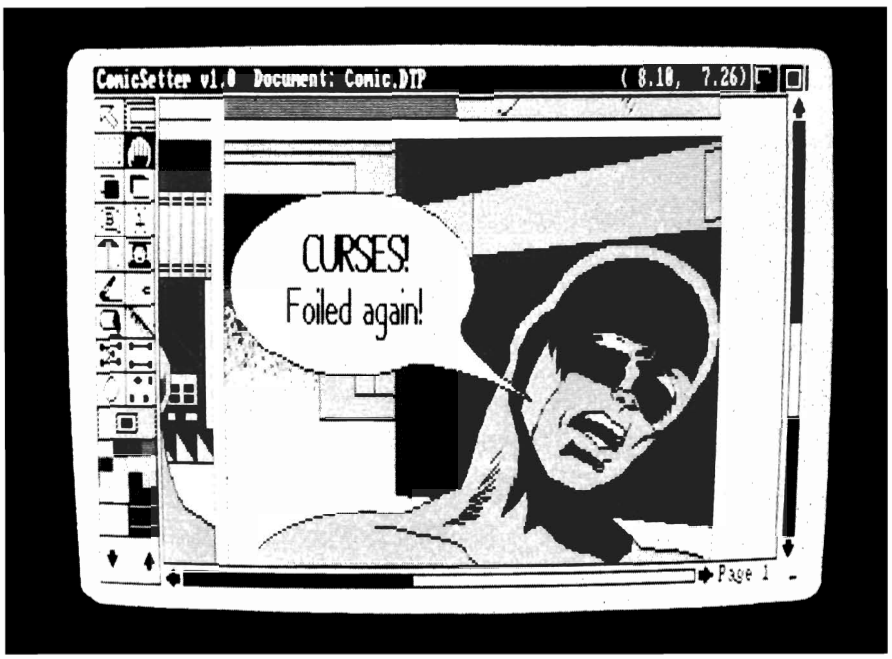
Comic Setter *(continued from page 12)*

The printed page is the definitive end product of ComicSetter, and Gold Disk has implemented a full featured print menu for this program. It allows you to define the page range to be printed and how many times you want each page printed. You can set the density of the dots per inch from here. Color printing, gray scale and black and white printing are supported. This menu also supplies three different settings for gray scale patterns. There's even a smooth function that will attempt to smooth out any "jaggies" created when you scale the size of the page upwards.



Comic Setter's toolbox. located along the left side, has other tools embedded within the tools

Gold Disk obviously wants it to be known that their area of specialty is DeskTop Publishing, and they've lived up to that reputation with the print functions included here. ComicSetter also touches lightly in the documentation on the art of creating a page that flows. It gives you hints on directing the action so that the reader's eye is carried from panel to panel, and so on. This is a nice touch, but should really be supplemented by the user with one of the several books available on creating Comic Art. As far as errors go, I was distressed to find that some of my Bit-maps got scrambled when I scrolled them off the screen. This forced me to save my work after every panel. A good habit to get into, but I shouldn't be FORCED to do it. I was able to crash the program several times, while resizing bitmaps. When I did, I first got a requester from the program that allowed me to save my work to disk before "going to meet the Guru." This unique error-trapping routine included an error identification code that would probably have been of more help if any of them were documented. But given that registered users are supplied with Gold Disk's Technical Support line, one could quickly learn what not to do. I sincerely hope that Gold Disk addresses these problems in the near future. Gold Disk has promised free bug fixes to registered users. Registered users also receive a free subscription to New Laser Times, Gold Disk's publication devoted to exploring new and creative uses for DeskTop Publishing.

All in all, I found ComicSetter to be a fine program for someone who wants to specifically create comic books and panels. It's claim on the box cover of being great for putting together "newsletters and Boffo Birthday cards," may be a bit overstated due to it's entry-level graphic and text editors. For single frame documents, I'm sure you could do as nice a job with the ComicSetter Clip-Art and your paint program, if you have one. If you've always wanted to make your own comic book, this program has all the specialized tools to get you on your way.

ComicSetter $99.95

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Magellan

Artificial Intelligence comes to the Amiga

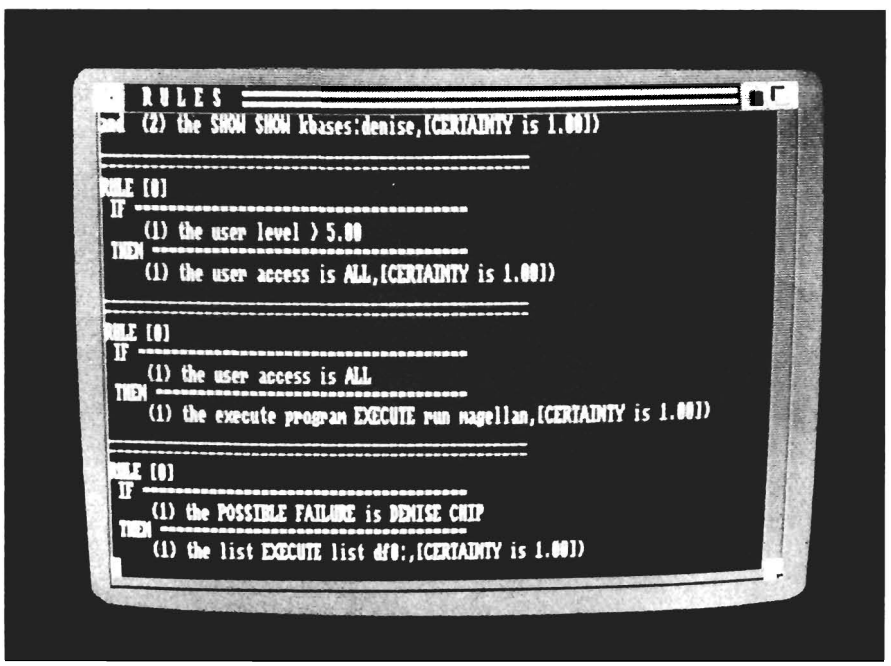
by John Sawaya

Ferdinand Magellan was a famous navigator and explorer in the sixteenth century. Today, the Magellan software product from Emerald Intelligence can help you navigate through a knowledge base and explore new capabilities for the Amiga. Magellan allows you to construct your own expert system. "But," most of you will ask, "What's an expert system?".

An expert system is a computer program that simulates the knowledge and reasoning process of a human expert, by asking questions and giving answers based on facts and logical rules. It's a form of artificial intelligence (AI) which can be used for diagnostic systems, decision support systems, and for many other applications. The AI center at Boeing, where I work, develops expert systems for engineering, manufacturing, and customer services.

Magellan uses logical information from a knowledge base to make inferences and deduce conclusions. Many expert systems are used for diagnostic purposes, like figuring out what could have caused some type of fault. The user can attempt multiple goals, then Magellan tries to backtrack through all the rules that might substantiate those goals in order to find a cause.

The rules in the Knowlegebases set up the parameters for the expert system



Why do we need expert systems? Expert systems can solve problems accurately, reliably, and quickly, and come to the same conclusions each time. Also, the conclusions can be substantiated with supporting rules and facts. Expert systems work best in very routine, well defined problems, and under normal circumstances. Human experts are still required to make decisions in those exceptional and unusual circumstances.

A knowledge base is built from human experts describing what they know about a given problem or situation. It contains a collection facts and logical rules. These rules are similar to "if/

(continued on next page)

then" programming statements in C or Basic. Facts are pieces of information that do not depend on anything else. From facts, other information can be inferred using rules. Rules are treated like data which can be interpreted and modified according to the needs of the problem. Examples of rules:

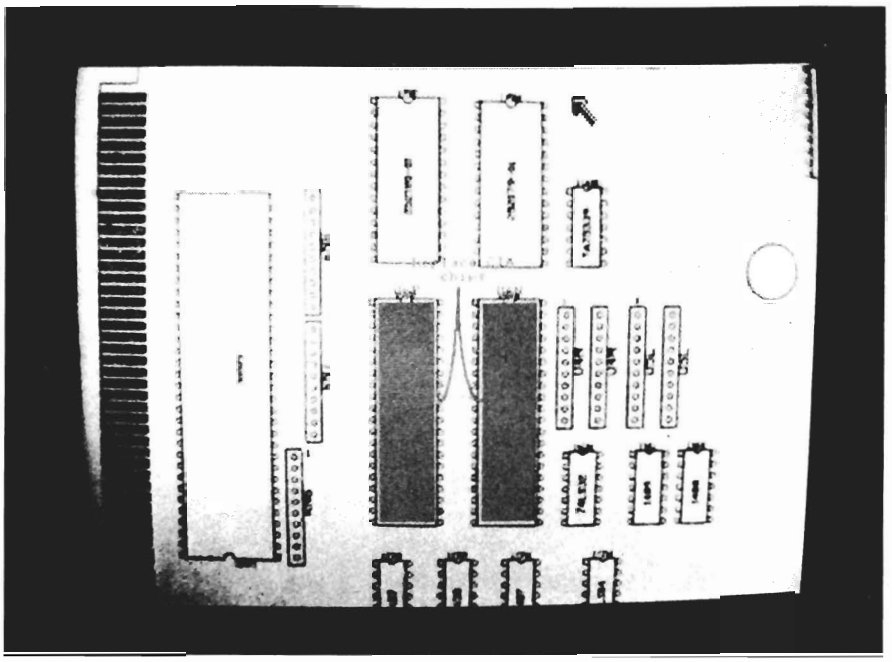
IF the premise is true THEN something is implied.

IF some conditions can be satisfied THEN perform some function can be performed

IF X size is large then X weight is heavy (with a degree of certainty).

Magellan has three main components. First, is the interface which allows the user to interact with Magellan. It also controls the access to other Amiga software. For example, Magellan can display text and graphic information as part of the user interface, while solving a particular problem. Magellan can be used to compute mathematical equations, execute external programs, display IFF images, print, or interface with almost anything (Emerald Intelligence plans to implement the ARexx interprocess communication standard in the future. This would allow Magellan to send and receive messages (commands) between other programs running concurrently). Many practical applications could use an embedded expert system.

The second component is the knowledge base, which includes rules, cells based on rule clauses, and words for your own dictionary. The third component is the inference engine. This is the part of Magellan that figures out how to solve the problem, and what rules apply based on the current set of facts and assertions.



In this simulation, the program has reasoned that the most likely cause of failure on the Amiga motherboard is faulty CIA chips

THE KNOWLEDGE BASE

Using Magellan is easier than traditional AI programming languages like Lisp and Prolog. These languages are typically used to construct an inference engine, then operate on a knowledge base. With Magellan, the inference engine is already built. All you need to do is supply the knowledge base. You can create and modify rules interactively, and immediately try them out. You can specify "legal" values for each cell, and you can define your own dictionary of terms and synonyms. This may not satisfy the AI practitioners who enjoy the programming as much or more than the application, but it will please those who have to wait months for their needs to be met.

Magellan can have over 500 rules in one megabyte of memory, and thousands of rules on a fully configured Amiga. That's an extremely large expert system. Many expert systems in real-world use have between a hundred to five hundred rules. Magellan allows the problem to be stated at various levels of detail, which makes it easier to create a knowledge base.

The user can format rules using the RuleBuild window. At the top, it asks for a rule number and a short description of the purpose. It forms an "if/then" relation using boxes to define each clause with an object, attribute,

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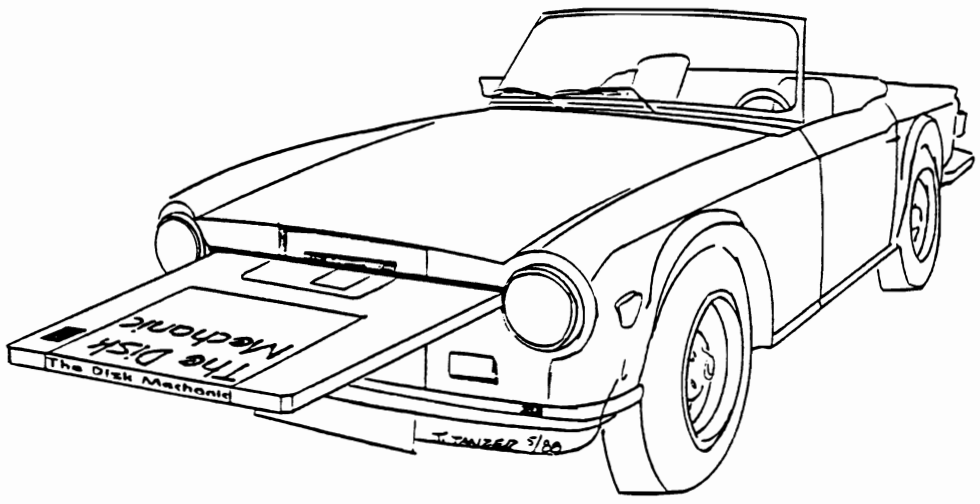

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operator and a value (along with a degree of certainty or a threshold limit). An object can be anything. An attribute is an optional characteristic of that object. The operator defines the kind of relationship. And, a value can represent a number, a file name, a mathematical expression, or just some text string. Certainty and threshold are like probabilities, as explained later.

Examples of some Magellan operators include:

"IS", "IS NOT", ">" (greater than), "<" (less than), "=" (equals), "<>" (does not equal), ""EXECUTE" (invoke an Amiga DOS command), "PRINT" (print text), "SHOW" (display an IFF image), and "PARSE" (evaluate a mathematical expression).

Generic terms can be used for rules that apply for any object or attribute, i.e. "?A".

Up to five premise (IF) clauses can be connected together using either "AND" or "OR." Also, several dependent (THEN) clauses can be connected using "AND."

For example:

IF object attribute IS unknown
OR count > 10
THEN disk directory
IS displayed
AND also
EXECUTE c:dir

THE INFERENCE ENGINE

The rules in an expert system knowledge base chain together so they can be evaluated forwards or backwards. Backward chaining is one way that Magellan extracts information from the knowledge base. Given some object (or goals), backward chaining is used to find relevant supporting facts. This technique can be used for diagnostic problems. When Magellan needs more information to test a rule, it checks if there is any way that information can be derived from any other rules. If not, it simply asks you using a customized window interface. Forward chaining of rules is even simpler. Starting with a set of facts, conditions, or constraints, Magellan determines what other information can be asserted. This new information, in turn, may cause other rules to be applied. This process is repeated until no further information can be derived from the knowledge base.

"Magellan has tremendous potential. I haven't explored every feature...but I can project a wide variety of expert system applications"

CERTAINTY AND THRESHOLD

Real-world problems rarely have absolute answers. Certainty factors are used for rules that imply or suggest an answer, but not necessarily the only one. Magellan allows certainty factors in rules where the data may strongly imply a particular solution, but where other solutions are also possible and only a best guess determination can be made.

The degree of certainty can be established for each clause in the Magellan knowledge base. This is an excellent feature for implementing "rules of thumb", which cannot be 100% accurate. For example, a rule could say if something's size is large then its weight is (probably) heavy, with maybe 80 percent certainty.

When uncertain rules are chained together with other uncertain rules, those results become even less certain. Magellan allows you to filter out unlikely results that have a fairly low certainty by using threshold values. For example, you may want to ignore a rule premise if it is less than 20% certain. If there's more than one solution to a given problem, Magellan will keep track of all the possible solutions and display a list of them.

MENU OPTIONS

The Magellan menu has seven general categories: Session, Rules, Cells, Words, Inference, Display and Explanation. Session is similar to project in many other Amiga programs. It allows you to open a knowledge base, load and save values, and to exit from Magellan. The Rule menu allows you to select, edit, create, delete, and display rules in the knowledge base. The Cell menu option allows you to select and display cells in order to attach legal rang-

es of values. You can customize text and graphics for user inquiries. The word menu option allows you to select, display, and edit dictionary entries and synonyms for words used in rules. The Inference menu allowsthe user to navigate through the knowledge base, either forward or backward. There's also a third option, Synergistic, which allows the user to go backward to solve goals, then turnaround and go forward to find all other asserted rules. The Display menu option is used to preview graphics and to set the output mode to the screen, printer, or to a file. The Explanation menu option shows why a given conclusion was reached and shows the path of reasoning followed. You can also trace the logical reasoning Magellan uses by sending explanations to a printer, log file or the screen.

There is also a "WHY?" gadget which explains why information is being requested. Requests can come up automatically in order to complete the analysis, based on some need to know. Magellan won't ask you all the questions in the knowledge base, only the ones needed to track down a conclusion for the given problem.

To give you an example of Knowlege Bases in action, Magellan comes with a few small demonstrations. The AmigaDiagnostics sample is the best developed, and it contains fewer than 10 rules! (One of my major concerns is the small size of these samples. How well will Magellan work with 100 or 200 rules?) To begin our Amiga Diagnostics session, we select Load

(continued on next page)

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KBase from the project menu. Click on the proper name, and after a few seconds messages indicating the number of rules loaded will appear. We can learn much by using the Display option from the rules, cells and words menus.

Rule 3 states:

If the Symptom is a Flashing Solid Green Screen then the Possible Failure is DENISE chip [certainty is 1.00] and the SHOW is SHOW KBASE:DENISE [certainty is 1.00]

At any time you can get a printed version of the rules or words, by highlighting a selection from the Display menu. This set of rules was entered from a Commodore Technical repair manual for the A1000 and is intended as a tool for service technicians. Various screen colors were linked to possible component failures with degrees of certainty. Then synonyms were entered so that various users of the KBase can respond to questions in their own words. To see the inference engine in action, select Attempt from the Inference menu.

A new window will open and prompt you for a symptom. You can click on the WHY gadget for an explanation of what's happening. Another window will open and explain that the Goal is to determine if there is a failure, and the subgoal is to determine the symptom. The active rule is also stated as a plain English sentence. Our service technician needs to click on a close or front-back gadget to return to the input window. Now, lets say we type "black screen" in the input area. Magellan may present another input window asking if there are white bars or horizontal dashes. The process continues with only the relevant questions presented until all the rules have been examined. Each response determines the next question. Based on one to three questions, Magellan will show its conclusion, i.e. Denise Chip Failure, and follow the text with an actual image of the circuit board with the Denise chip highlighted in red. This sample is an effective example of the power of Magellan: complex Rules, certainty, synonyms, easy user interface and complete access to other Amiga programs, graphics, and sound.

CAVEATS

I spoke with David Kennedy, the developer of Magellan, about several problems I had with the user interface. He was very helpful and seemed to be genuinely concerned with "user support." There is even a Bulletin Board System for registered users to participate in conferences, receive updates, swap knowledge bases, etc. One very annoying requirement is that you must select one window for the menu options, then select another window before you can key-in an answer to a prompt. The menu commands should be made more accessible. Providing some F-Key or Amiga-Key alternatives for various mouse operations would speed up things. For example, "Alt-Return" might be used on the RuleBuild window to jump to the next clause.

The Rule selection interface needs a little more enhancement. Rules should be selectable by simply entering the Rule Number directly on the RuleBuild window. A delete rule gadget could also be on that window. Also, there is no way to remove unused cells or words. Finally, the display windows need sliders or pause control. The entire list will flash by and unless you are a speed reader you will need to turn on your printer and select display again. Here is my wish list: (1) a scrollable requester of objects and attributes for back-chaining, sort of like a filename requester, (2) ability to bulk load new rules into the knowledge base from a simple text file, (3) more extensive examples in the manual and in the sample knowledge bases.

CONCLUSIONS

Magellan has tremendous potential. I haven't explored every feature and capability of Magellan, but I can project a wide variety of expert system applications. It compares favorably in power and features to the products available for the MAC and PC. Combined with the Amiga's powerful multi-tasking environment, animation, speech and graphics, Magellan can achieve great success.

Magellan $195.00

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Moniterm's

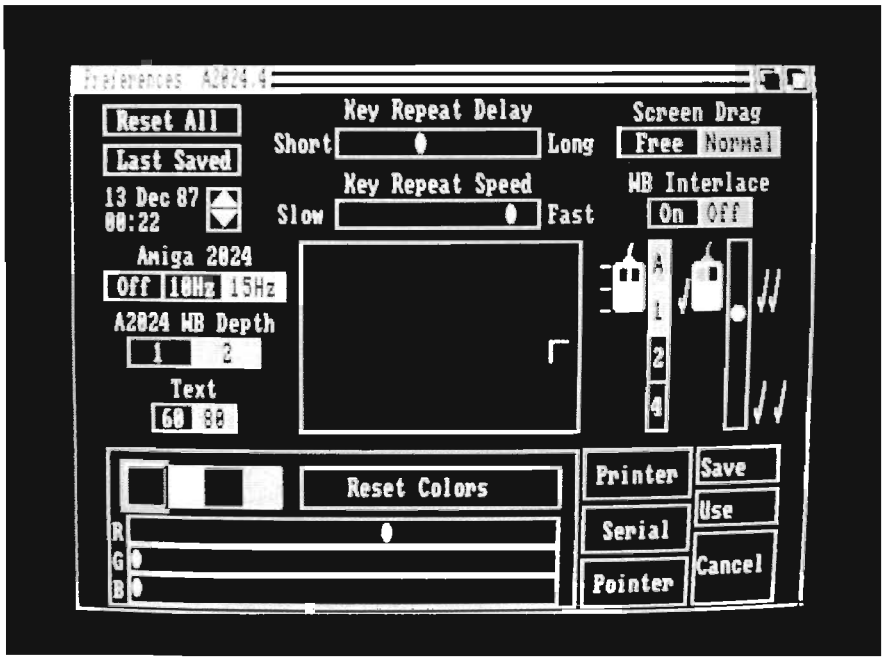
VikinG

Getting the BIG Picture

by Steve Dock

At the 1988 Siggraph in Atlanta, a well known manufacturer of add-on monitors for Mac and PC markets made a surprise introduction for the Amiga. Moniterm is one of about 6 companies who specialize in producing large, high-resolution, full-page screens for professional applications. This is a burgeoning market which includes desktop-publishing, CAD, scientific and engineering workstations, and financial analysts. Moniterm has been making monitors for 10 years. Their claim to fame centers around a very successful line of 19 and 24 inch monochrome and gray-scale monitors for the PC and Mac markets. These range in price from $2400 to $6000! For their initial Amiga product offering, Moniterm choose the Viking 1, a 19 inch gray-scale, square-pixel, 63 MHZ unit with a potential resolution of 1280 horizontal by 960 vertical. The monitor and required A2000 video display board list for $1995, mostly due to the cost of the extensive amounts of video display ram commonly required by these systems. What *is* so special about this large monitor is its rock-steady 1008 by 800 resolution usable by many existing software products on the Amiga.

The Moniterm Viking monitor uses the A2024 preferences developed by Commodore to control the various modes available through the Hedley Hi-Res System



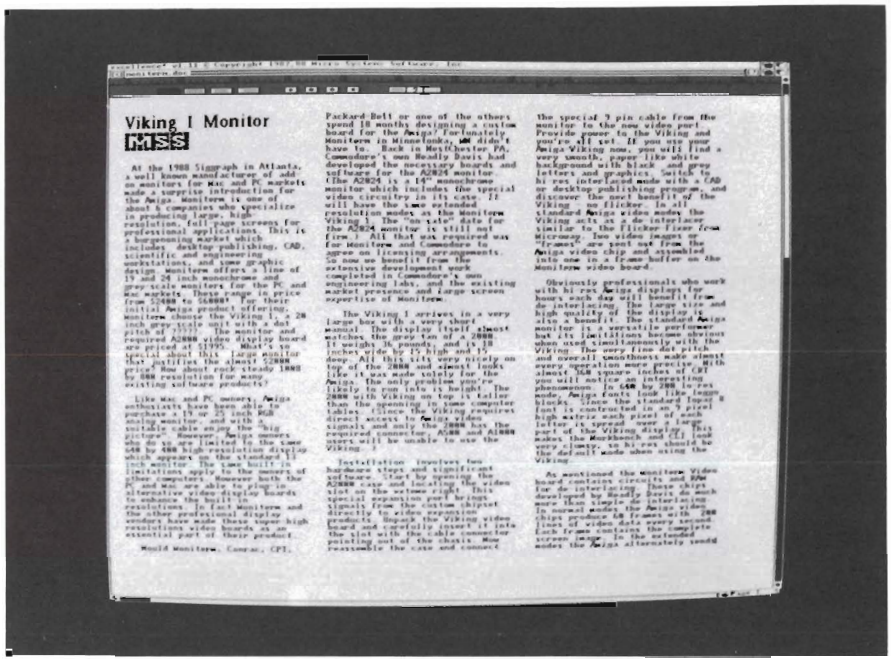
Like Mac and PC owners, Amiga enthusiasts have been able to purchase a 19 or 25 inch RGB analog monitor, and with a suitable cable, enjoy the "big picture." However, Amiga owners who have done so were limited to the same 640 by 400 high-resolution display which appears on the standard 13 inch monitor (the same built-in limitations apply to the owners of other computers, as well). However both the PC and Mac are able to plug in alternative video-display boards to enhance or replace the built-in resolutions. In fact, Moniterm and other professional display vendors have made these super-high resolutions video boards as an essential part of their product.

(continued on next page)

Viking (*continued from previous page*)

To get in on all the fun, we would have to wait for Moniterm, Conrac, CPT, Packard-Bell, or one of the others to invest 18 months designing a custom board for the Amiga. Fortunately, Moniterm in Minnetonka, MN., didn't have to. Back in West Chester, PA, Commodore's own Hedley Davis, along with Dale Luck, had developed the necessary boards and software respectively for the A2024 monitor. The A2024 is a Commodore product, and is essentially, a 15" version of the same technology. With the 2024, however, an extended mode display may be achieved with any Amiga system (including the A1000) by simply plugging into the RGB port and running the software. This is due in large part to embedding the controller card within the 2024, as opposed to the separate card required with 2000 versions. It has the same extended resolution modes as the Moniterm Viking. However, it soon became apparent within Commodore that the small size of the 2024 monitor could hinder the marketability of these new modes of operation. With a company like Moniterm supplying the monitor technology, the Viking could elevate the Amiga into some of the professional application areas.

The Viking is a seemingly rugged-built monitor with a color that almost matches the gray-tan of a 2000. This unit sits very nicely on top of the 2000, and almost looks like it was designed for it. The only problem you're likely to run into is height. The 2000 with Viking on top is taller than the opening in some of our computer tables. Since driving



Programs such as excellence! open an extended mode window, which enables them to display major amounts of information at once on the Viking monitor

the Viking requires direct access to Amiga video signals, the A2000, with its video slot, is well suited to this application.

Installation involves two hardware steps and significant software. Start by opening the A2000 case and locating the video slot on the exteme right. This special expansion port brings signals from the custom chipset directly to video expansion products. Unpack the Viking video board and carefully insert it into the slot with the cable connector pointing out of the chasis. Now reassemble the case and connect the special 9 pin cable from the monitor to the new video port. Provide power to the Viking and you're all set. If you use your Amiga-Viking setup right from startup, you will find a very smooth, paper-like white background with black and gray letters and graphics. Switch to hires interlaced mode with a CAD or desktop-publishing program, and discover the next benefit of the Viking - no flicker. In all standard Amiga video modes the Viking acts as a de-interlacer similar to the Flicker-Fixer from Microway. Two video images or "frames" are sent out from the Amiga video chip and assembled into one in a frame-buffer on the Moniterm video board.

The large size and high quality of the display is also a benefit. The standard Amiga monitor is a versatile performer, but its limitations become obvious when used simultaneously with the Viking. The overall smoothness make almost every operation more precise. With almost 360 square inches of CRT, you will notice an interesting phenomenon. In 640 by 200 lo-res mode, Amiga fonts look like leggo blocks. Since the

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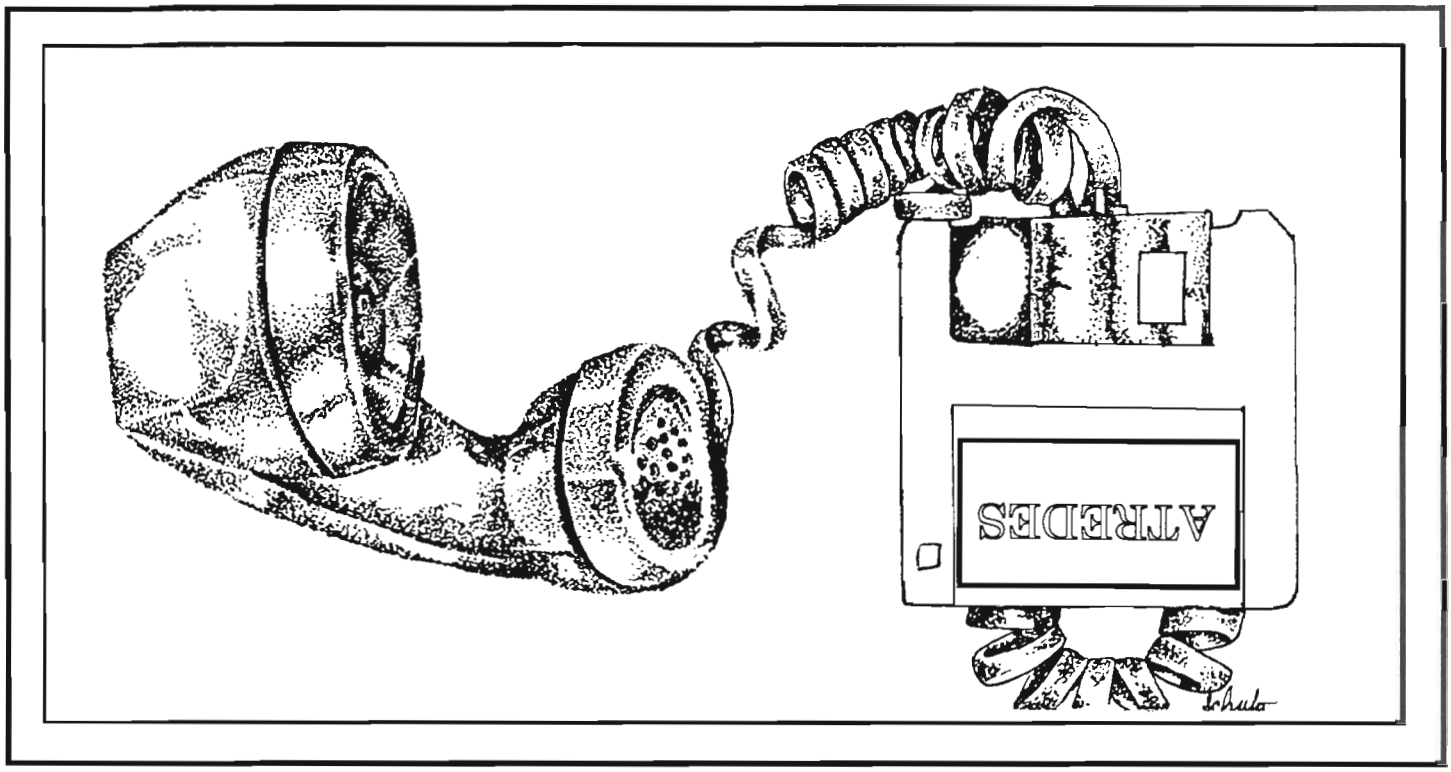

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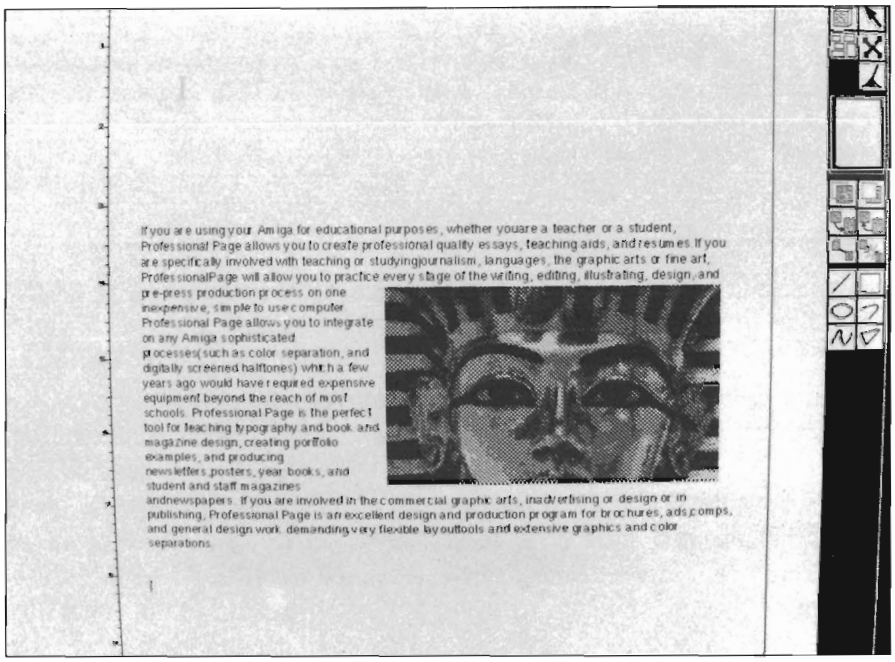
Viking (*continued from page 22*)

standard Topaz 8 font is contructed in an 8 pixel high matrix, each pixel of each letter gets spread over a large part of the Viking display. This makes the Workbench and CLI look very clumsy, so hi-res should be the default mode when using the Viking.

As mentioned, the Moniterm Video board contains circuits and RAM for deinterlacing. The design, however, does much more than simple deinterlacing. In normal modes, the Amiga video chips produce 60 frames with 200 lines of video data every second. Each frame contains the complete screen image. In the new extended modes, the Amiga alternately sends different frames to the Video board, each with a portion of a 1008 by 800 screen! The video board then reassembles the frames into a complete large image. There are currently two extended modes, both of which produce 1008 by 800 resolution. The 15 HZ mode produces four different frames of video and assembles them into a complete display fifteen times per second. To perform this work, the video chips of the Amiga are used as if in hi-res mode. Although 15 HZ produces the smoothest extended display, it uses so much of the available DMA bandwidth that contention with application software can result. The 10 HZ mode is provided to prevent this problem. In 10 HZ mode, the video chips operate in lo-res 4 bit-plane mode and send 6 alternating partial fields to the Video board. This results in an updated screen 10 times per second and no contention for scarce Chip Ram DMA, all the while, being transparent to the user. The hardware of the 2000 and Video board are ready to use as soon as the board is inserted into its slot.



Professional Page benefits greatly when used onViking's display

The more interesting part begins when you read on past the hardware section of the documentation. Commodore has licensed new graphics, exec, and intuition libraries to Moniterm which will ultimately appear in Kickstart 1.4. These new libraries work with the hardware to create new "extended" video display modes. The net result is a 1008 by 800 display with 4 shades of gray. That's almost twice the size of normal hi-res mode, and lets the forthcoming Publishing Partner put a full page display on the screen! Starting extended mode is an interesting process, however, and reveals much about the Amiga operating system.

We all know that the A1000 requires two disks to boot, Kickstart and Workbench. And that Commodore put Kickstart 1.2 in ROM hardware for the 500 and 2000 machines. Since booth are required for the operating system of the Amiga to function, why two seperate components? Kickstart, whether in ROM or on disk, incudes the low-level components of "AmigaDos" on which the remaining parts depend. These components are software libraries which handle the custom chips, I/O, and CPU processes directly. They currently require about 182K of address space in your Amiga system and have not been formally modified since 1.2. Kickstart 1.3, sometimes known as version 1.2.1, provided one modification to support the autobooting of hard drives and other devices. The Workbench also contains many software libraries in the LIBS directory, but these,

like almost all application software, call the Kickstart routines to get their work done. You want the flexibility of adding libraries as needed, eg: ARP , but you also need a constant set of protected system routines for basic functions. The basic building blocks are provided in Kickstart and, untill now, were protected from any modifications.

The Exec, Intuition, and Graphics libraries are part of Kickstart and provide for screen displays, graphics functions, window operations, etc. The 1.2 and 1.3 versions of this software can only support standard Amiga display modes. Dale Luck has developed most of the software needed for extended modes, as well as an ingenious technique to install it - Jumpstart. The Viking comes with a special startup disk which contains the Jumpstart routine. Upon insertion you will be asked if you wish to Jumpstart. If you answer yes, the special script will execute a RamKick command. Ramkick is a program found in the C directory which copys the new versions of Exec, Intution, and Graphics libraries into RAM. It then protects them against a reboot, and sets some special pointers in memory. Ramkick includes a checksum routine to ensure that the libraries are accurately copied. It then starts a soft-boot during which the Amiga boot routine will recognize the location of the new libraries and, based on their version number, will replace their ROM equivalents until the machine is powered off. The new libraries take about 16K of Chip ram and 125 K of Fast ram. Now that we have cleverly patched the ROM based components of the Amiga operating system, you would expect the on-screen display to change. Not quite yet. The disk based portions of AmigaDos must also be notified about the extended display modes. This is done in three steps from the Workbench Screen.

First, setup the custom A2024 Preferences. The Jumpstart disk includes a new version of Preferences which has gadgets for setting Extended Mode. There are three choices, A2024 OFF, 10 HZ or 15 HZ (more on these later). Select yor rate and then click on the SetMonitor ICON. This will open an IconX window

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to do its work. Setmonitor is a program in the C directory which notifies the Ramkicked Graphics library of the type of monitor connected to the system. You can include the Setmonitor command in a startup-sequence by using the line SETMONITOR -s 80. This command can take on other values to support future monitors (Hmmm, I wonder what they're cooking up now?).

Finally, we need to close the standard mode Workbench screen and replace it with an extended resolution display. Another Icon, ResetWB is provided for this function. ResetWB is a bit tricky to use, however. Since it closes the existing WB screen, no user windows can be open at the time you click it. This means that ResetWB will not work from the CLI or a startup script since the CLI always opens a window). A simple click and... WOW!

At last we see what we've been waiting to see. The hardware and operating system of the Amiga have been modified to support Extended video resolution. The formerly large and blocky Amiga fonts are now small, smooth, and precise. The scope of the Workbench screen is massive. Grab and stretch a CLI or NotePad window and be amazed at the amount of information which can be used at one time. Since we're using modified Intuition, Exec and Graphics libraries, all the normal Amiga functions work as expected. Icons open windows which can be dragged, resized or moved behind other windows. Menus pull down and text gadgets pop open precisely as they do in standard modes. All properly written software will work in the new 1008 by 800 mode. Some will even open a full screen window to take advantage of the higher resolution (Amiga programmers should have already been using the GetScreen() function to return information on screen size and number of bitplanes).

There are some restrictions and limitations in the extended modes. There is only one sprite available, sprite 0. Also, double buffering and user copper lists are not supported. Since these restrictions affect animation and movements, they should not interfere in the professional applications for which the Viking is suited. However, there are a few functional changes which may be noticeable in these areas. First there is the obvious lack of color. Since the Viking supports only 4 gray shades in extended mode, menus which normally use 8 colors will be unreadable. Again programmers can use the SETRGB(4) function to provide mapping into the gray-scale mode. Extended mode screens can not be dragged. Windows on the screen can be dragged, and you can use back-front gadgets to switch between screens, but extended screens cannot be slid up and down as normal. This does not present any functional problem, as long as programmers remember to include back-front gadgets. Finally the SetAlert function performs differently. This function is more familiary known as the dreaded GURU. Instead of pushing your screen down from the top, an extended mode alert will open its own full screen display on top of the extended mode screen.

The other "limitation" is Chip Memory usage. Remember that extended mode is using a 1008 by 800 two bit-plane raster. That requires about 200 K of Chip Ram, with the new libraries using another 15 K. Subtract this from 512K and you have little left for applications. Fortunately most applications will be able to run in this remaining space. What the extended mode really needs is 1 Megabye of Chip Ram. Commodore has a functioning Agnus chip which provides just that. It's just a matter of time until it is released. Moniterm's introduction of the Viking should speed the release of the Fat Lady to the general populace.

Enough theory and background. How well does it work? Getting JumpStart, Setmonitor and ResetWb in place adds about 2 minutes to a power-up routine and takes a few tries before becomming routine. Once the routine is established, however, this software works its magic every time, and the extended mode screen is ready for work. We tested a large sample of professional applications for which the Viking is intended and found that they fall into two main categories. Some software opens windows on the WorkBench screen, and some open a custom screen. If an application opens its windows on the WorkBench screen, it will automatically be in extended mode. Those which open a custom screen can be divided into two further categories. Some have fixed size windows, while others allow for scrolling around. All the software we tested loaded and ran under extended mode. What

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varied is the degree to which the given package can take advantage of 1008 by 800 resolution. Excellence!, much to MicroSystems' credit, takes *full* advantage of extended mode. It opens a full 1008 by 800 window without the need to manually stretch it. In this mode, Excellence! can support about 130 characters across its window. You can import graphics, use fancy fonts, and operate well on the large professional display. SuperBase Pro from Precision Software also opens a full size window in extended mode. I should qualify this, since the VCR like controls at the bottom open their own fixed size window which now is half a screen wide. The data window can display more than twice the number of fields and records. Analyze! is a spreadsheet also from MSS. It too opens a window on the Workbench, but you must stretch it using the resizing gadget to full size. The Analyze! window grows from 13 columns by 94 columns and doesn't slow down at all! WordPerfect behaved simillary by opening a small window which could be stretched. However WP experienced definite slow-down in screen movements. Both WP and Scribble! give 120 characters accross the screen in extended mode.

Some of the software which only benefited by de-interlacing includes ProWrite, Pagesetter, MaxiPlan Plus, and ShakeSpeare. Each of these opened its own 640 by 200 or 640 by 400 screen, but could not be stretched to larger resolution. Suprisingly, the same held true for the CAD software which I tried. Aegis Draw+, Dynamic Cad, and IntroCad each operate on their own custom screen. These vendors will have to include Extended Mode support real soon. Aegis Draw+ uses more than four colors in some menus, and so became difficult to use. This can happen in many graphic packages which also tend to use many colors in their menus. Deluxe Photolab was an interesting case. The Paint program opens its own screen, but since it supports "super-bit-maps" of very large size you can define one at 1008 by 800. This doesn't mean that you will see it all on one display. You can scroll around a multiple display screen using the mouse or arrow keys, though.

Finally, there are the high end desktop publishing programs. Professional Page will support the extended mode, but you have to change a tooltype in its ICON. If you start PPage prior to this change the program opens a 1008 by 800 window alright, but you have to move it far to the left to see the toolbox. This mode is all but impossible to use. So click once on the PPage icon, select INFO from the WB Menus, and change SCREEN = CUSTOM to SCREEN = WORKBENCH. Now click on SAVE and you're all set. The next time you start PPage, it will open its window on the WB screen and a full 8.5 by 11 page will fit nicely along with the toolbox. This is obviously the way DTP was meant to be. At 100% magnification you can read and type text while viewing the entire page. Only for detailed alignments or graphic editing do you have to switch magnifications. We also tested a pre-release version of Publishing Partner Professional. It behaved like PPage before changing the ToolType. A 1008 by 800 screen was opened, but needed to be moved around to see a full-page. PPP also uses Tooltype, as well as command line switches to open a WorkBench window. Once again, the difference was dramatic. A full page of formatted text which can be directly edited. PPP also supports various levels of magnification, and includes its own sets of scalable fonts.

About 1 million professional monitors ship per year, and with good reason. Those who make their living in front of a "tube" need the best tools available. If the Viking is financially successful, perhaps the 24" and color super-hires displays will follow. Hedley Davis and Dale Luck have created a much enhanced display mode for the Amiga. Moniterm has used their experience in Custom OEM markets to bring it to market. The combination of Viking and the A2000 will enhance productivity and can be cost justified easily. Amiga software developers have shown that they can adapt to these new modes, and there are alternatives to the few who don't. My only concern is the continuing delay in release of the 1 MB Agnus. If Commodore doesn't deliver soon, Moniterm's efforts may be cramped by Chip memory constraints. In the meanwhile, the Amiga now has the BIG picture it so richly deserves.

Viking I $1995

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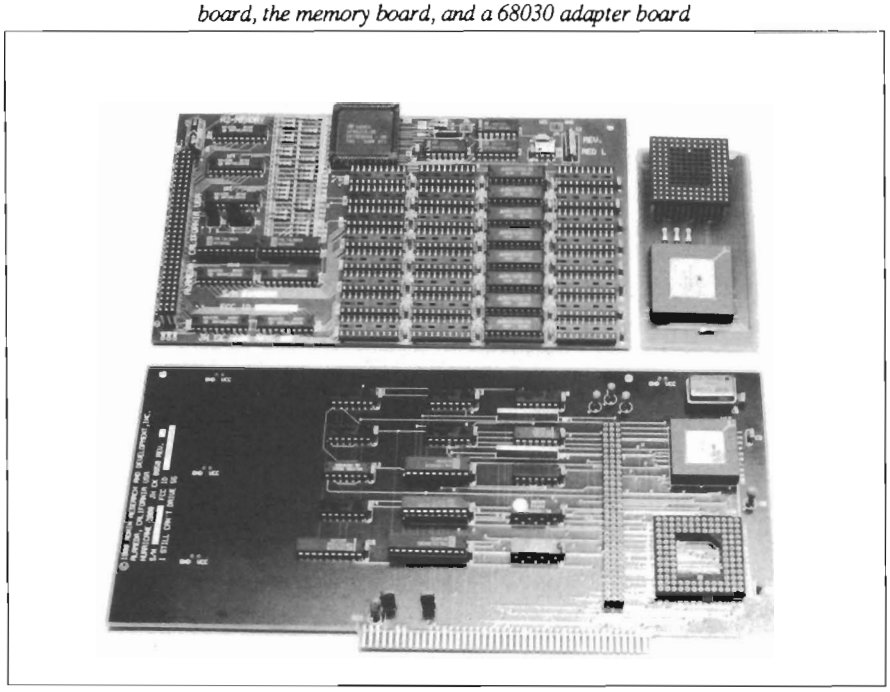
Ronin's H2000 accelerator

Plug in 32 bit Power Processing

by Dave Haynie

The H2000 is a 68020 Accelerator board for the Amiga 2000. It has two optional accessories: a 4 megabyte, 32 bit wide memory board, and a 68030 conversion board. In this review I examine the benefits of both the 32 bit memory and the 68030 add-in. The H2000 board is a short board with an 86 pin edge for the CPU slot of an A2000, and a 96 pin connector for a RAM daughterboard. The main board also contains a 68881 math coprocessor. Unlike other accelerator boards I've seen, the math coprocessor on the Ronin board can only be clocked with an external crystal. I don't see any particular disadvantage to this. External crystals are cost only a few dollars, and the standard 16MHz 68881 chips will certainly perform better at 16MHz than at the 14.3MHz that the 68020 or 68030 will run at. Ronin supplied crystals for 16MHz, 20MHz, and 24MHz. I examined all floating point operations at both 16MHz and 24MHz, to show the difference a faster, but more expensive, math chip is likely to make.

The Ronin Accelerator board; consisting of the main board, the memory board, and a 68030 adapter board



The add-on memory board supports up to 4 megabytes of 32 bit wide memory. The board I used for these tests came populated with 1 megabyte of 32 bit ram. The 68030 board in this setup is a very simple 68020 to 68030 translation board. Other than the 68030, this board has only sockets and 4 pullup resistors on it. Thus, this Ronin accelerator board is naturally a 68020 system, with a 68030 adapted to it. However, this does not prevent some of the 68030's better features from being accessed in this design.

INSTALLATION

The first thing to do with an accelerator board is, of course, to icheck for speed of installation. The Ronin board plugs into the Amiga 2000's Coprocessor slot, and as a result, does not require anything to be removed or

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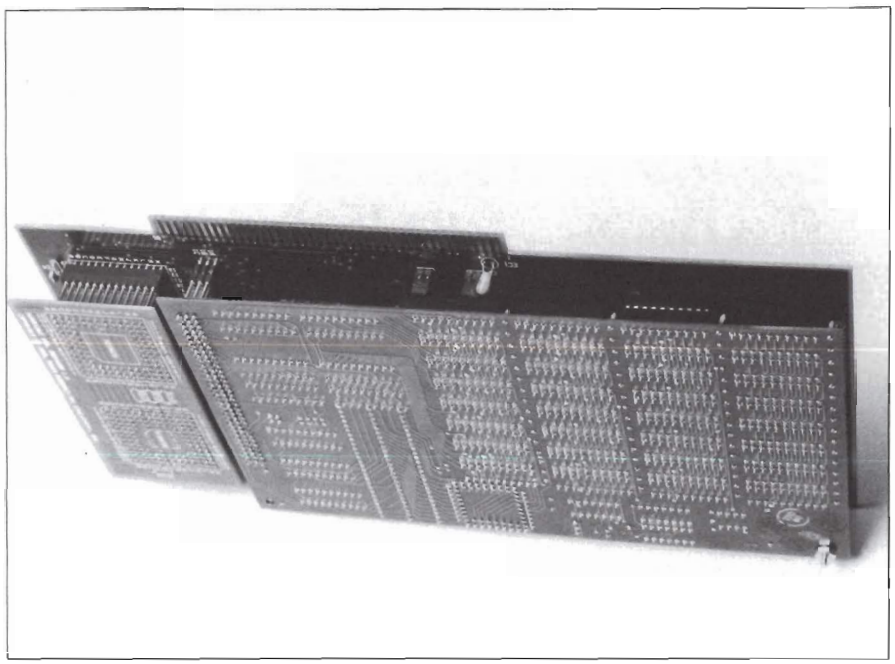

The individual cards mate together to form a sandwiched unit that uses 1-A2000 slot

changed around in a standard A2000 system. This board will also work in the original European A2000 system, though the 68000 will have to be removed, and a jumper brought over to the 68000 socket of that machine. All US A2000's use the newer motherboard. I received the boards all put together, though even if bought separately, mating the various boards together is straightforward.

The Ronin board (actually, all three boards), did install easily and worked the first time I powered up my machine. The complete board can be configured with a program called "Hurricane Config" on the disk that Ronin supplies. This program goes out and hunts down the 32 bit memory, if any, and adds that to the system. Then, if you've purchased a 68030, it will copy the ROM Kernel to a 256K chunk of that 32 bit memory and use the MMU to relocate this memory. Finally, it enables the datacache for all of this memory.

Did you guess? No autoconfiguration.

This Ronin memory doesn't autoconfigure, and that's normal so far with 32 bit memory. What's not normal here, and in fact a problem, is that in the default condition, this 32 bit memory is mapped into autoconfiguration space. That's strictly against the Amiga design rules; all memory that's mapped into the autoconfiguration space must be autoconfiguring memory. And all autoconfiguring memory must accept DMA from devices like hard disks. As is typical with 32 bit memory, the Ronin memory does not accept DMA from *16* bit devices. This can create two problems. First of all, if you have a number of autoconfig devices in place, the system may configure them to the same space used by the Ronin memory board. This could result in anything from missing devices, to power-on crashes. Secondly, once this Ronin memory is installed, most DMA devices will naturally try to use it for DMA, and this is likely to cause crashes. Ronin acknowledges this problem with the Fast FileSystem under Amiga OS V1.3 (the most likely occurance of DMA problems). However, their solution is for the user to specify a "Mask = 0x0fffff" in their MountList. What this line does is restrict DMA to CHIP RAM only. This will cause a big hit on DMA performance with deep screen resolutions, and will waste the limited CHIP RAM resources of your machines. It will work, but take note that in doing so, Ronin is circumnavigating several rules in this area.

The Ronin H2000 documentation mentions that the memory board can be re-located to sit outside of the normal autoconfiguration space, and thus DMA space, of the Amiga. However, they did not ship a RAM manual with this board. I tried for several hours to configure the board in such a way as to get the RAM in it's proper place and still have it be recognized by "HurricaneConfig", but was not successful. Providing this relocation will really work, I have no major problem with this board, other than the fact that Ronin is shipping it in a setup that's outside of the standard set forth by Commodore-Amiga.

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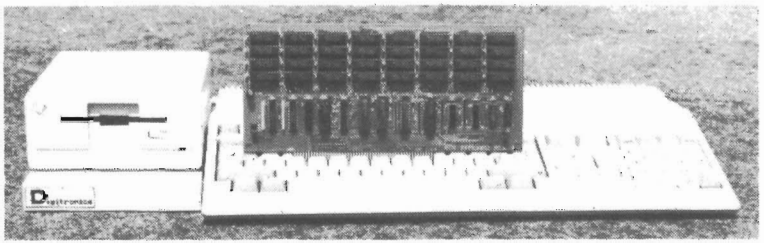

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As every new Amiga owner quickly discovers, memory is the key to unleashing the full power of their machine. AmigaDos' multitasking operating system needs room to flex its muscles in order to run today's more sophisticated larger programs. Consequently, memory is usually first on every Amiga owner's shopping list. So, what is the best path for upgrading?

For the A2000, a 2 meg board may seem the cheapest way to add memory, but it's too quickly maxed out. The sticker shock of an 8 meg board populated with its minimum configuration of 2 megs makes this route unappealing as well. The Digitronics RC4 Ramcard solves these problems.

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THE RONIN DISK

Aside from the unusual memory configuration mentioned above, I was pretty pleased with the Ronin disk. They provide a number of benchmark programs, some of which I used in this review. They also provide configuration programs for the Ronin board itself, programs to modify Cache setups and MMU Setups, a memory test program, some patch programs, and a file consisting of mostly helpful 68020 hints. The ability to turn off the instruction cache can help support older programs that don't know about the 020/030. The same goes for the 030s data cache. A patch similar to the public domain "DeciGEL" handles "MOVE SR,<ea>" exceptions, and they even provide patch programs to fix up AmigaBASIC and the Transformer to work with the 32 bit CPUs. Another patch program attempts to speed up math intensive programs by replacing compiler-generated 32 bit multiply routines for similar instructions now available on the 020/030.

I did have a few bones to pick, mostly with things stated in their documentation. In the "68020 Hints" file, which is otherwise pretty good, they claim that the "MOVE CCR,<ea>" instruction should be used instead of the "MOVE SR,<ea>" of the 68000. While that's true in a generic 68020 system, the Amiga system does not support the use of either. The operating system function "GetCC()" should always be used in place of either of these CPU instructions.

The instruction manual also states thatt there is a "bug" in the current Amiga system that prevents the data cache from being used on CHIP and FAST memory. This is false. CHIP memory cannot be data cached, since there's no way the 68030 can know when the blitter or other CHIP DMA writes to CHIP memory.

FAST memory can certainly be cached, but without going into details, it's part of the job of the accelerator designer to consider -- part of the 68000 to 68030 translation interface all 68030 devices must use. Ronin's 68030 adaptor does not take this detail into account and so, for Ronin's board, it is impossible to cache FAST memory or system ROM

(continued on next page)

(though "HurricaneConfig" takes care of any need to cache system ROM). Also note that the Amiga OS doesn't properly support the data cache, so it is possible to have random crashes when using it. These usually occur when multiple programs are loaded over one another.

BENCHMARKS

Aside from the few bones I had to pick, and the statement that "it works well otherwise," the main point of an accelerator card review is to see how well it accelerates. And that's what benchmarks are for. There are several systems being tested here, in various configurations. All the tests take place on a A2000 with 2 megs of regular 16-bit FAST memory and a Commodore-Amiga 2090A hard disk controller, driving a RoDime ST-506 45 megabyte hard disk under the V1.3 FastFileSystem. In order to simplify my tabulations of this, I'm assigning letters to each system configuration as follows:

A Plain A2000 System as mentioned.
B Ronin board with 68020
C Ronin board with 68020 and 32 bit memory
D Ronin board with 68030
E Ronin board with 68030 and 32 bit memory

For both systems with 32 bit memory, I run the "HurricaneConfig" utility to add in the Hurricane 32 bit memory and, in the case of the 68030, turn on the data cache and MMU, also copying the ROM Kernel into this 32 bit memory. This should demonstrate the relative performance of the 68020 and 68030 systems in their fully configured states. For the floating point tests, I test systems with both 16MHz and 24MHz 68881 chips.

Keep in mind that no matter what, benchmarks are an imperfect thing. Some of these have to be timed by hand, and even those timed by the computer can produce slightly different results if run twice on exactly the same machine.

INTEGER AND CPU PERFORMANCE

This section covers the basic integer/CPU performance of the system. I have selected several tests which attempt to illustrate thisperformance increase. It will become obvious that they don't all test exactly the same things.

The RamSpeed Test

This is a small program written by Perry Kivolowitz to test the speed of FAST versus CHIP memory. It's a reasonable test of how much faster 32 bit memory is than 16 bit memory, and also a reasonable test of the performance of the 68020 or 68030 to 68000 bus interface. Note that with the instruction cache turned off, most 32 bit CPUs will run slower here. In this test smaller numbers indicates a faster memory interface.

RamSpeed	A	B	C	D	E
FAST (Secs.)	29.08	20.65	7.32	20.77	7.22
CHIP (Secs.)	29.37	20.77	20.66	20.85	20.45

The Sieve Benchmark

Sieve	A	B	C	D	E
1899 Primes(Secs)	44.42	17.82	12.92	8.62	9.80

The Sieve is an integer based prime number generator, perhaps not the best indicator of performance, but it has been a long time standard benchmark. The sieve is measured in seconds.

The Dhrystone BenchMark

Dhrystone	A	B	C	D	E
No Registers	1026	1322	2623	1240	3168
Register	1074	1435	2807	1339	3404

The Dhrystone benchmark was designed as a test of integer computer speed and supposedly as independent of compiler optimizations and other neat compiler tricks as possible. It does have a good mix of function calls and integer math. It has a version that uses C register declarations, and one that doesn't specifically declare registers. This is Dhrystone V2.1, run with 320000 passes, compiled by Lattice V4.0. The larger number here (Dhrystones/Second) the better.

The SI BenchMark

The "SI" Benchmark is an index of relative CPU preformance

which is independent of the memory system. This program is one of the "Cramden Utilities", and is supposedly similar to a program for the IBM PC of the same name. Larger numbers are better here.

SI	A	B	C	D	E
Versus A1000	1.0	4.6	4.6	4.6	4.8
Versus PC-XT	3.2	15.2	15.2	15.2	15.9

The Ronin BenchMark

The Ronin "CPU Speed" benchmark is another relative indicator. This is supplied by Ronin, and claims to be basically a test of CPU and memory speed.

Ronin	A	B	C	D	E
Versus A1000	1.02	1.94	4.42	1.93	6.09

FLOATING POINT PERFORMANCE

The Amiga provides two math libraries, Motorola Fast Floating Point and IEEE (68881 compatible) formats; some compilers also provide their own FFP libraries (since Amiga's FFP doesn't provide all the standard functions). While the FFP libraries are faster on an A1000 than IEEE format, as they're available as single precision and theoretically a better format for a general CPU to work with, under Amiga OS V1.3, the IEEE libraries will call the 68881 if it's present. This will speed up 68020 and 68030 systems in an upward compatible way, but still not give the performance of direct math chip calls.

The Savage Benchmark

The Savage Benchmark tests floating point function, including sin(), atan(), exp(), log(), and

(continued on next page)

Savage(16MHz)	A	B	C	D	E
FFP (Seconds)	[9.78]	5.30	4.40	5.60	2.60
IEEE (Seconds)	[46.44]	1.38	0.90	1.46	0.88
68881 (Seconds)	XXX	0.40	0.38	0.40	0.38

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Savage (24MHz)	A	B	C	D	E
FFP (Seconds)	[9.78]	5.54	4.34	5.78	2.56
IEEE (Seconds)	[46.44]	1.64	0.76	1.30	0.76
68881 (Seconds)	XXX	0.26	0.26	0.28	0.24

sqrt(). I ran one each for each of the Amiga math libraries, and one for direct 68881 calls. The 68000 of course does not have a 68881 on it. The smaller the number, the better; [] indicates that the 68000 machine doesn't have an FPU.

The MandelBrot Set

Mandelbrot(16MHz)	A	B	C	D	E
FFP (Seconds)	[36]	28	17	31	12
IEEE (Seconds)	[66]	30	17	34	17
68881 (Seconds)	XXX	3	3	3	3
Mandelbrot(24MHz)	**A**	**B**	**C**	**D**	**E**
FFP (Seconds)	[36]	28	17	31	12
IEEE (Seconds)	[66]	28	15	34	15
68881 (Seconds)	XXX	2	2	3	2

This is the time it takes to render a specific Mandelbrot "dragon curve". There are very many different versions of this program, the one used here is pretty simple, written in C, and uses real floating point.

Real Life Tests

The benchmarks done so far give you an idea of the raw performance of this system, but such raw performance may only be an approximation of real-life performance. Since these benchmarks were done on an Amiga system, they'll be quite reliable comparing Amigas to Amigas, since all the same code made with the same compiler is running in the same operating system on basically the same CPU. They also have some bearing on how well this particular set of Amiga tools compares to similar tools on an IBM PC or other machine.

Here I go through two tests designed to give you an idea of what an accelerator board is likely to do for you in some real applications.

Compiler Benchmark

Of of the big, time hungry applications you're likely to come across is compiling. Compiler speed is based on both CPU and hard disk speed, in most cases. There would be little if any floating point math involved in most compilations. For my example, I timed an automatic "make" of DiskSalv V1.3, which uses the Manx V3.6a C Compiler, and consists of 11 C files and one header file, which in turn includes 15 system header files. The basic A2000 and all other tests use an A2000 with 2 meg 16 bit FAST RAM Card, A2090A hard disk controller, and Fast FileSystem on a RoDine 45 meg hard disk. The results:

C Compiler	A	B	C	D	E
DiskSalvV1.3 (Secs)	378.22	312.12	188.22	341.17	175.19

Sculpt-3D Benchmark

Sculpt-3D (16MHz)	A	B	C	D	E
3D (Seconds)	570	422	295	XX	XX
3D8 (Seconds)	XX	115	81	120	76
Sculpt-3D (24MHz)	**A**	**B**	**C**	**D**	**E**
3D8 (Seconds)	XX	104	69	110	64

This test uses a popular real-world program that tends to be very CPU intensive. Sculpt 3-D is a ray tracing program, and it's available in a form that directly accesses the 68881 chip ("38D"), and one without direct '881 support ("3D"). The item traced is the Byte-by-Byte coffee cup, rendered in lores, non-interlace, photo quality, best antialiasing, and tiny image size.

CONCLUSIONS

It's obvious from the benchmarks that you should spend more money on math chips if your main job is ray tracing, image processing, or other floating point intensive applications, and more money on 32 memory if your main job is software development or other typically integer intensive application.

(continued on page 36)

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The Only Amiga Only

March 3 - 5, 1989
The Marriott Marquis
New York, New York

Ronin H2000 (*continued from page 34*)

While this Ronin configuration has it's flaws, it looks like a bit of editing on the manual and hopefully the proper memory jumper arrangement would set them straight. I know that the H2000 works OK, and appears to use something close to the Commodore-Amiga prescribed method for generating its 14.3MHz clock, so that looks like a reliable design. If you don't start with that, you aren't going anywhere.

Hopefully these tests give you a valid indicator of the performance improvement your dollars can bring. Depending on your actual applications and your operating style, your mileage may of course vary.

Ronin H2000
Ronin Research
P. O. Box 1093
Alameda, CA 94501
(415) 769-9325

CSA Update -

How is an apple like an orange? Well they are both fruits, both have skins, seeds, and contain natural sugars. Both grow on trees, and most importantly, both were sent by CSA to Amiga dealers, publications, and other developers. The fruit was accompanied by a letter from Bill Reed, Director of Sales and marketing for CSA which implied various inaccuracies in the September Amiga Sentry news report of AmixExpo Midwest. Come now, Bill, do you really think we didn't check for other tasks running? For those who missed it, we reported on an interesting event which took place across the aisle from our booth. Expert Systems is an Amiga dealer who thought that running side-by-side benchmarks of the Hurricane and CSA 68020 and 68030 products was a good idea. We thought so, too and assisted in monitoring the results. If you read our coverage of this event, you know how it begins:

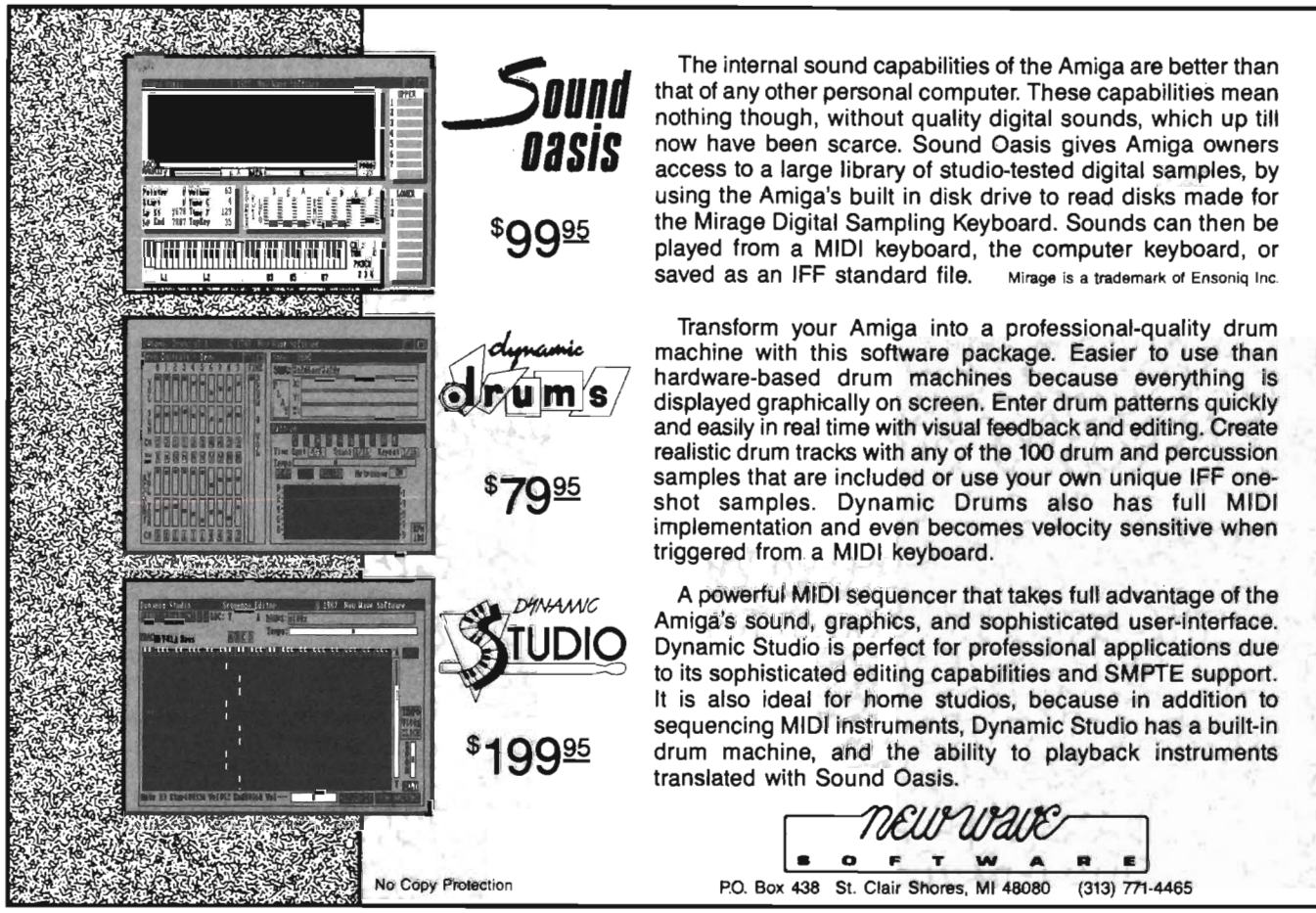
"The busy floor of AmiExpo Midwest is not an ideal spot for conducting performance benchmarks...."

Indeed, we recognized and stated repeatedly that these were not definitive, controlled benchmarks, but that they gave an indication that CSA has a real competitor in the Ronin accelerator. Mr. Reed also sent the Sentry a letter requesting a retraction or correction of the "distorted results." Soon after, I spoke with Mr. Reed concerning this issue. I've been in the computer business 15 years, many of them in sales and marketing, so I know how important accurate press coverage is. I agree that comparisions that can be confirmed could only be made with much more time and with expert supervision. We discussed the possibility of repeating this process using current CSA and Ronin products, and under expert supervision. CSA agreed to supply the Sentry with product, including the new DragStrip. We discussed the type of benchmarks which would be appropriate, and I began arrangements for collecting software which takes advantage of the 68020 and 6888X chips. Next we asked Charlie Crothers of Ronin for a similar "official" set of products. These arrived within days, as agreed and our testing began. Unfortunately, a week passed with no sign of the CSA products. I called CSA and found that they had apparently decided that "head to head" benchmarks were not satisfactory, and therefore, CSA could not supply the necessary products for the benchmarks.

Needless to say, we were disappointed, and a bit put out. Disappointed because we had hoped to bring you a detailed, experted conducted comparison of two high-end Amiga accelerator products. Since these kinds of products are easily in the $3000.00 price range, we feel it's pretty important that you get the straight scoop on which which product is best suited to your needs.

IBM, has held the position thatthat performance indicators are just meaningless indicators. Perhaps "big blue" can claim that its product is aimed at a blue chip market which values service, support, and perhaps even mystique over performance.

We continued on our project to get a general feel for what we were dealing with using CSA hardware that was available to us. Once again we plugged in both Ronin and CSA 68020 products with 16 and 25 MHZ 68881 chips. The CSA 32 bit memory product was the Fastpack which contains Kickstart 1.21 in ROM with just 384K of available RAM. The Ronin 32 bit memory board had a full megabyte of 32 bit DRAM. We were unable to locate the 68030 daughter board for the CSA product, so I'll have to confine myself to re-



porting on the 68020 versions. We repeated the integer math Seive with identical results. The CSA board was faster with 32 bit memory added (since static ram is much faster then DRAM this makes sense). We repeated the Mandelbrot test which uses floating point math and screen I/O. Here our numbers were different 35.4 for CSA and 31.3 for Ronin, but the pattern was the same. In this particular test, the Ronin was faster. This could be due to the Hurricane board mapping 32 bit memory into "normal" Amiga address space. With this configuration, the Ronin gains an advantage when portions of the program which do not use the math coprocessor chip run at 14.2 MHZ. Finally, we repeated the most meaningful test using the Sculpt 3D version for 6888x. It was this test which showed the most unusual result at AmiExpo. We repeated it many times there and came up with consistent times: 150 seconds for CSA and 59 for Hurricane. In our news report we pointed out that this lopsided result did not hold true in the 68030 configuration.

When we repeated this test the results were different. The CSA board actually beat the Hurricane 67 seconds to 69! Like a good tester we tried many times with similar findings. Perhaps a different version of Sculpt? Something wrong with the hardware. We explored this phenomenon further and found that the CSA fastpack is not autoconfiguring its 32 bit memory like the Hurricane did. It requires a special addmem command to activate. When we left off this command and ran the CoffeeCup test again our results were like those at Chicago. Apparently, this section of memory was not activated when the brief testing on the Ami-Expo floor was completed. When the machines were shut down to switch to 68030 CPU's, it was activated by the startup-sequence. Its just a shame that CSA backed out of our agreement to present you with much more comparative information. We would have liked to examine other merits of the CSA board in detail, under the same controlled conditions. Hopefully, CSA will reconsider.

All is not lost though. See the detailed review of the Ronin products in this issue.

Major Motion...

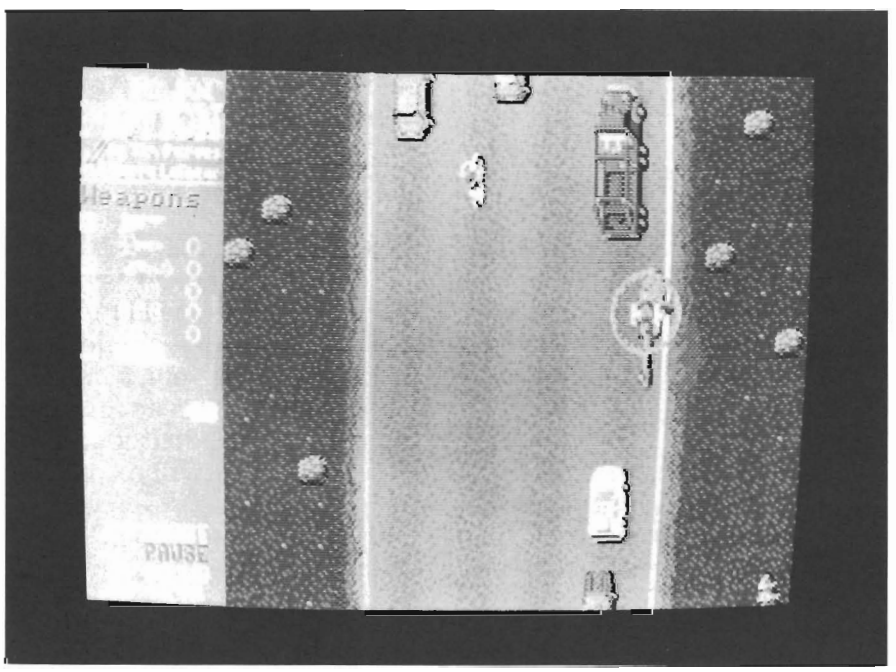
What a Feeling!

by Steve Ushioda

Speeding down the highway in a weapon loaded sports car, you, Major Motion must rid the roads of the lawless "Draconian League", while protecting all innocent citizens. This is the mission handed over to you by "The Firm". While not very original, it is certainly an exiting scenario for Major Motion, a new driving/shoot- em-up game from Microdeal. The general gameplay is simple. You steer and accelerate your car with either the joystick or mouse. Frequently, weapons used are controlled by the trigger or mouse buttons, while less used ones are activated by user definable keyboard commands.

Forward mounted machine guns are the only weapons you are supplied with at the start of your mission, but more are on the way from "The Firm's" weapons truck. The truck comes every few miles and gives you a new gadget each time you can successfully make your way inside it. Extras like oil slicks, smoke screens, anti-helicopter missiles, and turbo boost can save you in many dangerous situations. The view is from high above your car so you can see cars ahead and even slightly behind your position on the road.

The idea in Major Motion is to keep from getting bumped, trampled, or generally mangled by the other less than courteous occupants of the roadway



There are quite a few varieties of "bad guy" and "good guy" cars that you will face along your mission. The Draconian League cars are usually blue or grey, while law abiding citizens come in all other colors. The most common League car is the bullet-proof sedan. Another similar car is the antique bullet-proof roadster. Both of these cars require you to bump them off the road rather than blasting them with machine guns. The two other common baddies are the tire slasher and the generic Draconian car. Both of these can be defeated with bullets, but if you get too close to a slasher, he will burst your tires and start you sliding off the road. The Draconian League also has a few "special" enemies in store for you. The attack helicopter makes deadly potholes by dropping bombs in front of you. It

can only be destroyed with missiles received from the weapons van.

A couple of other, more powerful cars appear as you progress, but they are better left as a surprise. Some civilian cars include taxis, sedans, station wagons, and even motorcycles. Most civilian cars will to get in your way. However, the real danger is, if you destroy more than one of them, The Firm will think you've turned to the dark side and send one of their jets after you. At a certain point along the mission, something drastically changes. If you can get far enough, the road changes into a river! All cars, including yours, become boats that bear only a slight resemblance to their automotive counterparts. Most of the mechanics here are the same, except that there are more obstacles, and the enemy boats can drop mines!

The documentation is mostly in the form of a mission briefing. It does a good job of explaining thegame without getting too wordy. There's no denying that Major Motion is an action packed game. Your car responds quickly to joystick or mouse movement. The graphics are fair, but the digitized sound is great. There are many small, but nice features. For example, when you shoot a car that is vulnerable to bullets, it bursts into flames, still rolling, until it comes to a slow halt (instead if just disappearing). Also, the limit on how many civilians you can "accidentally" destroy without being terminated is a good idea. There are a few areas of Major Motion that need some improvement. First of all, the scenario is taken directly from the popular arcade game, Spy Hunter. This could be a very serious drawback if there were already an Amiga version of Spy Hunter, but fortunately for Microdeal, there isn't. Gameplay can become too repetitive after you've mastered a basic strategy of bumping and shooting. It is also practically impossible to bump an enemy off the road while you are using the joystick.

Finally, the use of the joystick/keyboard is awkward in such a fast game, because it forces you to take your finger off the trigger to use any special weapons (a problems that can be handled by using precision movements with the mouse).

Despite these complaints, I found playing Major Motion to be a overall fun experience. It has the action, graphics, and sound to make it suitable for both Spy Hunters and Motion Majors.

Major Motion

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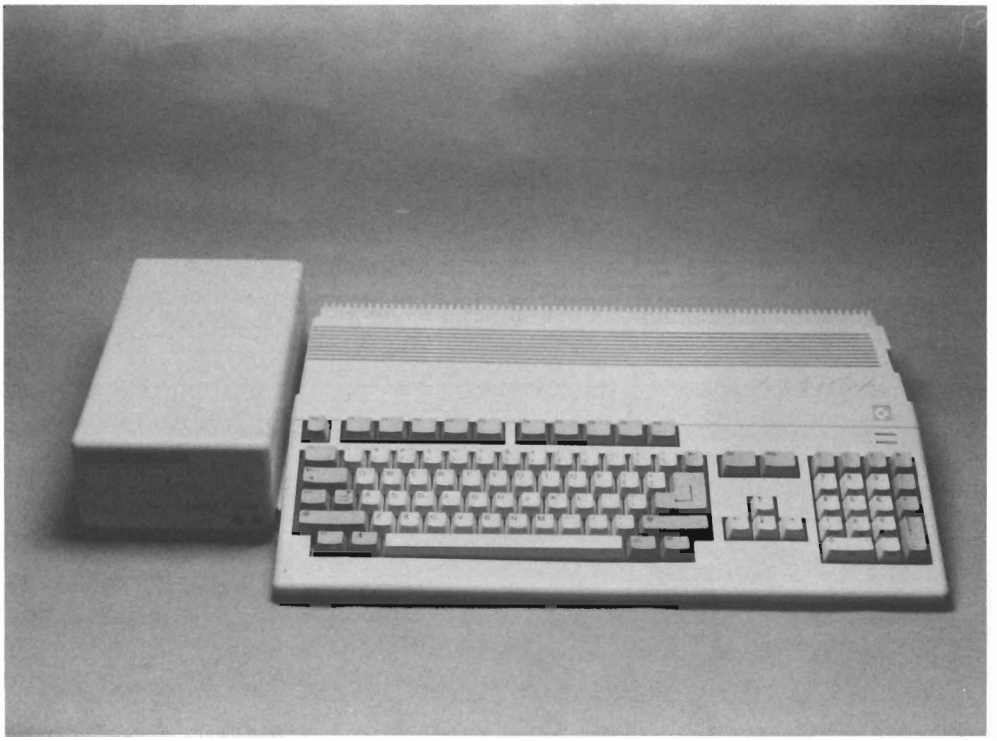
IMPACT 500

A high speed hard disk/memory expansion unit from GVP

by Steve Dock



Impact 500 is a new expansion chassis for the Amiga 500 that gives 500 owners access to an optional two megabytes of fast RAM, and as many as seven SCSI devices. This is GVP's entry into the A500 expansion market, and uses the same controller technology as their 2000 products. The unit consists of a small box that sits on the shoulder of the 500 and plugs directly onto the expansion bus. The expansion box gets power from its own power supply, which comes with a convenient long cord. The box itself is a simple looking tan metal case with smooth, rounded edges. Inside is a fan for cooling the optional memory board and SCSI disk drive (the fan is well placed and draws air from openings in the front of the case across the board and drive). All this looks deceptively meek, since you can place a hard drive of up to 100 megabytes inside!

Inside the chassis is space for a single 3.5" SCSI drive which you can order in sizes ranging from 20, on up to 100 megabytes. The model GVP supplied us with is the 40Q, which uses a very fast 40 megabyte Quantum drive. We also looked over the optional add in daughter board that has sockets for either 0 or 2 megabytes of fast RAM. This board also has sockets for the ROMs that are needed for autobooting (this must await Commodore's release of 1.3 Kickstart ROMs "any time now"). Not coincidentily, the autoboot ROMS and support for the Fast File System will be released by GVP to mesh with the official release of the Enhancer 1.3 package from Commodore.

Many 500 owners have little experience with hard drives. Fear not, installation is very easy. All you do is remove the plastic door from the side of the Amiga 500, place the GVP Impact box along side, being sure to line up the connectors, and push the two together. The pres-

sure required to complete this is less than to connect to the A1000 expansion port. Now find a place for the Impact power supply to plug in. GVP recommends hooking the power supply for the expansion box and the Amiga power supply into a single switched power strip, preferably one with a power filter. I concur, since starting your 500 before or after turning on the Impact500 will result in an unsuccessful boot.

I was especially curious about using the A500 expansion port. I had been told many stories about possible RF interference, lack of stability, and overheating the motherboard. The connector on the GVP side is well protected and surrounded by the metal of the case. It is constructed so that the joint is firm and free from flex and strain, in the event that the computer or the expansion box is bumped (but don't try to pickup the 500 using the harddrive box as a handle!). By using a separate power supply, GVP eliminates potential overheating on the 500 motherboard. However, I did notice a very warm case on the power supply after leaving the unit on for a while.

It was at this point that I decided to bring out my RF analyzer. It's definately seen some better days, but it still displays a pretty mean "I Love Lucy." You guessed it. My RF analyzer is actually an old Black & White TV with a stub of an antenna that knows whenever I have my A1000 with SupraDrive turned on. Once I had the Impact installed and powered up, I turned on my "tester." The interference was less than that which resulted when the A1000 setup was activated. Although this is by know means a conclusive or approved procedure for RF leakeage detection, interference to neighboring appliances is what the FCC regulations are all about. We should also note that the Impact chassis doesn't pass the 500 bus. This may be a limitation for some, so keep your future plans in mind when deciding if the Impact setup is for you.

With hardware installed, its on to the software. GVP supplies a booklet style manual which covers the 2000 products as well as the 500 model. A short chapter describes hardware installation, and then you skip many pages to find the software chapter. There are no pictures in the otherwise well organized manual; an inclusion I would have thought most helpful for the uninitiated in terms of setup and orientation. The installation software is very easy to use, however. Like a floppy, a hard drive must be formatted. But first, Amigdos needs to know about its existence, and this requires things like mountlists, binddriver, etc. Most buyers of the Impact 500 can forget all about these details. Simply boot your machine from the supplied disk. This will handle it all; preparation of hard disk, formatting partitions, and creation of a boot disk for continuing use. The whole installation process prompts you step by step and can operate completely from Workbench. This is a real plus since no knowledge of AmigaDOS or CLI is required to install the drives or create additional boot diskettes. For those of you who want to tinker with mountlists, there is a GvpScripts directory

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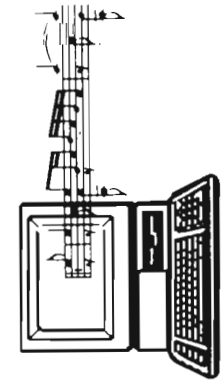

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Impact 500

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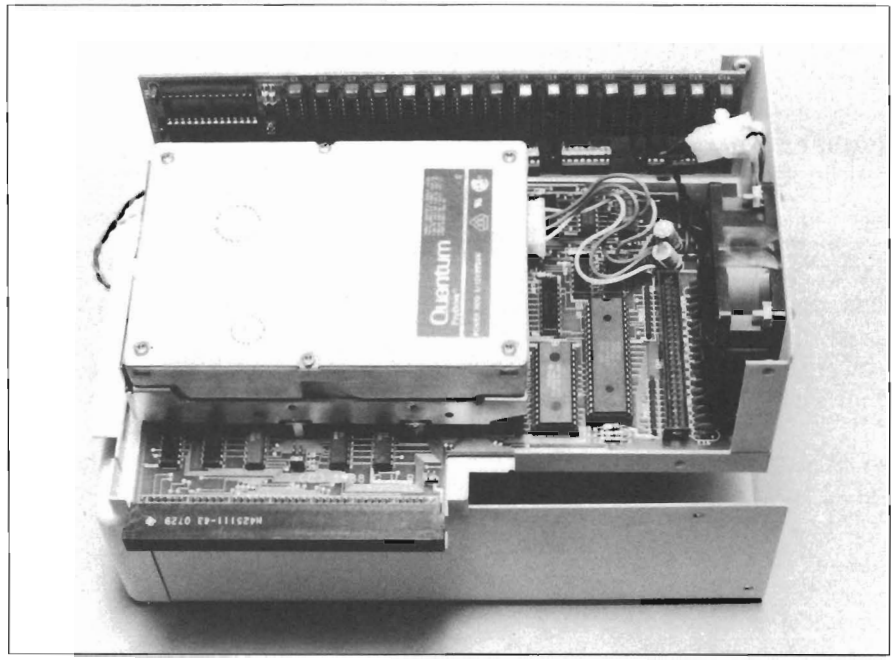
with many script files which can be used as guides.

One thing that we noticed immediately during the format process is the speed of the Quantum and GVP controller combination. Compared to the SupraDrive on our A1000, the GVP setup is absolutely "turbo-charged." All of this speed shouldn't come as a major surprise since the Quantum drive is a 19 millisecond access unit with a 64K onboard cache. The GVP controller also includes on board static RAM cache of its own, resulting in an effective access rate for this combination of 11 milliseconds.

I conducted several tests of speed and confirmed that in mos AmigaDOS operations, the GVP and Quantum combination is four times faster than a floppy disk under 1.2, and close to 13 times faster under 1.3 Fast File System. The results were slightly lower than the results reported for the GVP hardcard in the July 1988 Sentry. The slightly slower result probably comes from the lack of fast RAM on the Amiga 500 bus (all 1 meg of RAM on a 500 runs at the slightly slower CHIP ram speed).



With cover removed, a view of the Impact 500's interior reveals the memory expansion module installed with sockets for autoboot ROMs.

Overall, I'm impressed with this product. The Impact system brings a great expansion power to the 500.

Impact 500

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Modeler 3D

Aegis' Aspiration for a Better Object Creation Method

by Paul R. Miller

After the thrill of electronic painting, the second most exciting experience I had with the Amiga was when I first booted VideoScape 3D. The sheer wonder of being able to create and view three-dimensional objects is still astounding to me, and is a valuable aid in my work as an architect. Like most users of Videoscape, I used the "EGG" utility to create and play with simple symmetrical forms, and I tried to utilize the "ROT" program to make the kind of objects that populate my professional world. After many frustrating sessions, I resorted to the manual method - text editing object coordinates. After awhile, I got used to it. It was just a matter of making careful sketches and being meticulous in the recording and entry of coordinate points and the clockwise point numbers of polygons. I was eventually able, with the help of the OCT utility, to make fairly complex objects and environments. However, I never achieved great comfort in creating motion and camera files. When Sculpt 3D appeared on the scene I was, of course, impressed by the beautiful ray-tracings, but my real desire was to work with the "extra simple" tri-view interface. Suffice to say that I quickly returned to the world of VideoScape and text editing.

By nature and by training I am used to working in three-dimensions, and am comfortable with multiple projections. But here I am with 2 dazzling programs to display and animate solid objects, yet forced to make isometric sketches and then enter long lists of numbers! And what about users who had no experience in technical drawing? What's was needed was a good object editor. Something that would combine the tri-view projection windows, allow accurate entry of points and lines like a CAD program, and give a perspective or isometric preview all at the same time. After many rumors, and much waiting, Modeler 3D is here.

First off, hooray to Aegis for going back to spiral bound manuals that you can actually use. However, it does have yet another addendum and errata sheet. Also, a mistake in the tutorial was missed both in the main manual and on the errata sheet! Fortunately, the program is so well organized that you can make your way in spite of the errors. The manual gives explicit instructions for system requirements and set up. It follows with a general description of the program's structure and terminology, and then plunges into a "complete tutorial". The tutorial touches on just about every aspect in one project; from object creation to making a camera motion file. The tutorial is easy enough, and the results are impressive. In it, you create a barn, add a silo, and then make a walk-around camera view, and play it back while multi-tasking with VideoScape. When you're done, however, you will have only followed a set of step-by-step instructions without really understanding why you are doing what you're doing. Push on and read through the chapters on tools, universal, direct and special commands, and then go back and practice. The manual contains a profusion of screen shots (with before and after views) to illustrate just about every command. This almost eliminates misinterpretations caused by unfamiliar jargon.

Although Modeler makes making 3D objects about as easy as I

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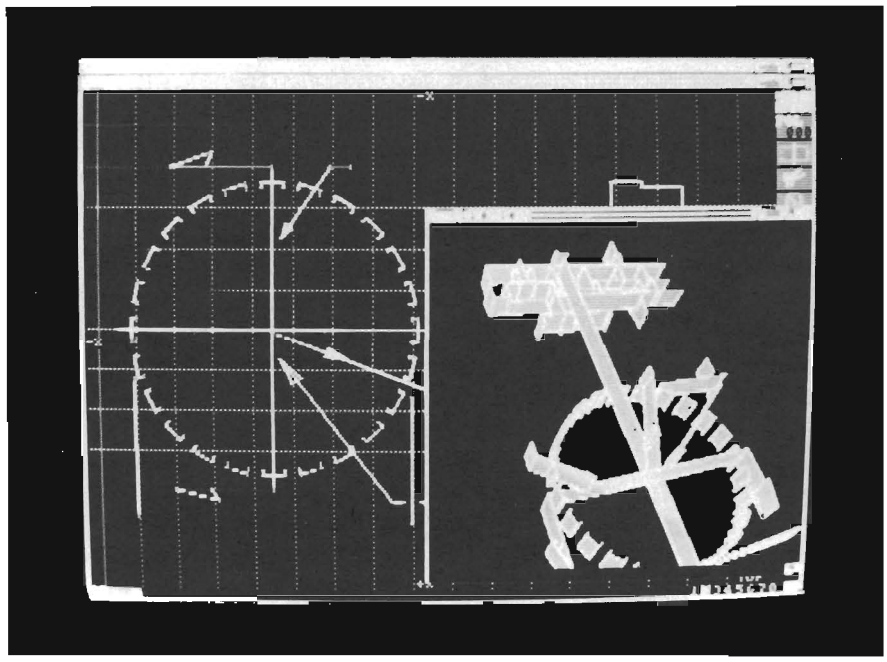
can imagine (almost intuitive), the 3D world is still not a piece of cake and will take some effort. If you want an appreciation of how much easier Modeler makes this effort, try constructing a simple one-point perspective by hand. This is the method used by Renaissance artists and still used by non-computer artists. In the amount of time a single drawing takes, you could have mastered this program.

M3D requires a minimum of 512K, but really needs as much memory as you can afford to be used seriously. With the advent of M3D, Aegis now has an integrated family of programs from CAD to 3D object editing; from rendering and animation to video production. With a hard drive and enough memory, you can combine DrawPlus, Modeler and VideoScape in a common directory, and go back and forth or multitask at will. Modeler is the key here because you can load 2-dimensional vector files created in DrawPlus, extrude and otherwise manipulate them into solid objects with Modeler, and load them into Videoscape for rendering and animations. If you have access to other CAD files from mainframes, you can also use A-Talk Plus to transfer them into a DrawPlus vector file, and then into Modeler. Modeler has built-in support for the 68020/68881 (Aegis claims 50 to 70% speed improvement), works with PAL video, and will support the new plotfile format of Draw2000. Draw2000 will be available "soon" with an upgrade policy for registered owners of Draw and DrawPlus. M3D is also compatible with Sculpt 3D, so you can import objects directly and export files using InterChange.

Modeler 3D's work screen



This gives you access to ray-tracing when you need photographic realism and shadows.

When you boot M3D, you're greeted with a very professional looking screen of three gridded views on a black background. On your right is a row of tool icons and on the lower right is a blank space for a preview window. This window updates as you work. There are also several indicators that show layers, cursor X,Y, and Z coordinates, the scale you are working in (from nano to giga meters), the number of dimensions you are working in, and a "lock plane" gadget.

The default resolution is hi-res interlace, and with a flicker fixer, the display is superb. (My thanks to the designer for not including any "cute" or animated gadgets). You really need to be in high resolution, but don't despair if you lack a de-interlacer, just adjust the screen colors to get rid of the flicker. I suggest dark gray for background and amber for lines. There are four types of windows available:

Projections or tri-views of objects where you work in three dimensions. You need to enter points in at least two views to establish the x,y and z coordinates.

Templates, which are 2-dimensional windows and allow quick construction of points and polygons in a plane. Here you only need to enter a point once. Template is the window you will utilize for extruding or lathe (spinning) operations.

Previews, which are three-dimensional views of your objects. Normally, you would use the standard preview, which renders in two colors for speed and

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memory conservation. This mode can be on screen, along with the projection or template windows. Preview responds to layer options, and will display only what you want to see. You can further select and save your preferences for solid or wireframe, and full, ghosted, or non-existent back faces of polygons. Color Preview mode will display objects in all the available colors (with similar preferences), but is slower and temporarily closes down your other windows.

You can zoom in or out on your preview, and move your camera by clicking in the window to indicate the direction you wish to move. This takes a little while to master this control. Basically you work from the centroid of the object, and the farther away you click, the greater the amount of rotation.

Finally, the Statistics window lists information about the current foreground layers of your template or projection windows. This includes the total number of points and polygons, a breakdown of quantities of 1, 2, 3, 4 and greater than 4 point polygons, and the number of polygons in the current default color. Statistics is handy for finding those inadvertent cases of one-point polygons you may have created by mistake, and which aren't visible.

The Tool Bar offers 3 modes of operation and 8 actual tools. Modes select what your operations and commands affect. Point Mode involves the creation, deletion, and movement of points. The movements include translation, scaling, rotation, and remapping. If you delete or move points that define polygons, then, of course, you also delete or move those polygons. Polygon Mode limits you to creation, deletion, coloring, "flipping" (i.e defining which is the visible face), adding or deleting vertices, and splitting or merging. An example of a split would be converting a rectangular face into two triangles. A merge would be just the opposite. One of the key advantages of the VideoScape approach to objects is being able to make polygons other than triangles. Wireframe previews are a whole lot easier to see without a maze of internal triangles. The final mode is Volume, which involves both

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points and polygons. By dragging a rectangle, you enclose a volume within which your commands will take effect. For polygons, volume mode can be inclusive or exclusive (i.e. a polygon which lies partly outside your defined space can be included or not).

With respect to object creation Modeler 3D has three major types of commands: Universal, Direct, and Special. Universal commands are mode dependent, which is to say that they will operate on selected points only in the Point Mode, selected polygons only in the Polygon Mode, or both points and polygons as defined in the Volume Mode. Universal Commands are accessed via pull-down menus or keyboard commands and include:

Delete, Cut, Copy, Mirror, Array, Change Color, Rotate, Translate, Scale, Remap, Merge Points (eliminate redundant points that result from cut and copy), Quantize (snaps points to the grid), Translate to Center, Merge Distance, and Set Center.

Direct Commands operate independent of mode and are effective only on those points or polygons selected, and then only insofar as they are appropriate to the objects selected. They include:

Select Points/Polygons, Set Point, Point Info, Polygon Info, Set Color, Flip, Merge Select, Vertices, Remove/Insert Vertex, and Default Color.

Special Commands operate only from the 2-dimensional Template window, and are those which allow you to convert points, lines or planes into 3-D objects. Lathe spins objects around a defined axis, according to your selections for starting and ending points and number of segments. This is nicely represented in the requester window by a "wheel" view diagram that updates with your settings. Depending on what you spin, you get different results:

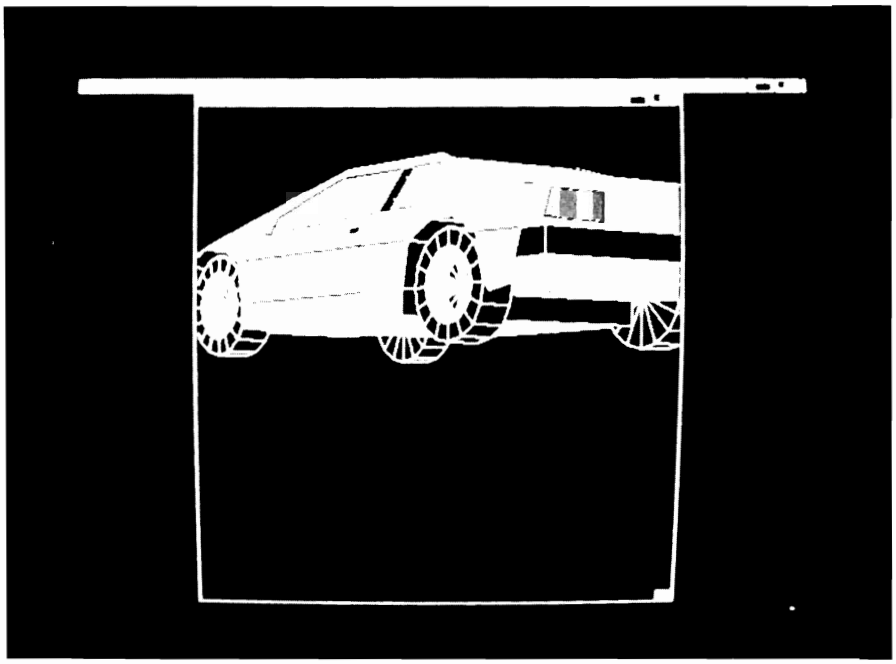
Points yield circles, Lines yield surface polygons (hollow cylinders), and polygons yield arrays (i.e. a rectangle would spin into a series of planes around the axis, like the pages of an opened book).

Extrude works in a similar manner, except here you specify length and number of segments. Again, the results will depend on the object being extruded:

Lines (unselected or selected) will yield hollow extrusions with sides or layers of themselves at each segment. Polygons (unselected or selected) yield a shape with filled ends but empty sides, or layers of planes with no sides. For quick generation of solid objects from planar forms, M3D offers Simple Extrude, which automatically yields enclosed volumes from surface polygons (i.e. a rectangle makes a box). With each of these commands, you control the scale of the operation (independent of the scale in your template window) and to which layer you want the output directed.

Meanwhile, back at the main display, the remainder of the Tool Bar offers buttons for direct object creation:

Add Point--to enter points;



You can view your recently created masterpiece from various angle by using the numeric keypad

Curve--to create a series of connected lines (which are two-point polygons);
Add Polygon--which operates on previously created points, and defines the outward, visible face (you can also make two-faced polygons);
Move Point--which shifts selected points by clicking and dragging;
Pan--which scrolls the screen;
Delete-- anything selected;
Cut--which removes the part you select to another layer; and Undo.

In the lower right hand corner are displayed the eight available layers, with indicatiors for which ones are currently active. Having multiple layers is a major help in working your way through the complexities of solid objects. M3D lets you focus your attention on segments of space without the distraction of multiple superimposed planes. You can then recombine those layers when you are ready. Best of all, you can superimpose background layers for reference. Backgrounds appear in light blue behind the white foreground. On the left side is the lockplane gadget and the grid indicator. Since each point requires 3 coordinates to become "real", you need to click in at least two projection windows to establish a point. Like Template, Lockplane allows you to freeze one of the axis (yet still work with 3 views) and simplify point entry to one click. The grid gadget reads out your present unit of dimension and the size of your grid, as well as toggling cursor coordinates. To set your scale, call up the Grid Requester and enter units, grid size, and the amount of "snap". You can specify grids in either absolute units or fractions of 1/10, 1/5, 1/2, or 1. M3D works in base 10 metric scale to be compatible with VideoScape, but you can easily convert metric objects to another frame of reference with global rescaling when you are all done.

The next category of commands involve input and output from M3D. *New* clears the memory and starts over. Open Object allows importing of VideoScape objects, of course, but the real bonus comes from importing Camera and Motion files. Modeler 3D converts these to objects, so you make and edit motion visually! Just put your object on a background layer and plot

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Modeler 3D *(continued from previous page)*

your movement path. Bonus number 2 comes with loading Draw, DrawPlus or Draw2000 vector files. If the tools in M3D aren't sophisticated enough for your planar editing, you can now use a CAD program, plus you can utilize all your existing files and anything you can import from other CAD systems. Open Plot allows importing plot files and curves and splines (M3D includes the Modeler.plotdriver that will ship with Draw2000). Open Sculpt 3D lets you import .scene format files from this popular package. Finally, Open *New Palette* lets you substitute an alternate 16 or 32 color group (just like VideoScape 2.0). When saving, you have the choice of storing objects as text or binary. Objects can also be saved as motion files, or you can save your foreground projection, template, or even preview, as a Draw vector file.

Making motion now has become a whole lot easier. With your object in the background, you use the curve tool to set down vertices representing key frames in order. You can then set the number of tweens for each segment of the path. When you go to save this "object" as motion, M3D lets you specify object or camera angle (heading, pitch, bank), track (point at) a fixed point, be tangent to the path, or track another motion file.

Save Settings lets you choose your default working preferences for Screen Type, Colors, Window Orientation, Scale, Grid, Previews, etc. The manual states that you can save Preview Window size and position, but this didn't work. A call to Aegis confirmed that this feature wasn't yet implemented.

The last set of commands involves display parameters: Zoom factors for keyboard commands or manual object framing; Auto-Scale (sizes your window to fit the object automatically); New Windows for projections, templates, previews; Coordinate display; Orientation of view (i.e. front vs. back); Visible (points, polygons, details, grid, axes, labels, and "normals"). Normals are he handy indicators of which polygon faces are visible.

Modeler gives you a complete set of keyboard commands, plus combinations with the Shift and Alt keys that add layers to the display, and otherwise speed things up for the seasoned user. Want more? You can assign window parameters (zoom, scale, etc.) to the function keys for quick recall. The manual also revisits issues of three-dimensional thinking in helpful appendices, gives some advanced user tips, and summarizes the VideoScape Color/Surface options in a matrix. There's even an Erratum tip for combining shade types (i.e. smooth glossy black [144] is the numerical sum of smooth black [128] plus glossy [16]).

The good news is that Modeler 3D is finally here and it has all the tools you need to make objects, move them about, and make a way of viewing them. It supports and works with both Drawing files and VideoScape and, thanks to the affordable power of the Amiga, lets you multi-task with both formats. Imagine the orders of magnitude of more dollars you would have to invest to achieve this with MS-DOS or the MacII, and you'll begin to appreciate the value of this package of products. Until now it was frankly not very easy to work with solid objects. Sure, we had VideoScape and Sculpt to do spectacular renderings and movement, but moving beyond the realm of graphic primitives and cute effects involved considerable time, effort, and obsessive concentration.

For those who need to make their computers work in a real world, Modeler 3D is indispensable. With no more effort than it takes to conceive and organize the objects you need to represent, Modeler gives you the tools. The bad news is that now there are no more excuses. With some room for improvements and refinements, a combination of 2-dimensional drawing, 3-dimensional object editing, and rendering/animation programs exist, that ought to produce a wealth of business and professional applications. Although I'm looking forward to more speed from a coprocessor and 32 bit RAM, more chip RAM and maybe more colors from Commodore, what we've got right now is sufficient to get to work. I'll have to refrain from nagging Aegis for a bit while I produce some work (although I wish they would fix VideoScape so it plays anims in interlaced HAM without crashing)....

Modeler 3D $99.00

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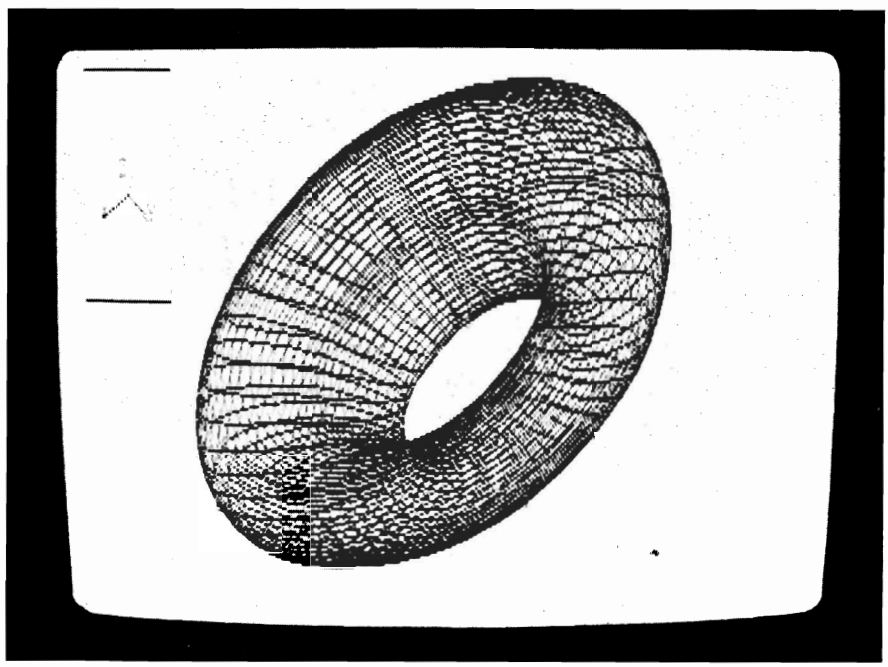
Forms in Flight II

3D graphics and animation revisited from Micro Magic

by Paul R. Miller

Forms in Flight II is a complete 3D modeling and animation program on one disk that offers most of the key features we have come to expect, plus some additional capabilities that are novel. In fact, the whole approach of FFII is novel in the manner of the creation of objects from building blocks of "FSURFS" and "QSURFS". Coming to this program from the world of VideoScape and Sculpt 3D, I must admit that I was not comfortable with the concepts of object generation that FiF2 employed. However, I was immediately impressed with the striking quality of the smooth surface renderings, the speed with which they are generated, and the power and diversity of the animation effects. Without resorting to the HAM mode or ray-tracing, FFII produces "Phong Shaded" forms that stun the eye. Equally amazing are the effects from texture mapping. Any IFF file (up to 15 at a time) can be mapped onto the surfaces of objects. This is somewhat analogous to the texture mapping of Photon Paint, but with unlimited flexibility of form and much smoother mapping. The standard features include IFF foregrounds and backgrounds, extrusion of 2-d into 3-d, hierarchical motion paths in animation, 2 and 3 dimensional editing modes, and multiple window views of objects.

Wire frame mode on Forms in Flight II



Forms in Flight II comes with 2 disks, the *Program* disk and a *Sample* disk of objects to accompany the tutorial examples. We also recieved three demo disks of finished animations of varying complexity. In addition to the Editor Program (wherein you make and animate), FFII provides a player program, Fast Flight 2, which is required to view your animations. This player can be freely distributed with your finished products. FFII requires a minimum of 1 Meg of RAM, but you'll need 2 Meg or more for complex work and for multi-tasking the editor with the player. Micro Magic provides a loose leaf binder manual with some illustrations,

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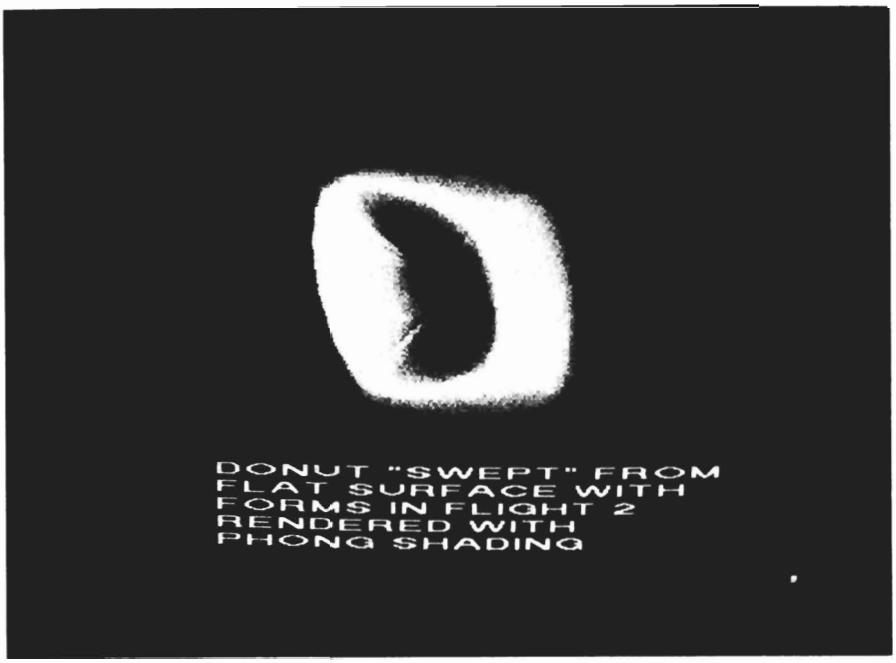

The rendered version exhibits FFII's ability to create realistic shading

but mostly words. The manual contains: An Introduction, with installation instructions; a batch file to install on a hard disk, a brief description of the wonderful world of 3-d coordinates, and a quick preview of objects and animation files; a chapter on Objects which introduces the concepts of FSURFS and QSURFS, and takes you through some simple exercises; six more chapters that introduce you to successive layers of commands and object manipulation, culminating in Animation techniques. Finally, there is a chapter that traces the production of the Demo Animation included on the master disk.

The key to the uniqueness of Forms in Flight is the construction of solid forms out of the two types of surface primitives: FlatSURFaces and QuadSURFaces. In other nomenclatures, these are called spline curves and surface patches (CAD users will recognize the former). They are the basic building blocks of FFII's three-dimensional universe. An FSURF is a 2 dimensional object, consisting of points which are joined by a line which can have varying degrees of curvature between the points. The curvature can also be straight. FSURFs can be open or closed, depending on whether the line closes back to join itself at the starting point. QSURFs are three dimensional surfaces made with 4 points, hence the "quad" in the name. The curved lines which join these 4 points form the spatial boundries over which the surface skin is layed. Imagine four separate pieces of bent wire joined end to end at four swivel points. Now imagine a piece of fish net layed over the wire frame. This "surface patch" defines a three dimensional skin and is what you see in the wireframe mode of FFII editing. The fish net can be small or large in scale. A small scale gives a smoother surface. The curved wires can vary their degree of curvature and orientation. With a patchwork of these surfaces, you define your solid forms in varying degrees of complexity. As the basis of FFII is curved segments of space, it's not surprising that it excels at rendering these curved planes. It's quite different from the point and line approach of other programs I've used, and not at all easy to articulate. Perhaps a brief narrative of a typical object will give a real flavor for the techniques.

When you activate the program icon of FFII you get a title screen which contains an IFF background and a QSURF. A requester lets you clear the background and then you have to open a new project to clear the QSURF. This gets tiresome very quickly, and I wish they'd eliminate this feature on start up. FiF2 takes another non-standard approach with the menu structure. Instead of the usual pull-downs, a right mouse click gives you a horizontal array of nested choices with the following major headings: PROJECT, PERSPECTIVE, RENDER, CREATE, MODIFY, ANIMATE and PREFERENCES. As you move the cursor arrow over these headings other option nests appear to their right, with additional nests appearing as you progress with your selections. As FFII doesn't provide any keyboard equivalents (only F1 to repeat the last command), *all* commands must be issued with this system. This is,

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for me, a rather awkward interface (a slight misalignment highlights the wrong item), and the combination of the horizontal menu and the unfamiliar terminology makes for a slower learning curve.

Enough about the menu, what about making objects? The tutorial example that produced the stunning shaded donut involved the following procedure:

Working "Render/Mode/Wire", we set the resolution and color requester to 640 x 400, with 4 colors. FiF2 supports all resolutions and overscan, with color choices from 2 to 32. Next, we make a simple Closed FSURF with 3 sides. You set your "Perspective/Dimension" mode to "2DXZ" (looking down), and set "Render/#Sides" to 1. The number of sides determines the mesh of your fishnet surface or the number of segments in a curved line. Now "Create/FSURF/Closed." Point and click three times, with a right mouse click to close the figure. A triangle will appear. Next transfer to the XY dimension. Your first figure will appear as a line now, as you are seeing it from the edge. Now make another Closed FSURF, this time with 4 points. This second FSURF is made so that it passes through the first, and will become a path for "sweeping" the first into a 3-d shape. This is rather like a spin or lathe operation in other programs, but here you can work with a path or revolution that isn't a pure circle. You make the second figure a path by selecting it ("Create/Select/Box Around"), then converting it to a path ("Modify/Curve/Make Path"). The control points of your second figure become numbered in sequence. These numbers become operative in setting the parameters for your "sweep," and they also figure in animation sequences, as paths can define object movement as well. Next, you execute a "Create/Select/Swap" command sequence (to deselect the path and select the first surface), followed by "Create/Sweep/Along Path." Clicking the numbered control points determines the extent of the sweep. Requesters appear to eliminate duplicate modes, set tolerance, and eliminate duplicate curves. What appears on your screen is an overhead view of the swept surface, and, in this case, an array of four of these surfaces joined by lines from point to point. Next you delete the path by selecting it, then "Modify/Delete Sel(ected)".

Further command sequences allow you to move the object to center it on your screen, and to magnify the scale of the object. At any time you can change the number of sides to increase the smoothness and roundness of your object, or go to a 3-d view to preview. You will want to keep the number, of sides a low number except for preview purposes, to speed operations. The final steps to rendering a smooth shape involve resetting your resolution to 320 x 400 and increas-

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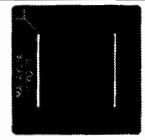

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ing the number of colors, say 16, in preparation for smooth Phong shading. Reselect your object ("Create/Select/Everything") and execute "Modify/Color". A color palette and requester box appears, wherein you set a range of colors. Then modify your colors with sliders to make a spread of light to dark in one hue. Your goal here is to make a range of values that will render your smooth sided object with a natural spread of values to emulate the play of light on its surface. FiF2 limits you to one light source, with default location behind the viewer, and shading only with plain colored surfaces (i.e. texture maps aren't shaded). Finally, set the dither range within the range you have already established for your shade colors. If you had used 8 shades originally, the dither range transforms the effective shading now to 70.

A few more steps and you'll be ready to render. Deselect everything, then select only QSURF's. This eliminates anomalies in shading caused by residual FSURF's inside the donuts (those 4 points on the sweep). Now execute "Render/Show/Selected" so you only display the curved sides of the donut. Raise the number of sides, and command to "Render/Mode/Shaded." A few minutes, and you have a picture that is nearly photographic in realism, with amazing depth and subtlety of shading.

A key element in the animation process involves the creation of FSURF paths. This is similar to creation of the "sweep path" created to make the donut. Additional requesters and commands allow you to define Frame Blocks for objects that specify starting and ending frames, object acceleration and spatial orientation, dynamic alterations in object size and "roundness", surface texture maps, camera position and viewpoint, and hierarchical motion. In a hierarchy, the objects are defined as "fathers", "sons" or "brothers". Although parent, child and sibling might have been less sexist, the metaphor is aptly descriptive. Sons move along with their fathers (there can be many levels), but brothers movements are independent of each other. All in all, the animation tools are comprehensive and allow fairly simple scripting of complex motions.

My major question with FiF2 is this: Is it worth the effort of working through these steps, and what are we trading off for these effects? Compared to other 3-d programs we are limited as to light sources, surface texture (true, we have mapping, but without shading), and we must define color ranges to achieve our shading. Further, we have the another animation file standard which doesn't have the convenience of intergration into some of the desktop presentation programs. And there's the matter of editing objects with a somewhat less than intuitive object, the surface patch and the spline curve. As a stand alone program, I think that Forms in Flight II is probably less useful all around to the average user than, say, VideoScape, because the latter deals better with more ordinary objects for most of our needs. But no 3-d program yet has all the bases covered, and we Amiga users should be thankful for the present and ever growing profusion. FFII's Phong shading and texture mapping are truly outstanding, and the animation capabilities are formidable. Thanks to Interchange and 3-Demon we can use other object editors if we don't want to embark on a new learning process, and transfer the results to FFII to take advantage of its strengths. Until some programming genius combines all the features into one unified package, I'll gladly use the various programs for their own best applications.

Forms in Flight II

Micro Magic
261 Hamilton Ave.
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(415) 327-9107

Amiga with
1 Meg Ram minimum

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UniDrive

A "Drive" to Succeed

by George Rapp

Memory and Storage Technology (MAST) is a relative new comer to the Amiga Hardware market in the US, but this Australian based company made an appearance at the July AmiExpo in Chicago to help promote its products and office in Pheonix. One product that is currently shipping is MAST's alternative to the Amiga 1010 external floppy drive, called the Unidrive.

The Unidrive is one of a series of add on 3.5" drives from this company. They also sell a TwinDrive and TriDrive, which contain two and three 3.5" drives respectively in a single box. The Unidrive is a very low profile, small unit with a Fujitsu 3.5" drive mounted inside. MAST did not want just another 1010 clone, so they threw a few extras into this tiny box.

Most notable of these improvements is the box itself. Instead of a large plastic box, the Unidrive is a small heavy gauge metal box that will withstand everything from children's prying fingers to a charging elephant. Aside from the stronger case, MAST has added a drive disable switch to free up system resources for games like F-18 Inteceptor that needs all the Amiga's Chip Ram (the Amiga sets aside Chip RAM for each floppy connected to system). The disable switch is a toggle switch located on the back of the drive, so accidental disabling of the drive is unlikely.

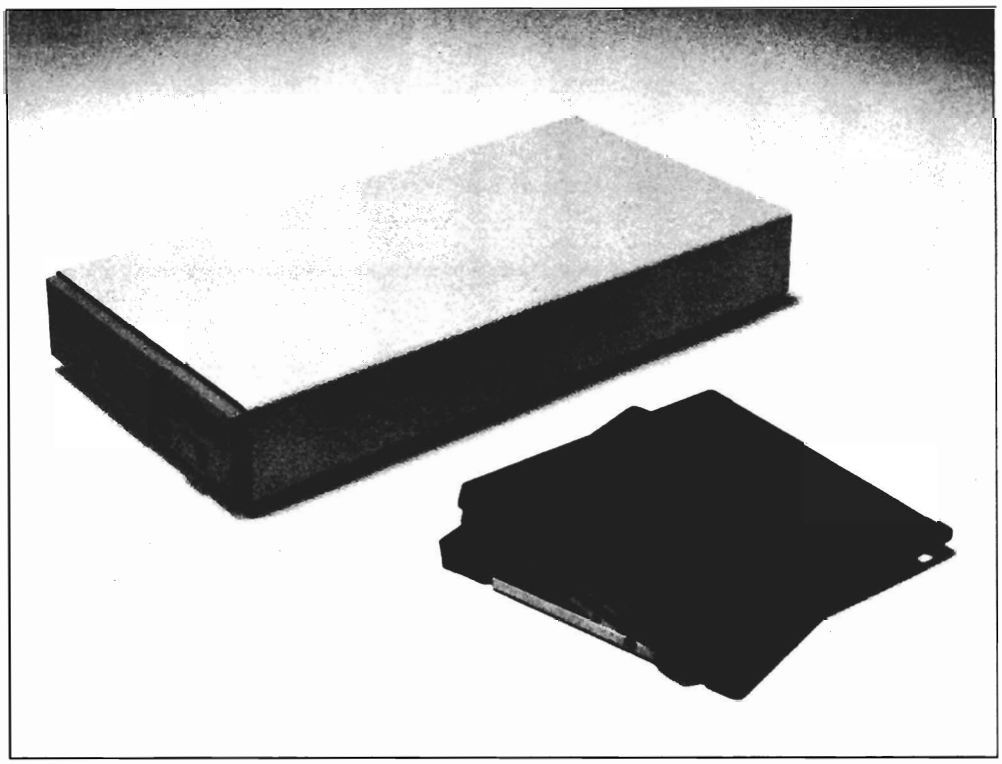
Next to the drive switch on the back of the unit is a small power jack. By purchasing an adaptor from MAST and changing a jumper inside the drive, you can power the Unidrive from the wall adaptor instead of the Amiga. This is an excellent alternative for Amiga 500 owners who worry about overloading the A500's power supply. Probably the most unusual improvement in the Unidrive is the hardware based drive click eliminator. Normally the Amiga polls the disk drive to see if a disk is in the drive.

One of the quirks in the 1010 design is that the head steps from position 0 to 1 and back each time an empty drive is polled. The head step is not really necessary for the proper function of the drive, so MAST has added the option of disabling the click by a jumper inside the drive. For Amiga 1000 owners, there is a public domain patch to Kickstart that does the same thing by software. Neither the software nor the hardware solutions cause any problems in normal drive function.

What I found the most intriguing about the Unidrive is not the drive, but rather the people and policies backing it. MAST is very interested in supporting their users, and has created an unusual policy of upgrading from a UniDrive to a Twindrive for the difference in cost. This gives the user a unique and comparitively inexpensive way to add a second external drive to the Amiga at an amazingly low cost. While this is commendable as far as customer support goes, it seems to me like a nightmare from the business and administrative end at MAST. I am concerned that in order for them to remain profitable, MAST will have to recondition and redistribute some of the equipment, or at least reuse your own Unidrive in the Twindrive chassis. We will have to wait and watch for the results of this policy.

If you want to daisy chain additional drives, you have to go back to MAST for an adaptor

kit, since the Unidrive does not pass through the disk drive connector. It would have been nice to see one of these adaptors since it may limit some of the choices of additional drives. The Amiga uses a 23 pin connector while the Unidrive uses a 25 pin plug. If the adaptor also uses the less expensive 25 pin plug, then only other MAST Unidrives can be added. The Unidrive comes with a 23 pin to 25 pin adaptor cable.



The UniDrive is one of the most compact 3 1/2" drives available for the Amiga

I can think of a few improvements that could be made in the drive. While the case is sturdy and nicely finished, it did not fit snugly against the drive, leaving a gap on the right side. Cosmetically, it is not bad, but it does defeat the purpose of the dust door on the front of the drive. I also had a small gripe with the little stick-on rubber feet on the bottom of the drive. Two of the four came off resulting in some scratches on my desk before I noticed that they were missing. The internal workings of the Unidrive could use some improvement as well. The circuit board on the back of the board looks a little sloppy, but functional.

Another area that could use improvement is the need to remove the cover of the drive to switch to external power or use the click disable function. I would prefer they use DIP switches located on the back of the drive. These are inexpensive common parts and remove the need for the end user to try to disassemble the drive or change around jumpers. Better still, would be the use of a power plug that automatically switches to external power when the adaptor is plugged in.

What it all comes down to is how well the drive works and that is what I made it do. I tried copying files to and from the MAST drive, loaded copy protected programs, and all functioned as expected. The drive is quieter than a 1010, and does not produce as many of the terrible sounds that the 1010 does while stepping the head. I am pleased with this drive and use it over the Amiga 1010 drive whenever possible. It does just what it should and a few things more without any unpleasant surprises. In spite of the possible problems in the upgrade policy, it is a commendable effort, and should be encouraged by the Amiga community at large. MAST has several other projects in the works that they were discussing at the recent AmiExpo. Based on preliminary discussions, projects such as their forthcoming "Kickbooter" could become big sellers.

UniDrive $ 169.00

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The Terminator

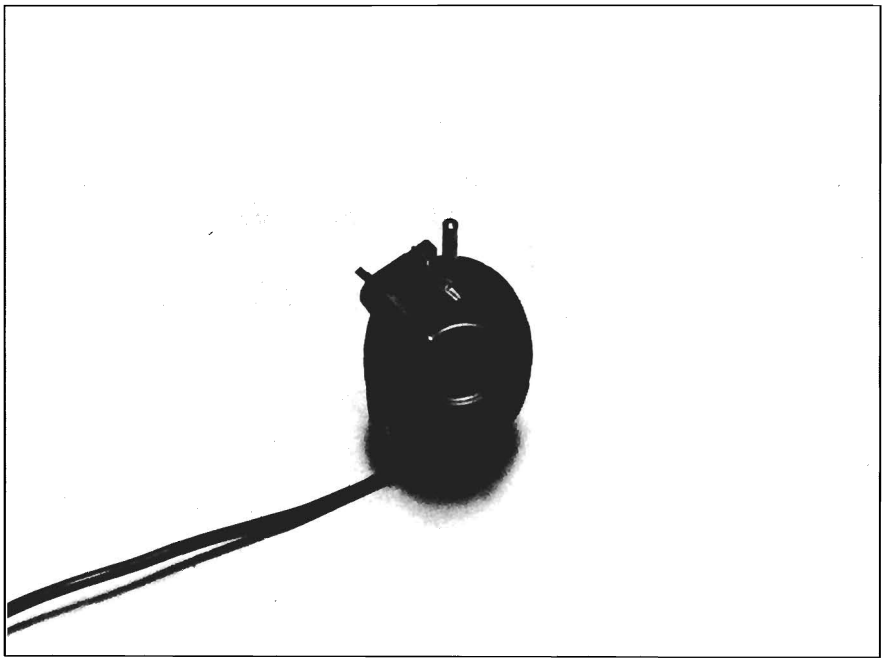
A most unusual joystick

by Anthony Bevivino

Hey, is that a grenade on your desk!!" That is not something a normal person would expect to hear often, but that cry becomes quite common when *The Terminator* is plugged into your Amiga. The Terminator is a joystick made to look like a grenade. While the Terminator does a very good job of looking like a grenade, it does not really act like a joystick.

The Terminator is made of a high-impact plastic, with a metal "spoon" and pin. The plastic is textured to attempt to give a good grip, but it is actually difficult to hold. The overall size of the joystick can be annoying as well. If your hand is too small, it is very hard to hold the joystick, so don't get it for your children. If you have large hands, the Terminator disappears in your grip, and the controls are hard to get at. I found the joystick to be very uncomfortable. It did not give me a firm grip, and it makes for seaty palms. The base of this joystick pivots, and allows the cord to either hang free for hand-held use, or be held on the side for table-top use. This table-top option can be pretty null as the joystick is too small to be placed on a table without supporting it with the other hand. The cord *is* very long and attached firmly to the joystick, so that's something in its favor.

Looking like an instrument of war,
The Terminator has a seemingly serious view on gameplay



One of the first questions asked about a joystick is "how does it move?" In this case, there is a great potential, but it is never realized. The steering "pin" on the Terminator is dosen't make sense. All movement is done using an inch-and-a-half metal stick about the width of a drinking straw. It is so tiny, you are forced to move it with just the thumb and index finger, no hand-grip is possible. After a few minutes, my fingers were sore from the metal rubbing against them and the awkward hand positions. Yet even with all that, the movement was fairly good. The quality of micro-switches used must be top of the line. The moves that I did make

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The Terminator

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were crisp, fast and accurate. It is a shame that I could not make these great moves for more than five minutes, when my hand became uncomfortable.

Coupled with this tiny steering pin is, naturally, a huge firing button. The "spoon" of the grenade is used for firing. It is about half an inch wide and runs almost the entire lenght of the joystick. Needless to say, you can't miss it. Combined with this firing mechanism is another excellent micro-switch. I was again suprised at how well the joystick responded to my slightest touch. Response was excellent, but wasted on the poor design of this joystick.

There is not much more to be said about this controller. It does a great job of looking like a grenade, but comes up short when it tries to perform like a joystick. The controls responded quickly and accurately, but the poor overall design of the joystick made it impractical to use. I could not recommend purchasing this joystick, except by reason of a novelty piece.

The Terminator

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By popular request, we have been asked to print a list providing telephone numbers for several of the vendors mentioned in our September coverage of Ami-Expo. .

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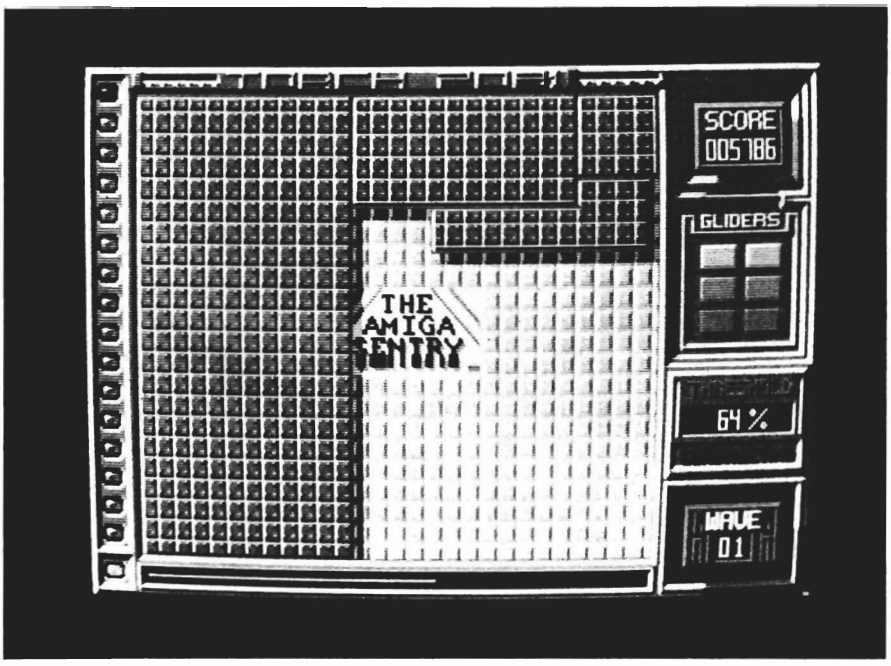
Torch 2081

Fast Paced Entertainment Software from Digital Concepts

by Steve Ushioda



As you strategically guide your futuristic "glider" to complete a large section of barrier, the deadly fireball suddenly changes course, heading directly toward you! This just one of the many tricky situations possible in Torch 2081, a new game from Digital Concepts.

The game boots from the Workbench prompt, and, after a lengthy load, the Digital Concepts and Torch 2081 logo appear. Next comes the introductory sequence, which shows the creation of all the main objects in the game. These include your ship, a fireball, and two perimeter patrollers. Finally, after choosing the level of difficulty, you're ready to play the game.

This game is completely joystick operated, and only the four main directions can be used. The view is from the top of you and your adversaries.

It is not hard to learn the basics of Torch 2081, although it is difficult to explain them. The object is simply to "block off" a certain percentage of the screen, while not being killed. Normally, you can only move around the borders of the screen, but with the trigger held down, you can venture out into the playing area, trailing an intense line of energy.

When the energy beam closes off an area completely, the game pauses for a moment while filling in the area with a pattern. After you've enclosed enough space to break the "threshold" percent, you move on to the next level, which is just slightly more difficult.

The main object keeping you from this goal is the fireball. It is always found bouncing unpredictably off the "walls" of the screen. You are safe from its destruction only when you are on a boarder, but if it hits one of your unfilled energy lines, you lose a glider. There are also two other enemies to impede your

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Better Dead than Alien

Arcade-Style shoot-em up from Discovery Software

by Anthony Bevivino

After four long years in space, the intrepid explorer BRAD ZOOM landed on the planet Mars, Earthdate: April 1st 1954. He set forth to explore this new world, BUT at that moment, the air was full of the mechanical grind of an alien taskforce. BRAD ZOOM, adventurer from earth, was under attack from creepy crawlies from another planet: Martians? Moonmen? Asteroid-Folk or something much worse?!?! A cry of "Earthman! Prepare to be shot!" came from above, and BRAD ZOOM turned to find thousands of creepies cascading from the sky towards him.

Better Dead Than Alien is a "shoot 'em up" space game in which you, as BRAD ZOOM, pilot your ship to fight off wave after wave of hostile aliens. In principle, the above sentence summarizes the entire game. There is no "grand design" or "ultimate goal" in Better Dead Than Alien. Instead, survival is your only objective. While this may seem like a re-make of countless other space games (as I first thought) a closer look at Better Dead Than Alien gave me quite a few suprises.

As with all arcade-style games, graphics are of utmost importance. I would be lying if I said this program had excellent graphics. It most certainly does not. What it does have is a "different" type of graphics. The look of the aliens, the background, and your ship, are all unique in some way. The aliens come in many different varieties. I have yet to find a wave where the aliens look similiar or have similiar attack patterns. The backgrounds you fight in are soothing to the eye and yet still attract your attention. Long periods of game-play did not result in eye strain, let alone a headache. The color-scheme used was well thought out and gave maximum effect without excess color.The one graphic I found most appealing was the ship I piloted. It was not your typical spacefighter. It resembled a glowing geometric figure more than anything. I felt this was a breath of fresh air in a game that could have been filled with over-used graphics, rather than these exciting new ideas.

The second major component of this type of game is sound. I was delighted at the superior quality and originality of sound in Better Dead Than Alien. Most games use sound in a "supporting role" for the graphic action, but in this case, the sound is in a class all by itself. All sound used in this game was well-placed and well-used. There is not a great quantity of sound, but there is great quality present. The programmed sound, the shots, explosions, etc. are at just the right volume and with enough variety that the sound does not become a meaningless drone in the background. I was very happy with the digitized sound in Better Dead Than Alien. There are only a few digitized sounds used, but they are truly fun to listen to. Your ship goes "Ouch!" when hit and when you get a high score, a round of applause sounds in the background.

There are a variety of different screens that you will encounter as you play the game. There are, of course, the alien waves. At

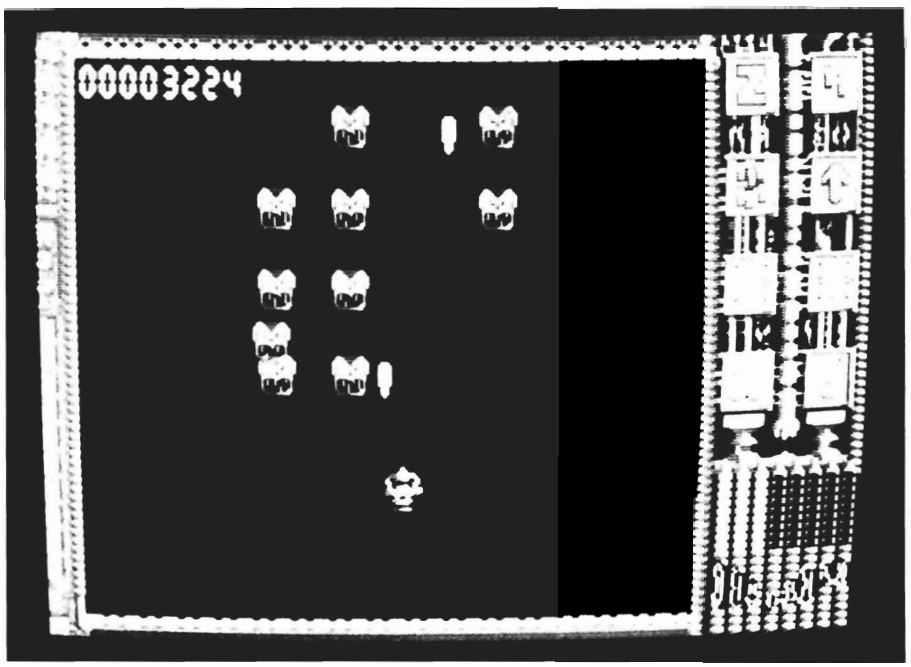
the beginning of each wave, the aliens appear in a set formation and move around the screen. Aliens will soon begin to break off from the formation and fly down to fight you. Each alien wave has its own flight pattern and shot type. After two or three alien waves, you must fight your way through a meteor storm. Meteors fly randomly around the screen and you must destroy them before they run into your ship. They break into smaller, faster moving pieces as you shoot them and soon the screen is filled with fragments. Maneuverability as well as firepower is needed here. At the end of each wave, there is a "Master Alien" that you must contend with. The Master is huge, and must be shot many, many times before he is destroyed(or decides to leave).

One small touch I appreciated is the "in-between" screens. When you move through the waves, a picture of BRAD ZOOM will appear in the background. It is a black and white drawing that is really a shadowy backdrop to information on the screen, but the pictures are well done, and I thought it was a refreshing break and made game pauses very bearable. On the right hand side of the screen is a "Destructivity Intensifier" meter. There are eight special powers available, as well as an energy meter. Some of the powers include "Armour Missile," which goes through an entire rank of aliens, "Clone", which doubles your ship and fire power, and "Neutron Bomb", which weakens all aliens in the wave. It is not easy to get these powers, however. Sometime during the wave, an aliens eyes will begin to glow green, and one of the icons on the Destructivity Intensifier will light up. You must shoot the alien and catch the power capsule to get the power. It is possible to shoot the capsule as it falls towards you, so be careful! Once you get a power, it lasts for that wave only, unless you manage to shoot the last alien when it glows and catch the power capsule. The special powers are very important, and it is near immpossible to get through some waves without them.

The movement and firing in "Better Dead Than Alien" were definitely a cut or two above the pack. The game can be played using either mouse, joystick, or keyboard. While each of these options worked well, I would have to recommend using a joystick. The movement of your ship is crisp and responsive; I had no trouble making my ship go through some space-acrobatics to avoid alien shots. When you first move, you must initially overcome inertia, but this is not overdone. The small delays in movement due to inertia add some realism to the game, and make it much more challenging. Another feature that I liked was the firing. In an arcade-action game like Better Dead Than Alien, firing at the enemy is your most common act, but in many games, it recieves little attention. In this game, your shots are destructive-looking and fast, not just little lines that zoom up the screen to devastate an enemy. This seemingly small detail

(continued on page 62)

In BDTA, you fight off wave after wave of menacing mutants



Sex VixenS

FROM SPACE

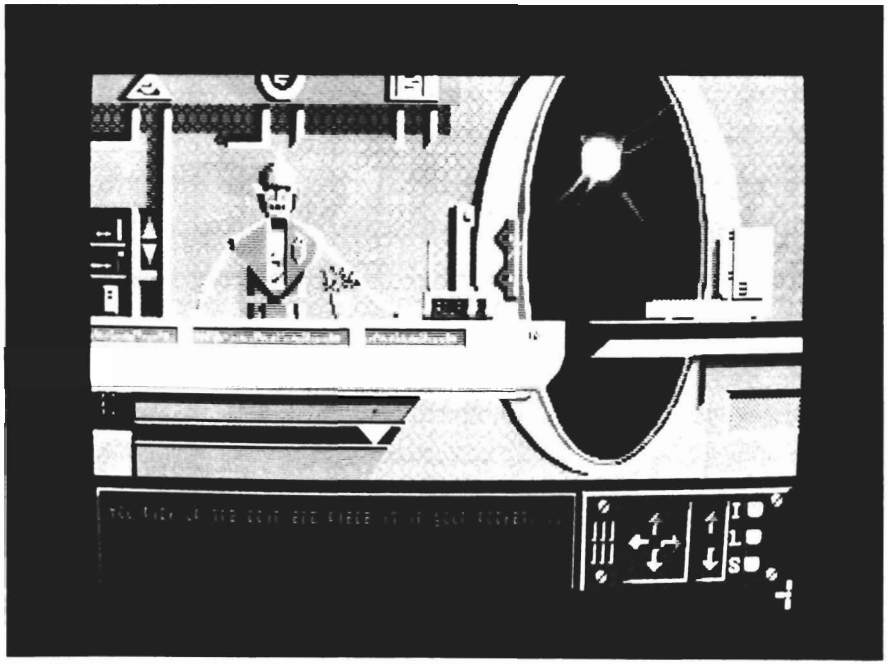
Adult adventure in the tribes of "Mondo"

by Eric Hunt

Hello again," to all adult adventure game fans. This time we find ourselves in outer space with an impossible mission: to save all the known galaxy from the female "Tribe of Mondo". These dangerous creatures look like ordinary women, but are actually sex-starved female clones in possession of a deadly sex-ray gun designed to drain the life out of its victim. This group is responsible for the ruin of many a space colony. You are Captain Brad Stallion, owner and operator of a one-man space freighter named the "Big Thruster". As the game begins, you wait onboard for notice of your first assignment from the Federated Government.

Suddenly, an urgent message is received by SANDIE (Ships Automated Navigation Data and Information Entity). "You may want to sit down for this ...You are ordered to Federated Planet One. A maid at the Pink Flamingo (named Lila) is suspected of a connection with the TRIBE (of Mondo). Find out what she knows. Use any means necessary. The course has been fed into your Navigational Computer. Good luck Brad." You sit in the Captain's chair facing an impressive array of instruments, and blast off following the preset course. From this moment on, you must remain completely alert. You will need all your wits and more if you are to survive this first assignment (and you can bet future assignments will be far worse).

A picture of just about the only character in Sex Vixens not looking for some action



Time just seems to whiz by as you engage SANDIE in pleasant conversation, while reflecting on the little you have been able to learn about the female named Lila. Upon arrival, you may want to explore your ship. Perhaps you will find some items useful towards fulfillment of this mission. Some forgotten cargo looks promising (but for what). Very soon, you are jetting over the treacherous terrain of Federated Planet One. The grav-car provided by the Pink Flamingo hotel executes its pre-defined course flawlessly. You seem

just a little nervous as you arrive at the unfamiliar hotel docking gate. Odd, Brad is well known as the adventurous type. Don't tell me your afraid of hotel droids. Oh, not really afraid eh ... just feeling a bit out of sorts. Well, come on now, check in and check out your room. You'll find it equipped with an extremely comfortable bed, computer console, and an instant woman machine. What else could you ask for? Now Brad, keep your mind on the mission! You explore your room and await the arrival of Lila. She is everything you hoped she would be. A sensual vixen in her own right, Lila could easily lull you into an extended detainment. But, you have your mission to consider. You would be safer to check in with SANDIE. "Brad ... Brad You suddenly realize that you are in over your head, and your passions are replaced by a single minded need to end the senseless slaughter of comrades throughout the known universe. Your focus returns to the question at hand.

"Hiii Braaad. This is SANDIE. We have arrived on Space Station X." You gather your thoughts as you prepare to meet the head of a rich, powerful, and corrupt syndicate. Is there anything that you've overlooked? If so, it's certainly too late now.

Distraction is a girl named "LILA"

You're in the Control Room of Space Station X. Standing near the control panel is the Station Commander. He is the grizzled veteran of many wars and looks like the type you would expect to have illegal dealings with outlaw groups. Time to talk to SANDIE. She can always be counted on for sound advice at a moment like this. SANDIE responds with "Hiii Braaad. This guy has been here a LONG time. You don't have to be a brain surgeon to figure out what is on his mind."

And so it goes...

"Sex Vixens From Space" is a fun and stimulating adult fantasy adventure. The authors have a zany kind of humor, which shows itself in almost every scene. Each scene is a puzzle, and the early stages of Sex Vixens have only one correct solution. You will be guided to the correct action, but only after many unpleasant deaths. Death comes quickly in this game, but so does pleasure.

Unlike some other adult fantasy games, Sex Vixens delivers. When you meet a member of the Tribe of Mondo, you'll almost inevitably end up in a compromising position (you can tell Tribe members by the letters LA in their name). The graphics in the game are not digitized, but have been drawn with talent and appreciation for the variety of the female form. Dana Dominiak, who's other credits include work on "Capone," supplies the artistic talent behind Sex-Vixens.

I appreciated the scrolling feature, that takes you from scene to scene as well. This is smoothly accomplished while you are planning the next move. Too many graphic adventures require long pauses filled with distracting disk access noises. I very much appreciate the smooth and quick responsiveness of this game. The adult theme is the other positive aspect of Sex-Vixens as an ad-

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Torch 2081 *(continued from page 57)*

progress. These are the perimeter patrollers. They can move around the borders of the screen (or sections that you've created) just like you, but are unable to follow you up an unfilled energy line. Contact with a patroller will cost you a glider.

One additional hazard is a small fireball, or spitfire. These little adversaries are released one at a time from the larger fireball, and will destroy your glider if touched. Points are awarded in a complicated manner based on how much of the screen you fill, and how much fuel and time you have left after completing a screen.

The packaging for the game is fine, but the instructions are very hard to understand. Aside from the standard directions, there is a short paragraph in the beginning of the documentation explaining the object of the game. Most of the information has nothing to do with actual gameplay.

Torch 2081 is well suited to the Amiga. It has decent graphics and nice sound effects. It is one of those games that takes a very short time to learn, but a potentially long time to become really good at. The strategy required to master the game is somewhat unusual, and this element contributes to the entertainment value of the product.

However, the game does have some imposing limitations. The biggest one is that it is too repetitive. Once you've seen one level, you've basically seen them all, and there is not much excitement added to the game at higher levels. Although I mentioned that Torch 2081 has some unusual aspects as a game, the game is very similiar to an old arcade game called "Qix."

Finally, I wish the overall complexity of the game was higher. Once oriented, you can achieve very high scores in a very short time. With a game based on a challenge of reaction time and skill, it is important that the challenge not be too easily overcome (that's why they put all those quarters in the arcade machines, isn't it?).

Although Torch 2081 offers a change of pace from the sometimes too familiar shoot 'em up game plot, it is apparent that it was designed to reflect the relatively low price tag of the game. The problem is, where the avid Amiga gamester is concerned, they're looking for "more awesome," not *less expensive.*

TORCH 2081 $24.95

Digital Concepts
28800 Gratiot Ave., Suite 162
Rosevilee, MI 48066

(313) 772-1416

BDTA

(continued from page 59)

was very much appreciated. Whenever the two player option is used, both players go at the same time, rather than separately. I really enjoyed the game when another player piloted a ship and we both worked together on the same screen.

Another feature I liked was the "code word" option. Whenever you enter a new level, you are given a "secret code" for that specific level. Whenever you begin a game, you can enter a "code word" for any level you have been on, and you start at that level. This is a very effective compromise between being able to choose any level to start and the drudgery of always starting at level one.

Perhaps the highest compliment I can pay to Better Dead Than Alien is to say that it is just plain fun. At first, I was turned off by what appeared to be a re-hash of every "space-shoot 'em up" made for the Amiga. I was quite pleased to be proven dead wrong. The small changes and attention to detail made this game more pleasurable to play. I would recommend Better Dead Than Alien to anyone interested in a simple, fun game that, barring any boot-up problems, can provide a medium level of challenge.

Better Dead than Alien $34.95

Discovery Software
163 Conduit Street
Annapolis, MD 21401
(301) 268-9877

Sex Vixens *(continued from page 61)*

venture game. Most adventures are based on fantasies that could even bore a child. Collecting treasures and killing monsters is too real, too much like every day (especially if you work in an office environment). Collecting female companions along the way is a different story.

"Sex Vixens From Space" is a game for all adult gamers. It is however, a game designed to appeal to men first. But please ladies, don't be put off. There is much in the humer and antics of the game which will appeal to the fairer sex as well.

Of course, there are some things I would like to change about Sex Vixens. First it desperately needs a save feature. It takes precious time to retrace your steps back to a dangerous situation. How could a modern day software developer overlook such a fundamental tool as the save feature? Also animation would be an exceptional finishing touch. I can live without it, but many younger people are bored without the constant movement and interaction of graphic figures and scenes. The most glaring lack in Sex Vixens is sound. The game is silent as a tomb. There is no background music and no sound effects. I played the game for an hour and checked and rechecked my stereo. We all know that music is a vital part of creating a mood and the "action" scenes cry for appropriate sound effects.

(Free Spirit software promises to remedy two of these complaints in the sequel. Bride of the Robot will feature digitized sound effects and a save feature. Our hero Brad, will also star in this one).

As a consumer, I feel this game is fun. It is not as clever as "Leisure Suit Larry," nor as intellectually stimulating as "Romantic Encounters at the Dome," but it has plenty of appeal. This is another good adult adventure/fantasy game which will give you hours of enjoyment -and you won't need a hint book to get in on the action.

Sex Vixens from Space
$39.95

Free Spirit Software, Inc.
58 Noble Street
Kutztown, Pa. 19530
(800) 683-5609

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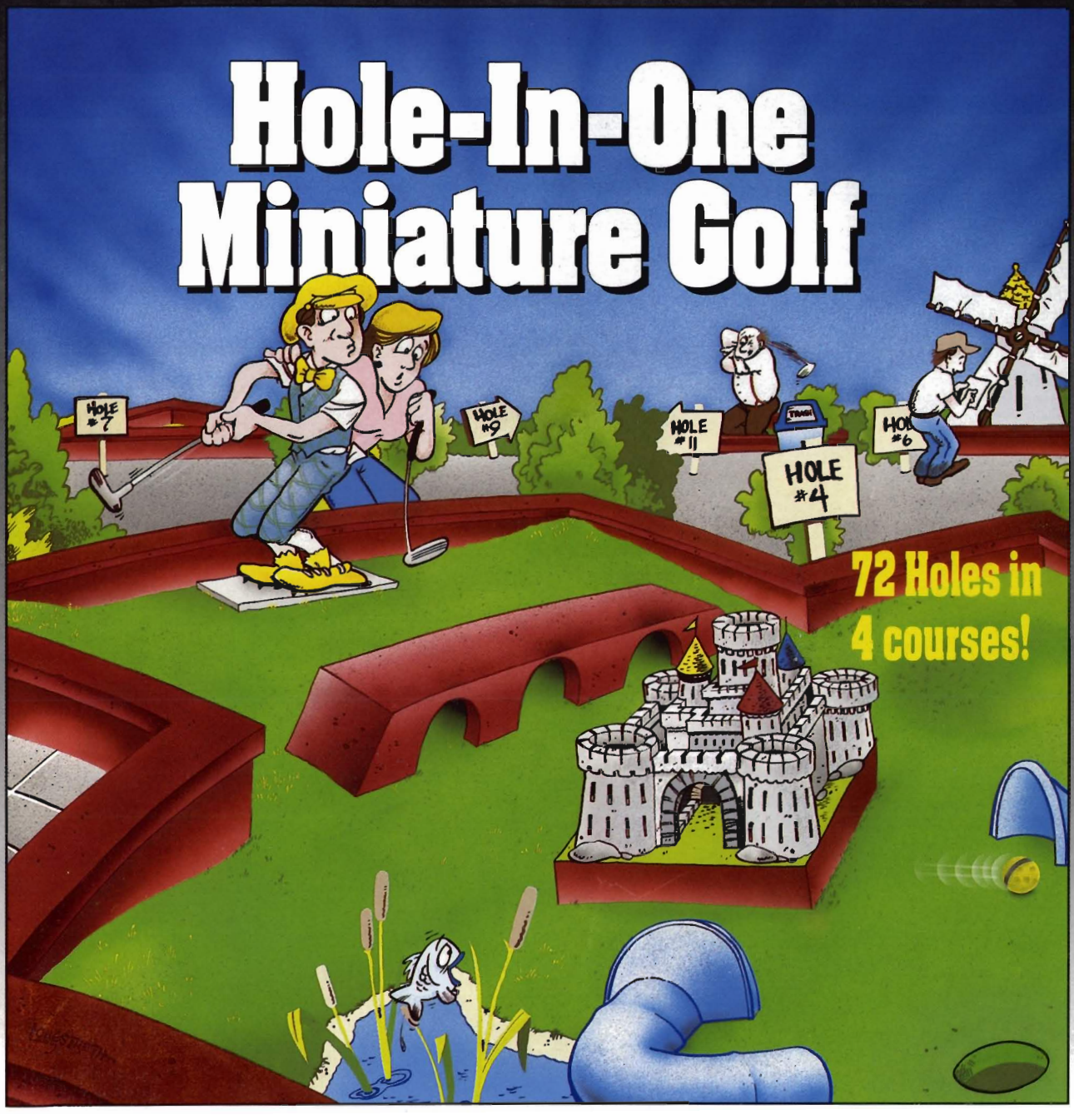
Hole-In-One Miniature Golf



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