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AMIGA WORLD

January 1991
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A Graphic Demonstration

Deluxe Paint III
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Digi-Paint 3
gives you 4096 colors and costs $99.95.

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Which one of the artistic tools pictured here would a child choose? The answer is obvious, the more colors the better. The choice is just as easy when it comes to Amiga paint programs. Digi-Paint 3 works in the Amiga's powerful Hold-And-Modify (HAM) mode which allows you to paint using all 4096 colors simultaneously. By comparison, Deluxe Paint III (by Electronic Arts) operates in less sophisticated modes, restricting you to a maximum of only 32 colors*. What does this mean to your Amiga art? Simply put, the program with more colors makes the better pictures. But that's just one of the reasons Digi-Paint 3 is the ultimate paint program.

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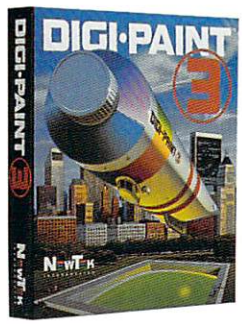

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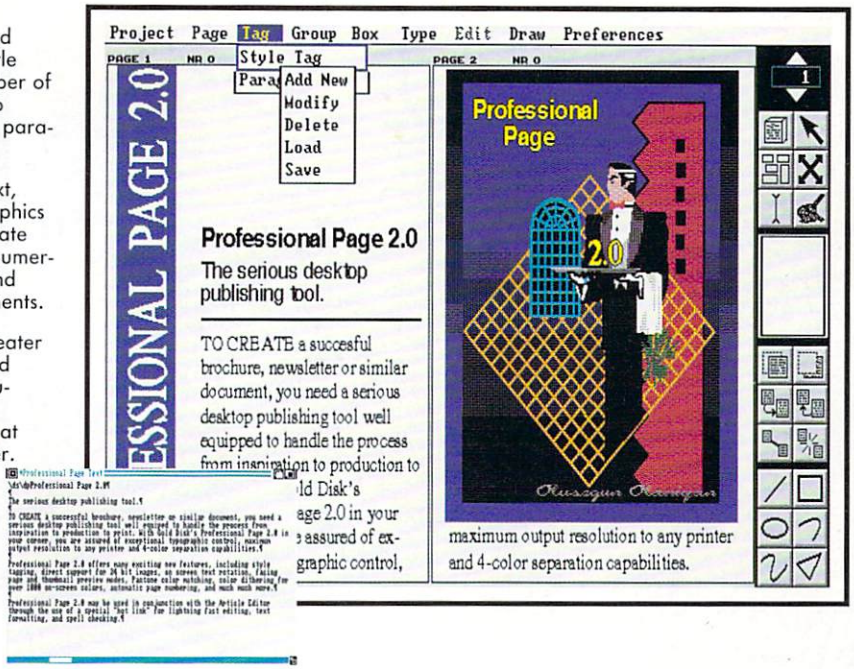

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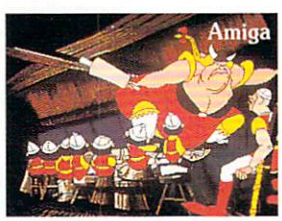

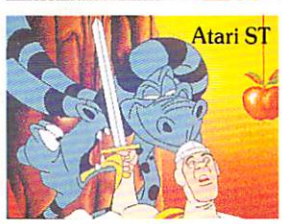

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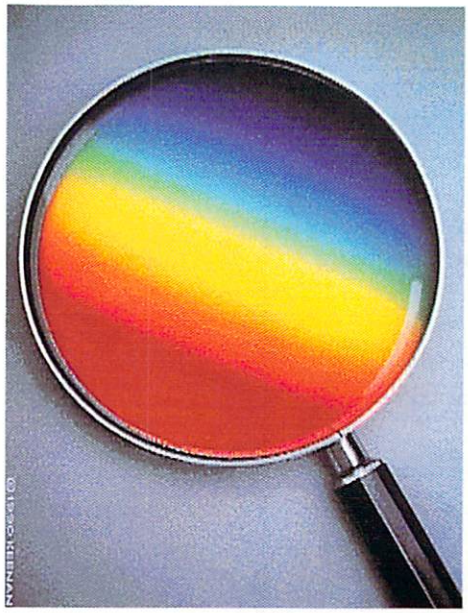

"A Case in Paint"—p. 26
As the magnifying glass suggests, the focus this month is on Amiga 2-D graphics. We've scrutinized the subject from every angle and presented the evidence in a 30-page special "Features" section. We hope you'll bring in a favorable verdict.

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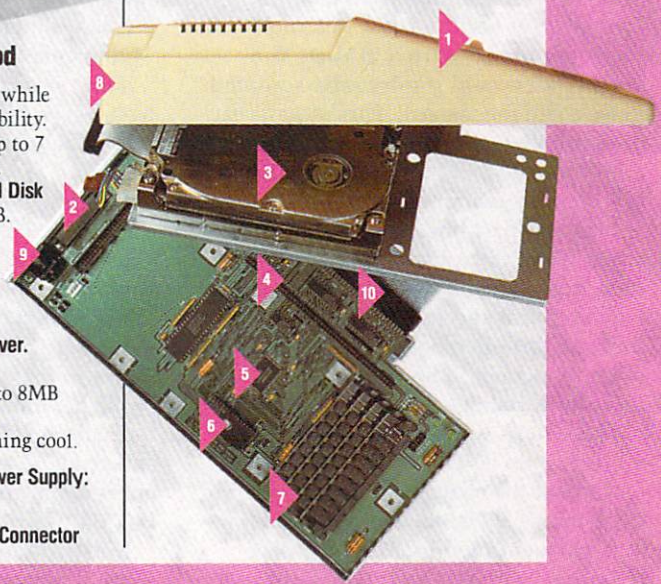

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***AmigaWorld* has changed; so what else do you want?** In July of 1989 I went to Ami-Expo in Chicago. It was my first Amiga show ever. In fact, I hadn't even formally joined *AmigaWorld* at the time.

During the job-interview process, however, I not only wrote up a resume but developed a plan to change *AmigaWorld* as well. I'm not sure how, but I was offered the job, so it was off to Chicago, a city even windier than these editorials.

Some of you may remember being corralled and badgered as I sought to discover whether our proposed changes would indeed be positive. About 50 people were cornered and peppered with the same set of questions.

AmigaWorld has always hit a nerve with readers, so there was plenty of feedback about the current mag and what people wanted changed. Some said nice things, and some said nasty things. At least the new ideas seemed decent to people.

After I got back to rustic Peterborough, my phone started to ring. Vendors, readers, and sundry others wanted to welcome me aboard. This was a great opportunity to ask the very same set of questions. Most of these folks also agreed that changes made sense.

That was part one. Then this now larger list of ideas had to get past my staff. Being journalists, they were naturally skeptical and full of questions, but through this often boisterous process came refinement, plus a slew of brilliant ideas from staffers. That was step two.

These steps were the easy part. Then we had to do it. This was actual work.

Many of the changes first appeared in the January '90 issue, and more followed in subsequent months. We purposely chose not to make a stink about the changes, and piles of letters later it is clear that they have gone over pretty well. We still have plenty of critics, but now a larger percentage consists of our competitors.

Here's a quick synopsis before we resume the usual Chief Concerns diatribe:

The editorial was designed to serve as a staunch (read obnoxious) advocate of Amiga technology. Many were taken aback (read insulted, offended) by the initial strong tone of the editorials. But since then, the response has been overwhelmingly positive.

Reviews now include shaded boxes containing your comments about the product, and in most months we add a reader-response section to the reviews, where vendors and users can praise, disparage, or correct our reviews.

We have instituted a more aggressive system of fact-checking. Although we are still refining it, many would-be errors have been corrected.

We developed a column on programming (Pointers), and another on multimedia techniques (Mastering Multimedia).

The focus of Game Preserve, aside from reviews, has shifted from a discussion of game themes to a tip-oriented column.

One of our more problematical departments, Last Licks, was originally developed to include a monthly cartoon, a rumors section, and a humor piece. But nobody laughed at our humor, and there were mixed reviews of the cartoons, so the cartoons and humor get the heave-ho, the rumors (Ear to the Wall) stay, and opinion pieces by *AW* editors and readers, or Amiga users and developers debut with this issue (see Soap Box on page 136).

Notepad never seemed to hit its stride, so we dumped it for a news section (Headliners). Then we added PD coverage (PD Prospector) to help people learn about cheap and free software.

Finally, we decided to go after exclusive coverage of important new products like the A3000, CDTV, and the Disney Animation Studio.

When I go to Amiga shows, I still look for feedback from readers. And they give it! "You did this wrong. You screwed that up again. And by the way, thanks for the great magazine."

It seems that the majority of readers are taking to the new *AmigaWorld*. Unfortunately, some think it is all due to one person, the Editor-in-Chief. While I'd like to take all the credit (and have probably tried to), it must be shared.

One of the primary forces was you, the reader, who told us time and time again what you wanted to see in *AmigaWorld*. Through letters, phone calls, computer networks, and personal encounters, you continue to prod us to change. It isn't always fun to hear the criticism (okay, so some of us kind of like it), but it is always helpful.

Most important is the entire editorial staff of *AmigaWorld*, who shot down my worst ideas and helped develop better ones. That is where our Multimedia, Pointers, Headliners, and PC Prospector columns came from, and that is where the vast majority of feature articles originate. And the staff are the people who spared you more humor pieces in Last Licks.

So why am I wasting your time bragging about our magazine? It sounds trite, but it's true: you told us what to do. That is why it has worked. Even though we have made these changes, we are far from done. So call us (snoop in this issue for the toll-free number), write us, corral us at shows, and badger us for a while. Maybe we'll change! ■

Doug Barney

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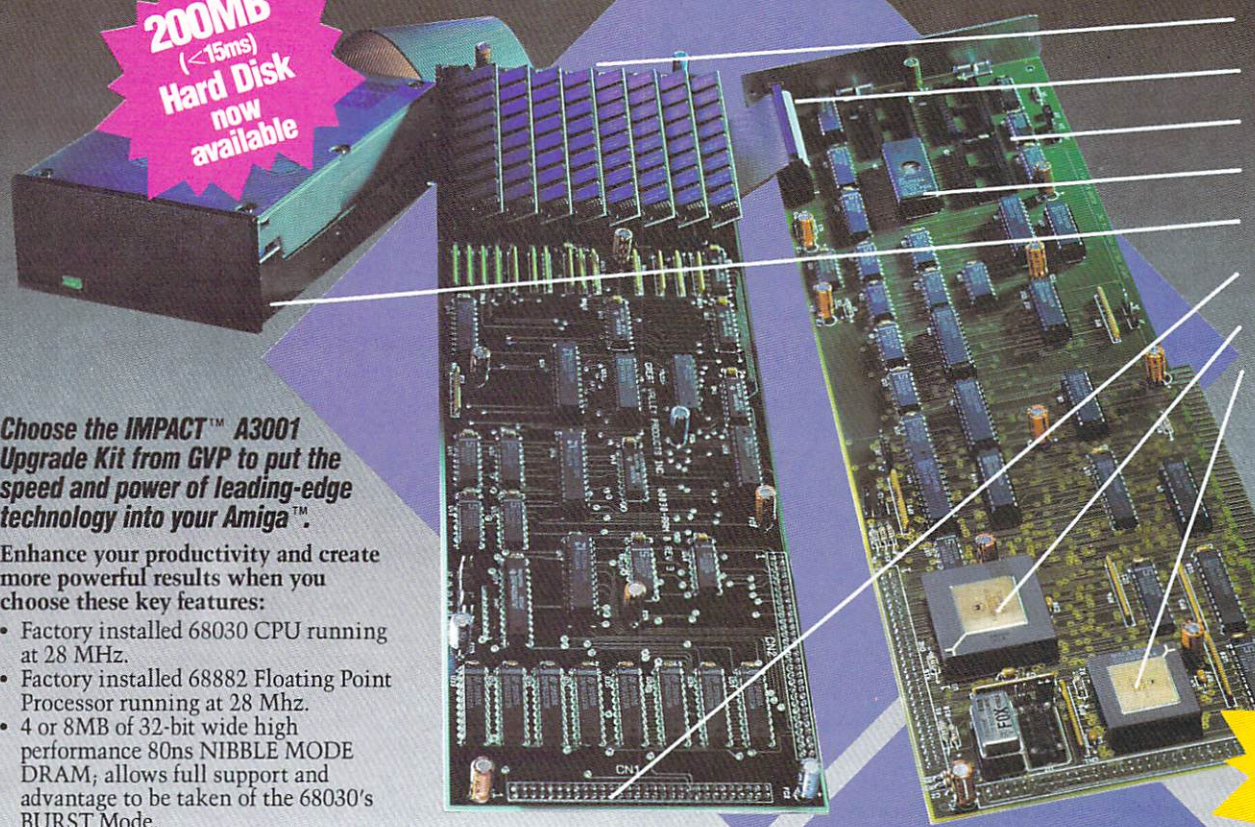

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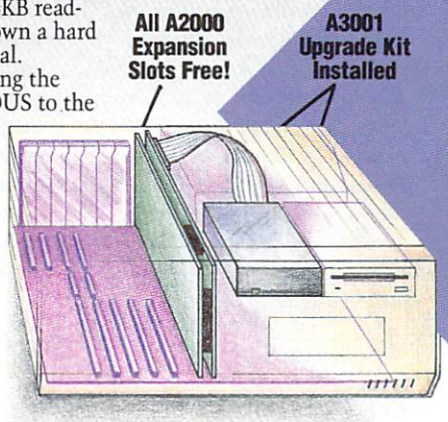
- Asynchronous design allowing the 68030 to run ASYNCRONOUS to the rest of the A2000 improving GENLOCK compatibility.
- ZERO SLOT SOLUTION! With the A3001 Configuration along with the bundled 40Q or 80Q Hard Disk Drive ALL A2000 EXPANSION SLOTS ARE LEFT FREE FOR FUTURE UNLIMITED EXPANSION!



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Number of *Open* Amiga expansion slots with hard disk drive and 8MB *Fast* memory installed.	5	3	4
Allows user to start with low-cost A2000 Amiga system and grow all the way to 50Mhz 68030 performance without sacrificing anything.	Y	N	N
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Fully implements 68030 Burst Mode up to 33Mhz.	Y	N	N

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REPARTEE

Comments, complaints, and concerns

from AmigaWorld *readers.*

SERVICE WITH A STAMP

The latest problem I have encountered with Commodore and the Amiga is the company's lack of mail-order support. I prefer to purchase Amiga hardware by mail because my local Amiga dealer gives me nothing for my extra dollars. The dealer's staff knows very little about the Amiga and offers no extras, such as a loaner system during repair sessions or a software trial period. For repairs, the dealer sends the Amigas to another location.

Does Commodore, with its policy of no mail-order sales, expect me to purchase my next Amiga at Sears or Toys-R-Us? If so, will their sales personnel be able to answer technical questions? Will they have repair centers at the store? I have no incentive to spend extra money when I will receive no more service. In fact, many mail-order operations now offer excellent service agreements, technical-help hotlines, and other benefits.

I cannot fathom why Commodore wants to pull the plug on mail-order business. If the rationale is to build a dealer network, then the company will fail for two reasons: CBM does not encourage dealers to learn about the Amiga, and it assumes that mail-order business undermines dealers. Consumers who do not feel comfortable purchasing computers via mail need knowledgeable dealers who are capable of helping them analyze their needs and who can demonstrate solutions. As a customer, I want the right to purchace computers from whomever I please—mail-order dealers or local retailers.

Gavin McMillan
Tampa, FL

BREAKING UP IS HARD TO DO

I just cannot believe *AmigaWorld* is going to split into two magazines. I understand all the excitement over the new Tech Journal, but *AmigaWorld*'s technical information is what prompted me to subscribe in the first place. Instead of introducing another magazine, just add on. Take a look at some of the larger publications such as PC World, BYTE, Computer Shoppers, PC Magazine, and many others that offer three to five hundred pages of features.

I follow BYTE Magazine's Amiga hardware coverage because they dig deeply, amply covering chips, techniques, and processes. Your hardware articles serve only to prompt me to start looking for the appropriate BYTE issue containing the information I need.

I would like to see *AmigaWorld* use a backhoe to dig into the machine more deeply and add to the current magazine. Don't break your magazine in half and fight for advertising. Why split apart into two humdrum magazines instead improving what you have?

Richard D. Harrold
Ferndale, California

AmigaWorld *is not "splitting up" into two magazines; we are adding a new one of a very different nature.* AmigaWorld *magazine will continue with the same coverage and emphases as before. With* The Tech Journal, *we are simply responding to the urgent requests of a specialized and heretofore largely neglected audience of programmers and technically minded Amiga users seeking advanced programming and other technical information on a scale and at a level that* AmigaWorld *has never had sufficient space to include.* The Tech Journal *will be accompanied by a disk of code relating to* The Journal's *tutorials and articles, as well as relevant public-domain programs.*

As for the advertising scramble, The Journal *will appeal mainly to vendors who do not advertise in* AmigaWorld, *and* AmigaWorld *cannot grow to include the new coverage because the ad pages aren't there to justify additional editorial. Users who don't want both will have to make a choice.*

—Editors

GET TOUGH

The Wall Street Journal recently ran an article entitled "Apple Peels Prices of Its New Models." The article described Apple's plan to release three new Macs: a low-end, a mid-range, and a high-end model at reportedly very low prices. New models will be simultaneously released in 121 countries and heralded by a three-month, $25-million advertising campaign called "Industrial Revolution."

I have no idea how these computers will compare to the Amiga in terms of price or performance, but I am once again frustrated by the limited marketing efforts of Commodore, and worried about the Amiga's survival.

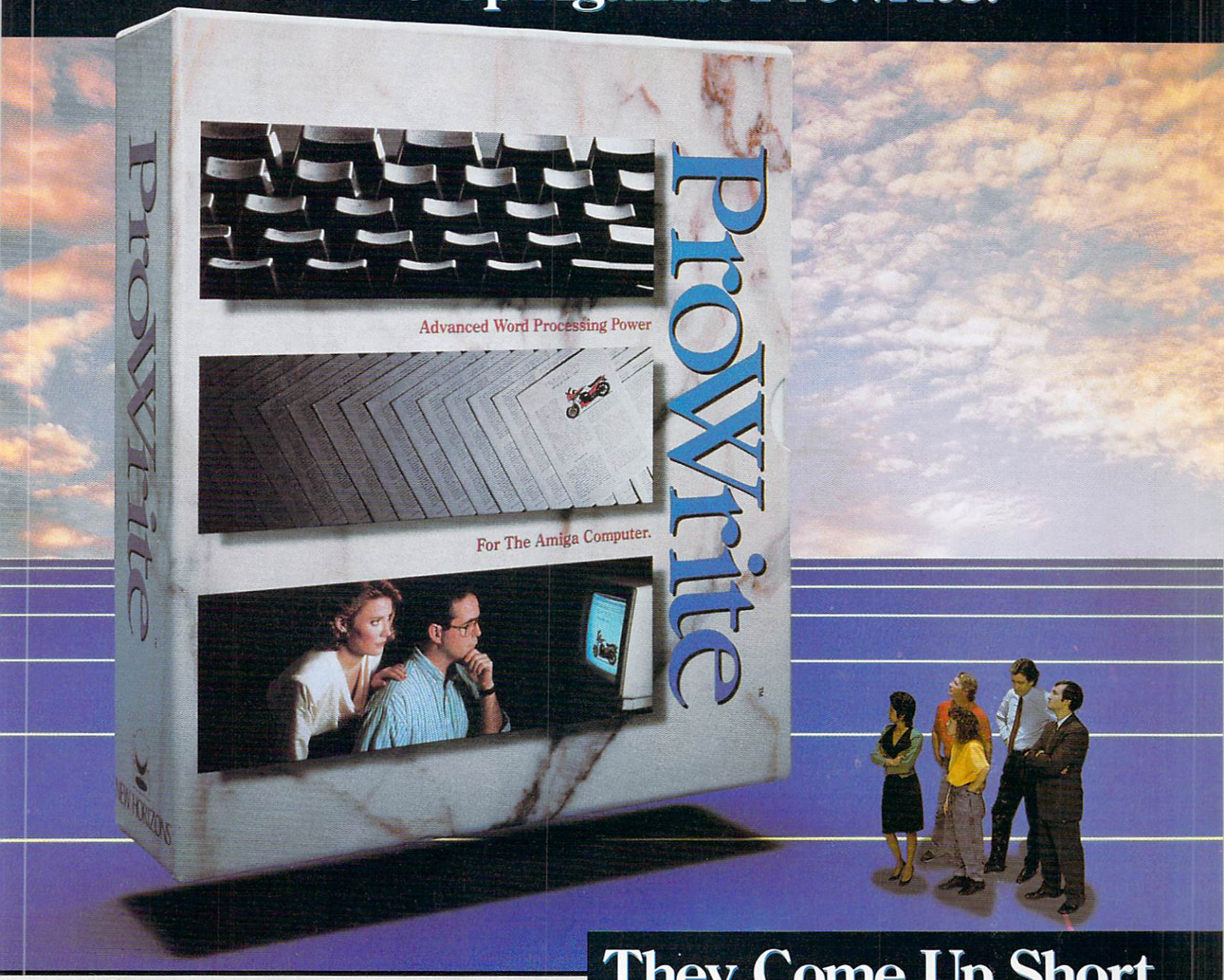
I've spent the last two months trying to convince the PC-ingrained company where I work to purchase an A3000. Our MIS crew is reluctant to break away from the Big Blue standard, and my solitary voice doesn't carry much weight.

My point is that word-of-mouth advertising is not enough in today's fiercely competitive global computer market. Commodore must undertake aggressive advertising outside Amiga-specific publications. We already know what a wonderful machine it is; tell the *rest* of the world!

Mark J. Sherbine
Ridgecrest, California

Send your letters to: Repartee, *AmigaWorld* Editorial, 80 Elm St., Peterborough, NH 03458. Letters may be edited for space and clarity. ■

How Does The Competition Measure Up Against ProWrite?



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Headliners

NEWS FROM THE AMIGA COMMUNITY

AmiEXPO California draws record crowd of 12,418, making it the largest Amiga show ever held.

So Long, Mickey Mouse

ANAHEIM, CA—Incongruously ensconced in the child's paradise of Disneyland Hotel, AmiEXPO California (held October 5–7) was a pro's show all the way. Gone was the t-shirted, slapped-together feel of earlier shows; this was replaced by professional-looking booths, presentations, and, most importantly, products.

Progressive Peripherals & Software demonstrated its readiness to help you do more work faster with **040-DC**, its 68040 accelerator. While slightly jury-rigged with a special cooling tower, the board *was* running and was the only one of its kind on the show floor.

The company's 10-meg **VideoMaster 32** (a 32-bit, TI34020-based dual-frame buffer promising 24-bit painting and digitizing capabilities) had much stiffer competition. Five such boards tried to out-demo each other: Besides VideoMaster, there were Impulse's **Firecracker 24**, M.A.S.T.'s **Colorburst**, Digital Creations' **DCTV** (this time accompanied by its 24-bit paint and animation software), and Black Belt System's **HAM-E**. (Meet you at the same time next year to see who wins the 24-bit wars!)

To further improve your display, ICD showed **Flicker Free Video**, an impressively small card that stills interlace flicker on all Amiga models with standard or multisync monitors.

Need to key those graphics over video? Progressive and VidTech have one solution each: The former introduced its new **Video Blender** board and **MixMaster** software, while the latter paraded its S-VHS-compatible **VideoMaster** card. Both promise some special-effects capabilities. A newcomer to the video circuit, Spirit Technology, provided a third choice with its **remote-controllable genlock/encoder**.

While usually not as flashy as the video boards, the **hard-drive controllers** put on quite a show. The ability to play full-screen digitized video from disk in real time seemed to be the one audition requirement, and the GVP, ICD, and IVS boards all made the cut. For sheer capacity, GVP took top honors with its **600MB optical drive** and **50MB removable-media drive**, both based on Ricoh technology.

As with hardware, the software on hand was heavily graphics oriented. Two new paint and animation programs were unveiled: the 64-color **Graphics Workshop** (HoloSoft Technologies) and the HAM-mode **SpectraColor** (Oxxi). While showing **Foundation** (a revamped UltraCard) at one end of its booth, Impulse sold copies of its 3-D modeler, **Imagine**, at the other. Also for the 3-D crowd, Progressive introduced **3D Professional's ray-tracing module**.

Those in need of object-oriented software were drawn to New Horizon's **Graphics Designer** and a near-release version of **Professional Page 2.0** (Gold Disk). Surrounded by the colorful banners, miniatures, and newsletters it creates, **Pelican Press** (Pelican Software) drew equally large flocks of admirers. A few aisles away, Right Answers Group proved the long wait for **The Director Version 2.0** was worthwhile. To help you find and organize all your new graphics, Zardoz Software offered **ImageFinder**, an innovative indexing program that shows you miniatures of your images instead of just their file names.

Without doubt, the most attention-grabbing, nongraphics program was **AudioMaster III**, which Oxxi demonstrated continuously at ear-splitting levels. Also of merit were **Vista 2.0**, Virtual Reality's terrain generator, and **Rx_Tools**, an Intuition interface for ARexx from TTR Development.

If the promise of this AmiEXPO is borne out, you could soon be using an 040-, 24-bit-based Amiga with a gigabyte of memory and an optical drive (if your checkbook can handle it). Stay tuned for the next EXPO (March 15–17 in New York City), but note the name change. In a marriage of AMI Shows and AmigaWorld/IDG Communications, AmiEXPO became AmigaWorld EXPO.

—LBL and LRW

Chicago Blues

ROSEMONT, IL—Chicago, known to music lovers as the home of blues, was the site of October's World of Amiga, a show whose modest attendance made some exhibitors blue.

A conflict between concurrent Amiga shows was blamed for the low turnout of both developers and attendees. Exaggerating the sparse attendance was the vastness of the Rosemont Convention Center, where the event took place.

A tangible demonstration of the fact that Amiga developers were torn between the World of Amiga and AmiEXPO California was Commodore's own booth. This massive modular structure—with impressive displays of graphics, multimedia, music, CAD, and the A3000—appeared to have been split in half to accommodate both shows.

Gold Disk made the grade as well as the event by displaying several new products. Company representatives demonstrated the long-awaited **Professional Page 2.0** layout program, lavishing its newest features on the faithful. Text and graphics rotation, style and paragraph tagging, a new Pantone Matching color-reproduction system, and 24-bit color support head the features list. The company's desktop-video production and presentation system, **ShowMaker,** gathered a group of its own admirers, as did **Gold Disk Office**, a combination spreadsheet, word-processing, business-graphics, database, and desktop-publishing package.

Xetec introduced an industry-first CD-ROM drive, the **CDx-650 SCSI**. Xetec's baby reads standard ISI 9660/High Sierra discs as well as conventional compact discs through stereo line-out or headphones. With each of its CDx-650s, Xetec throws in a CD containing over 400MB of software that features the entire Fred Fish collection.

GVP's **Series II Impact** RAM-expanding SCSI hard-disk controllers gave observers a run for their money. Close attention was paid to the company's 600MB Magneto-Optical removable drive, which allows you to overwrite cartridges again and again.

Lake Forest Logic drew passers-by with images displayed and printed using its new high-resolution paint program, **Macro Paint**. The package converts 24-bit scanned or digitized IFF pictures into its own 12-bit, hi-res format.

Amiga-market newcomer TTR Development made its first industry-show appearance at a booth loaded with new products, ranging from its **Sapphire 68020 accelerator to Memory Challenge**, a memory-retention game designed for young children. Also appearing on TTR's roster was **Brigade**, a tactical war-simulation game, and **MRBackup Professional**, a hard-drive back-up program with tape-drive capabilities.

—JJ

Multimedia's Short, Hot Summer

SAN DIEGO, CA—Summer of '90 was hot, and so was multimedia. At least three trade shows, all centered around the theme, occupied this peripatetic producer's agenda. First was the late-August SALT conference in Washington, DC. Commodore made a full assault at this, North America's oldest interactive media show and conference. The company introduced AmigaVision to a virtual who's who of the interactive multimedia industry, and unveiled its video-disc-based, point-of-sale Amiga. Several interactive producers showed their latest Amiga applications. According to lucky attendees, private showings of CDTV compared favorably to the demonstration programs running in the Phillips CD-I (Compact-Disc Interactive) booth next door. Did I detect some tension from the Phillips representatives?

A quick jump to the West Coast took me to the L.A. Cyber Arts Expo, Sept. 6–9. The brainchild of *Mix Magazine* editor Dominic Milano, the conference proved to be as provocative as its name. Intended to foster symbiotic interaction between musicians, computer programmers and artists, the gathering, against all odds, worked. Alas, the Amigas (all three of them) were all but lost among the Macs, keyboards and PCs.

Virtual reality dominated the flashy displays, with MAC, CD-I (no tension here) and PC-based multimedia extravaganzas running a close second. Very Vivid's Mandalla reappeared after a bout with vertical-marketing fever. Although the Very Vivid booth was often unmanned, it was almost never unoccupied, with a constant stream of visitors "playing" the interactive musical application.

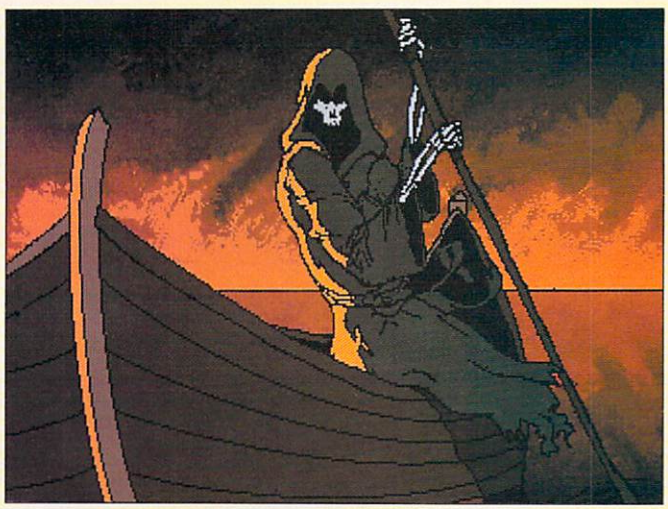
A week and a half later (whew), the "suits" made a comeback at Presentations '90. Although many more Amigas were in evidence at this show than at the previous two, their numbers were still a fraction of the rival platforms; Apple and IBM dominated the Long Beach, California, show and convention. Still, Commodore reprised its Washington dog-and-pony show with a different cast and, once again, wowed the jaded interactive crowd with AmigaVision.

Take note, formerly smug Amiga owners! The competition is closing the multimedia gap. Although the Amiga retains a formidable price advantage, IBM's M-Motion, Action Media boards, and other DVI (Digital Video Interface) products clearly illustrate the importance IBM (and Apple) are placing on this untested technology. One thing was clear: The Amiga needs to make a better showing at industry events if it hopes to succeed in the multimedia marketplace.

—Gene Brawn

Zooming Through Trees with the Greatest of Ease

ARCATA CA—Each summer, the 19 branches of the California State University system pool their efforts and their budgets to allow students to perfect their artistic skills. The result is Summer Arts, the largest interdisciplinary arts program in the Western US. The program site is California State University at Humboldt, on the Northern California redwood coast, and for six weeks the campus is alive with artistic activity, from dance to filmmaking to computer animation.



"Boatman"—by Summer Arts student Steven S. Cummings

This year, ten Amigas ran in one room of the computer lab, and half again as many Mac II's ran in another. Although much of the instructional focus centered on the Macintosh, students were amazed to see how easily 2-D animation can be done on the Amiga. The Mac display, resolution, and color were impressive, but the Amiga's ease of use, sophisticated animation software, short production time, and real-time playback quickly earned a solid group of enthusiasts.

Some students painted animations frame by frame in traditional style, but realized dramatically reduced production times using the Amiga. Pencil tests, coloring, and layering of images are all strengths of the computer medium, and the talented students were quick to capitalize on these advantages.

Next summer's classes are scheduled to include beginning, intermediate, and advanced sessions.

For further information, contact CSU Summer Arts, The California State University, Office of the Chancellor, 400 Golden Shore, Long Beach, CA 90802.

—Joel Hagen

2000-and-1: An Amiga and a Sci-Fi Author

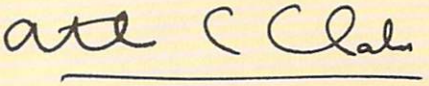
AmigaWorld *editor-in-chief Doug Barney recently received a letter from British science-fiction writer Arthur C. Clarke. Dr. Clarke, who now resides in Sri Lanka, is author of* 2001: A Space Odyssey *(among scores of other books), the originator of communications satellites, and owner of an Amiga 2000. Let's zoom into the middle of the letter, where Dr. Clarke explains what he has been doing with his Amiga . . .*

. . . I use [my Amiga] largely to explore the Mandlebrot Set, which I became obsessed with around 1985, and which is one of the themes of my latest novel, *The Ghost from the Grand Banks*. I've spent many happy hours with MandFXP from Cygnus Software and saved quite a few subsets that I'd discovered.

When passing through the UK in July 1988, I had the privilege of making a television programme with Stephen Hawking and Carl Sagan, "God, the Universe and Everything Else," and I showed Stephen some "Black Holes" that I'd discovered exploring the Set at tremendous magnifications—expanding it to the size of the orbit of Mars. When this programme finally goes on the air, it will show the Amiga to millions of people.

. . . I still have fantasies of getting enough time to do some serious programming on the Amiga, and whether I need it or not, I suppose I won't be able to resist the CD version when it's available.

Meanwhile, my best wishes to all your other Amiganauts out there in Computerland.



—Arthur C. Clarke

Headliners is compiled by Barbara Gefvert. Send your news bits to Headliners, *AmigaWorld* Editorial 80 Elm St., Peterborough, NH 03458.

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You're in the depths of your own worst nightmare . . . but this time there's no waking up.

Lost and alone in a dangerous and alien world you must discover where you are, how you got there . . . and how you're going to get out!

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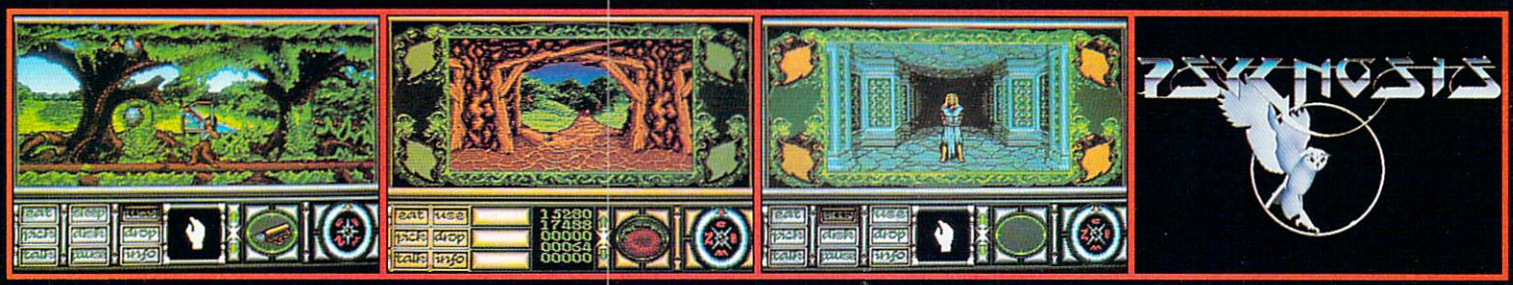
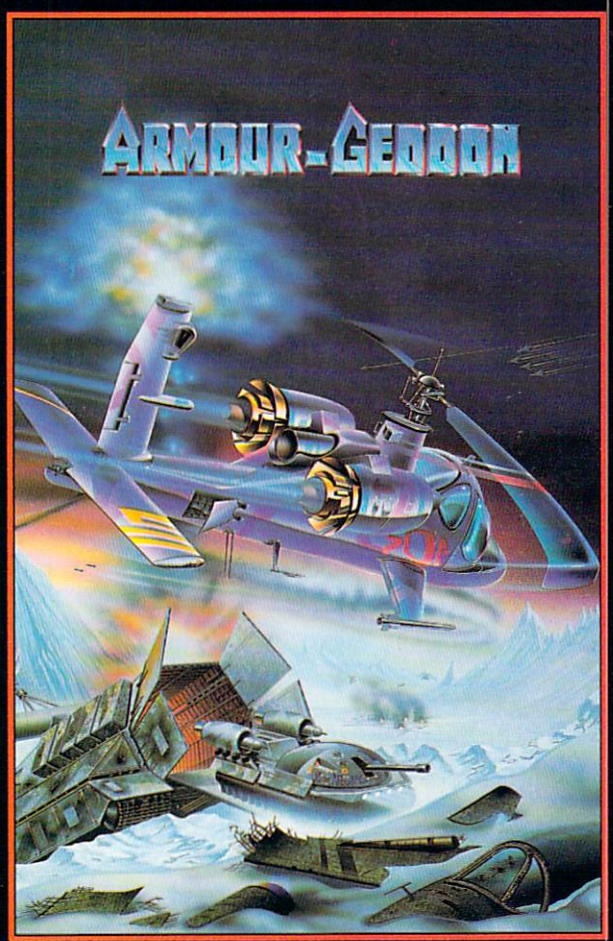
Impelling RPG with more than a dash of hack-'n'- slash.

Screen shots from the Amiga version.





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Screen Shots from the Amiga version.

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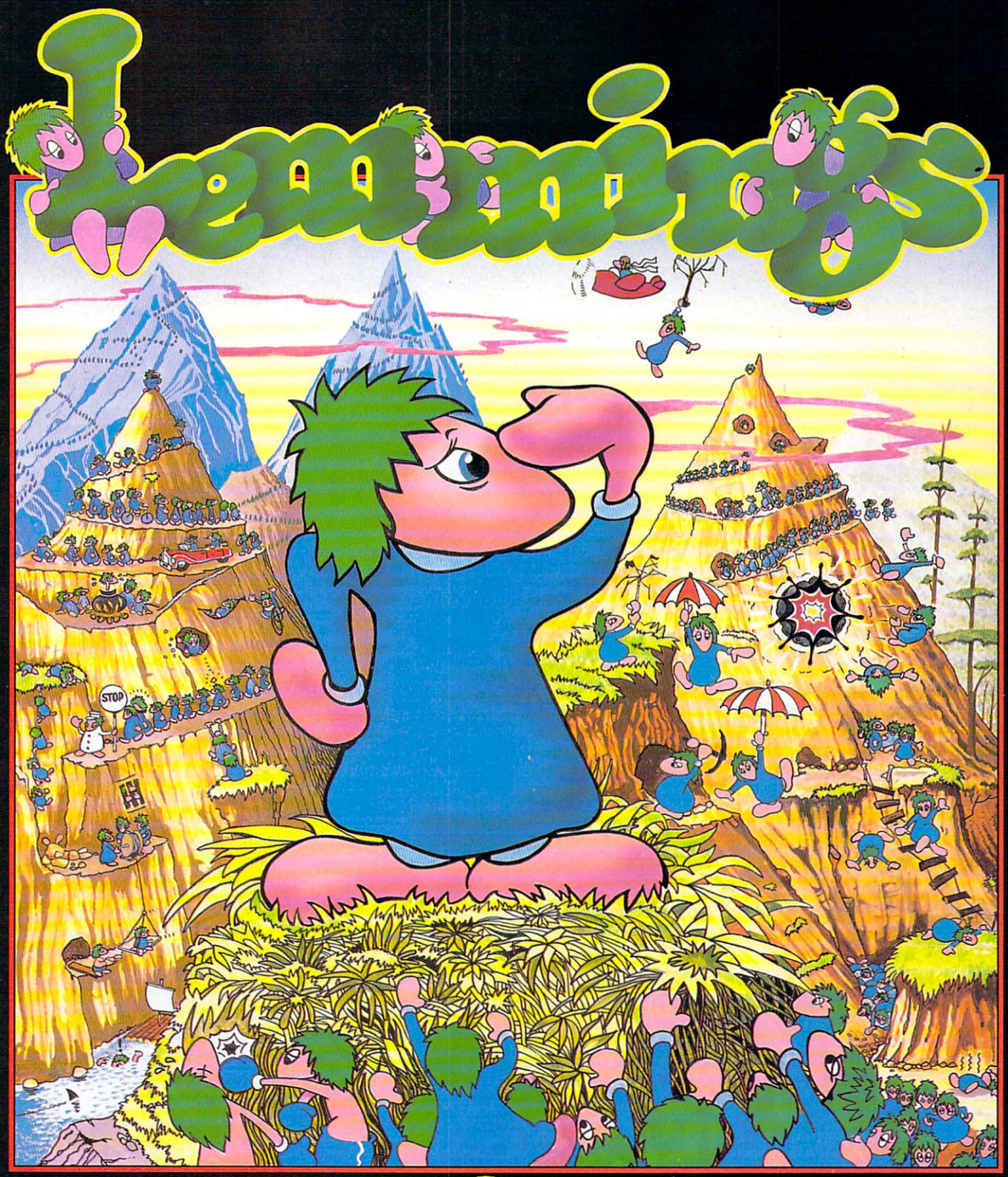

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REVIEWS

DRAW4D

A class by itself

By Geoffrey Williams

ALTHOUGH CATEGORIZED BY its manual as a multidimensional structured-drawing and animation program, Draw4D is neither a replacement for Gold Disk's Professional Draw structured-drawing program nor a competitor in the latest generation of 3-D animation software. It sits somewhere in between, offering unique capabilities.

Draw4D's primary users will probably be desktop publishers who need to make three-dimensional drawings. Those interested primarily in 3-D as such will turn to such heavy hitters as Imagine (Impulse), Animation:Journeyman (Hash Enterprises), or LightWave 3D (NewTek). As an adjunct to Professional Draw and Gold Disk's layout program, Professional Page, Draw4D offers some interesting capabilities.

When you boot Draw4D, you see two lines in the horizontal plane rotating from the center of a vertical line. These color-coded lines represent the X (red), Y (white), and Z (black) axes, around which you draw your object. You can stop the rotation with the spacebar and begin drawing, or you can choose an X, Y, or Z view by clicking on one of the boxes in the upper-right corner of the toolbox.

Once you have drawn an object, you can rotate it in real time along any of the axes using the number keypad. In fact, you can rotate it along all three axes at the same time. This makes it very easy to change your drawing view or the angle of the object. Rotation is very smooth on an A3000, and even reasonably fast on an unaccelerated A1000. If you are new to 3-D, this method is probably easier to understand than the tri-view approach employed by other 3-D software. It enables you to rotate and see the object as if it actually were a three-dimensional solid.

Unlike Professional Draw, Draw4D is based on polygons rather than bezier curves. In a polygon-based system, a circle is made up of a series of short straight lines connected at wide angles. The more lines, the more smooth and round the circle appears. While common in 3-D programs, this approach is a serious limitation for structured drawing software. Draw4D was not, however, designed to stand on its own. To take full advantage of it in desktop publishing, you need Professional Draw for shading, touching up, and adding detail to an object. Draw4D is not an illustrator's tool, but a tool for creating three-dimensional objects.

TO THE POINT

Everything in Draw4D is point-based. For example, a triangle has three points. To change the triangle's shape, you grab one of the points and move it. Add one point to transform it into a rectangle, or multiple points to change it into a circle. To join two objects, you attach them by their points, not by the lines that make up the objects.

While you can draw objects freehand, the several built-in primitives let you automatically make squares, cubes, triangles, pyramids, arcs, and spheres. You create objects from a series of polygons, and can manipulate them either individually or in groups in a variety of ways. You can clone, stretch, mirror, and slant them by setting the proper parameters and clicking on the appropriate icon on the toolbar.

The tools that transform simple two-dimensional shapes into three dimensions are very powerful. Extrusion is easy, and you can adjust the size of one end of the extrusion to change a square into a pyramid or a circle into a pointed spike. The Sweep tool works like a lathe, transforming a circle, for example, into a sphere or a donut, depending upon where you set the center.

A favorite feature of mine is Pipe Extrude: First, you draw a basic path, such as the curve in Figure 1, for the extrusion to follow. You then create a template shape for the extrusion, as in the pentagon in the upper-left corner. The program extrudes the pentagon shape along the curve's path, creating the teacup handle in Figure 2. This is a very powerful tool that is easy to use, and it greatly simplifies the creation of complex objects.

Draw4D lets nonartists create drawings that would be beyond their abilities otherwise. Making a drawing of a pen, for example, is easier for me in Draw4D than it is in Pro Draw. I would create a

YOUR TURN!

I have only had Draw4D for a couple of weeks, but I've gone through the whole manual and found it not as friendly as some other software manuals. It is set up like a textbook, so it's hard to follow; you really have to dig in to get through it.

The program, on the other hand, is very powerful and does a good job of object creation. It gives you control over all the points in a polygon. It's pretty stable, too; I haven't seen a guru once.

As far as things I wish it offered, I would list texture mapping, IFF-brush mapping, and ARexx support.

George Lunger
Lisbon, OH

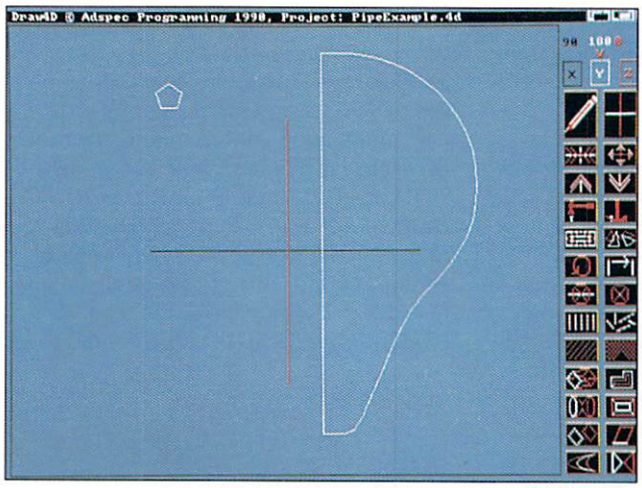

Figure 1. In Pipe Extrude mode, the pentagon at the upper left will be extruded along the path drawn on the right.

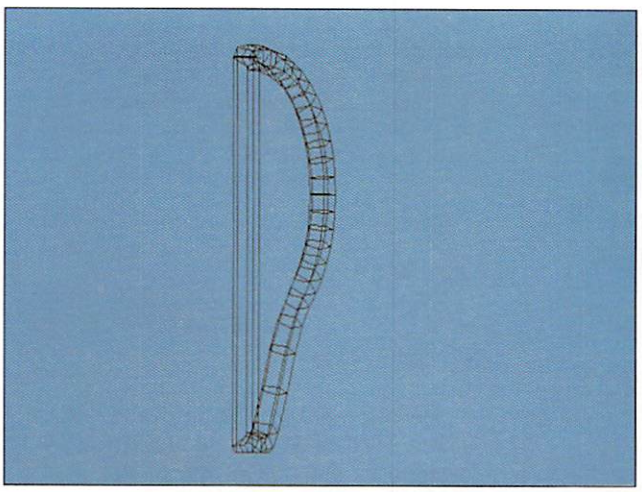

Figure 2. Here's the resulting 3-D teacup handle.

circle, extrude it into a cylinder, taper one end, extrude a smaller cylinder for the top button, draw an outline of the pocket clip, and extrude that. Draw4D handles the most difficult parts, which deal with perspective and curves.

Tweaking Text

Draw4D has very good text support. Two fonts are included, and also the ability to create your own font sets. Your fonts do not have to be letters of the alphabet; they could be architectural objects or any set of symbols you might want to assign to the keyboard. In addition, the company promises to release new fonts in the near future.

You can use all of the polygon tools on text, including Pipe Extrude. Creating extruded text and slanting it in perspective is a snap. Once extruded, the entire character set can be saved as a 3-D font. You can create a lot of very impressive text effects this way, and I think this is one of the program's best features.

Once you have created an object, you can enter Render mode and create a solid view in your choice of resolutions, including HAM mode. Unfortunately, this is one of the weakest parts of the program. You can set the direction and intensity of two light sources, but Draw4D does not do ray tracing, so you cannot make objects cast shadows or reflect other objects. For gray-scale desktop-publishing reproduction, the quality is fine, but for professional video work, the results are unacceptable. HAM mode works pretty well, but the dithering routines for nonHAM images are not very good and do not approach the excellent dithering in Pro Draw. Even at their best, the images look cartoonish and far below the standards set by the best 3-D programs.

Obviously, a lot of work went into the program's animation features. Animation is easy: You can transform any polygon into a path that any other polygon or object will follow. Most of the tools that you can use on a polygon you can also use on a path. You can link paths and easily set speeds and acceleration or deceleration rates along the path. Very complex movements can be created fairly easily. There are both Wireframe and Quick preview modes, so that even on an A1000 you can get a good idea of what your animation will look like before you render it.

Clips in 3-D

The program's real strength is its ability to save three-dimensional objects as Professional Draw clips. You can create whole sets of objects and then, when you need them, you can angle them into position on your current project and save them out as clips. This is something you just cannot do in a 2-D program, and it gives you a wide range of flexibility in using the objects you create. There have been many times when I needed perspective on a piece of clip art and had to redraw the entire image to make it look right. With this capability, you can position and take a snapshot of the "real thing."

Draw4D also saves in its own format, but it does not save in formats compatible with any other programs. This makes it a dead end as a 3-D development tool, because many people like to model in one program and render in another. It is also unfortunate because Draw4D is a very nice modeler. While there is no standard 3-D file format, if Draw4D supported just one of the major 3-D formats, you could use its objects with other programs by way of a translation utility.

I was also disappointed to find that Draw4D cannot load in anything but its own format—not even a Pro Draw clip. I had been looking forward to digitizing an object, using Pro Draw's autotrace feature on it, and then popping it into Draw4D to extrude it into three dimen- ►

sions. Alas, this is not possible. Increased compatibility with other programs is very important for the future success of Draw4D.

All in all, I like the program, but it has flaws and limitations and does overreach itself a bit. As a tool for creating 3-D drawings for desktop publishing, it is easy to use and does the job quite handily. As a 3-D animation tool, it has powerful capabilities but is limited by the quality of its output and an inability to export objects into other 3-D programs. You can create complex animated movements, but the objects themselves lack realism and detail. Animation capabilities may be all that you need, but I would not buy it for this alone. For desktop publishers, however—especially nonartists like me who wind up having to draw anyway—it is definitely worth consideration.

Draw4D
Adspec Programming
PO Box 13
Salem, OH 44460
216/337-3325
$249
No special requirements.

Mega-Midget Racer

Power to the masses

By Sheldon Leemon

UNTIL THE RELEASE of Mega-Midget Racer (MMR), A500 and A1000 owners could only imagine the exhilaration of running programs eight to ten times faster than on their stock machines. With these users as well as A2000 owners in mind, CSA, first in bringing Amiga accelerator boards to market in years past, introduces the one-size-fits-all 68030 accelerator. Following on the heels of the company's low-cost 68020 accelerator, Midget Racer, MMR represents its next step in bringing increased processing power to the Amiga.

In a word, the Mega-Midget Racer's design adds up to flexibility. You can install the board easily by plugging it into the 68000-processor socket of any A500 or A2000. A little more work, however, is required for an A1000 installation because the board overlaps the disk-drive area. A1000 owners can either convert the internal drive to an external floppy or pay CSA an additional fee to modify the disk-drive cage with a new 1/3-height model.

MMR's CPU and 32-bit RAM each come on separate plug-together modules, which makes for a wide variety of configurations (and prices). While a bare board lists for only $675, the 33-MHz model with a 33-MHz 68882 math coprocessor, 8MB of 32-bit dynamic RAM, and 512K of 32-bit static RAM will set you back $3892. Our test model, a 25MHz 68030 and 68882 with 2MB of dynamic RAM (DRAM) and 512K of static RAM (SRAM), lists at about $2000.

I just added the memory expansion board to MMR, so I have not really had a chance to test it, but in 16-bit memory, it is the nicest of the accelerators. After trying the board with several major programs, my only problems have been with games. It doesn't seem to make any sense that they will not work in 32-bit memory, but there's real 68000 on board, so I can switch back for games.

Karl Kugel
Chatsworth, CA

The basic Mega-Midget is a rather small board (4×5 inches) socketed for a 68030 processor (required) and 68882 coprocessor (optional), four static RAM modules, and your 68000 processor. To install it, remove the 68000, plug it into the MMR, and then plug the assembly back into the 68000 socket. The hardest part of the process is opening up your computer to get to the 68000, but clear instructions are provided. A500 owners need a Torx screwdriver to open the case and remove the metal shielding. A2000 owners must remove the metal cage that holds the disk drive and power supply. Installation should take no more than ten minutes, even if you've never taken your computer apart before.

Calculating Decisions

You can add two options to the main board itself. To install a 68882 math coprocessor, simply plug the chip into the waiting socket. As with most accelerator boards, the MMR allows you to run your math chip at the same speed as the 68030 processor, or at a higher speed by adding a faster crystal. Your decision on whether or not to add a math chip should depend upon the type of programs you typically run. The vast majority of Amiga programs do not use high-precision floating-point math, so they will not run any faster with a math chip. The only programs that use such chips are spreadsheets, CAD, and 3-D rendering programs. Adding a 68882 will do nothing for most paint, presentation-graphics, or video-titling programs.

You can also add up to 512K of 32-bit static RAM to the main board by using the four sockets provided. Static RAM is faster—and much more expensive—than dynamic RAM. (The list price on the full 512K is $399 as compared to about $40 for comparable DRAMS.) You can use static RAM as fast 32-bit memory, which, as we will see later, makes a big difference in the performance of this system. With a utility provided, you can move the code for Kickstart 1.3 into 256K of this memory. Running Kickstart out of 32-bit memory accelerates all programs that use the Amiga interface because such programs rely heavily on code within the Kickstart ROM.

Considering its high price tag, many people may conclude that SRAM is not cost effective, especially as you can achieve similar results more cheaply with an optional DRAM board. SRAM prices are falling, however, and if the cost becomes comparable, MMR is ready. Also, CSA maintains that the same four sockets used for SRAM can be used for Kickstart ROMs (or EPROMS) if it can license Kickstart 2.0. If this happens, it will provide an inexpensive solution for 32-bit access to Kickstart as well as an opportunity to upgrade to version 2.0.

If you prefer, you can add less-expensive dynamic RAM to MMR with a Mega-Memory expansion board. Mega-Memory plugs into the end of the MMR and about doubles its size. The socketed board accepts either one or two megabytes of DRAM 256×4 DIP chips, or four or eight megabytes of DRAM 1mx4 DIPs. CSA also plans another, smaller version of the the board that will use ZIP-package RAM chips and will not be

Continued on p. 20

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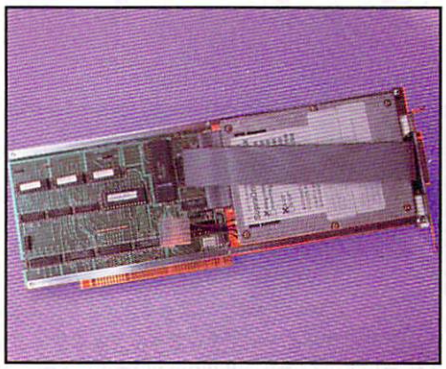

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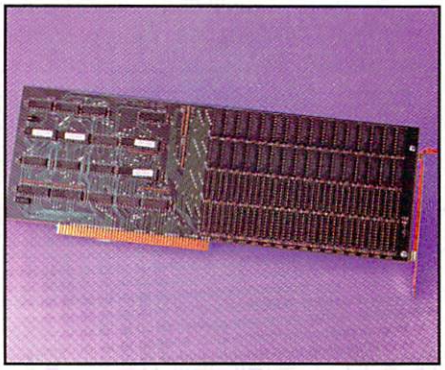

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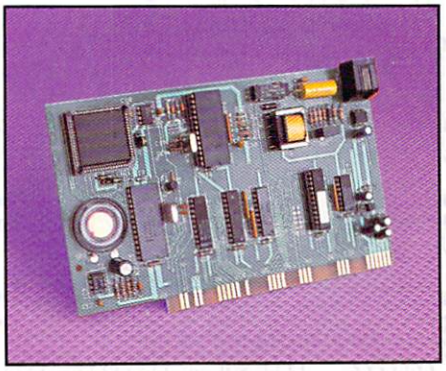

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From p. 16
upgradable. This scaled-down version will not overhang the A2000 video slot as the current board does. The company plans a liberal trade-in policy that will allow you to choose another RAM board or increase memory. Both RAM boards have special circuitry that enables them to tailor performance to the speed of the RAM chips used (from 100 to 60 ns), so you should get better performance with faster RAM.

Although you do not need 32-bit memory to run MMR, the board will not perform anywhere near its peak level without it, because the processor can execute instructions only as quickly as it can fetch them (and their associated data) from memory. When the 68030 talks to the 16-bit bus, it must slow down to normal Amiga speed, largely negating the power advantage. A Mega-Midget Racer running without 32-bit memory performs about three times faster than a normal Amiga (or roughly the speed of a Commodore 68020 accelerator board with 32-bit memory), but that's still only about a third as fast as it will go with 32-bit memory attached. With 32-bit RAM, you can gain even more speed by moving Kickstart into this RAM with Dave Haynie's PD program, SetCPU.

Unlike most other accelerators, MMR's memory does not auto-configure—meaning your Amiga will not recognize extra static or dynamic RAM until you add a configuration program to your startup-sequence. On the other hand, because MMR adds memory at addresses outside the normal range of Amiga auto-config space, any memory you add via the MMR will not count towards the 9-MB auto-config ceiling. This means you can add 8MB of MMR RAM *on top of* the normal 9MB of system memory.

Hard Facts

Using a set of tests I devised for a previous review of the Commodore 2630, GVP Impact accelerator, and Hurricane 2800 (see Jul. 1989, p.38), the MMR configuration used (25MHz processor and coprocessor, 2MB of DRAM, 512K of SRAM) ran at about the same speed as most other 25MHz 68030 configurations (including the A3000), and within about 10 percent or so of the 28MHz GVP board. Consequently, the MMR should be considered roughly comparable to other accelerators in its class.

While 32-bit memory provided a big boost in speed, the MMR's performance without it was similar to that of the old 68020-based A2500/20 with 32-bit RAM. Software compatibility was similar to these other boards, with no noticeable problems except for certain copy-protected games. The MMR board lets you switch back to 68000 mode via software if you run into any compatibility problems. About the only problem I encountered while testing the board was with A-Max II, the Macintosh emulator, which functioned somewhat erratically. But A-Max II owners have had problems with other accelerators, too, according to CSA. The fault is with A-Max II, not MMR.

I was quite favorably impressed with CSA's Mega-Midget Racer board. It is neat and well-designed, using a number of custom parts and surface-mount technology (a fairly sophisticated design approach). It is flexible enough to allow users to tailor the system to suit their needs (and pocketbook) and also to transfer to another system when it's time to upgrade. CSA is a well-established company, and I have always found the technical support staff to be knowledgeable and helpful. Most of all, I was impressed with the sight of a mere A500 running as fast as an A3000 or a Macintosh IIci. Going back is tough indeed.

Mega-Midget Racer
CSA
7564 Trade St.,
San Diego, CA 92121
619/566-3911
$675
No special requirements

A2232 Multi Serial-Port Board

Seven ports in which to dock when the serial storm descends

By Lou Wallace

IF YOU USE a wide variety of hardware, one troublesome problem you are sure to encounter is the need to access two devices that require the Amiga's single serial port. For example, you may want to hook up both an external modem and a laser-disc player, both of which join at the serial port. Maybe your printer uses the serial port, too, or perhaps you want to interface with other computers to create your own mini-network. You might also want to set up a multiline BBS, but with only one serial port you are limited to a single line. In all of these cases, the best solution is a multiple serial-port card.

There are a couple of such cards on the market that provide two serial ports, but Commodore's own answer is the A2232, a seven-port serial card for the A2000 and A3000 series of computers (there is no A500 or A1000 card). Because the Amiga's standard serial port is still available when the board is installed, the device gives you a total of eight serial ports. (If you wish, you can add multiple A2232 cards; each board will add another seven ports.) In order to fit seven ports on a single card, Commodore configured them as small, round, mini-DIN ports and tucked seven mini-DIN-to-DB25 serial cables in the package. To attach a standard serial device to the board, you need only use one of the cables.

Installation of the hardware is very simple; just open the computer and insert the card into any of the available 100-pin slots. Before performing the actual installation, however, you should first determine whether the devices you wish to connect require any modification. The A2232 uses pins 2 and 3 to transmit and receive data, respectively. If your serial device requires the opposite setup, and if the cable you are using cannot perform the switch, you can swap the pins using the jumpers that the A2232 provides for each port. While most devices do work in the A2232's default configuration, it will save you some trouble if you check before installing the board in the computer.

On Disk

Once you have inserted the board and reassembled your machine, you need to install the accompanying software. The two most important items to be added to your system are a serial.device driver (for the SYS:DEVS directory), and a new Preferences program. The new serial.device supports more than one serial peripheral, while the Preferences software has an option for designating which of ►

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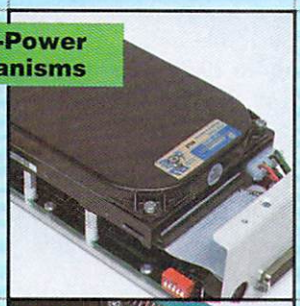

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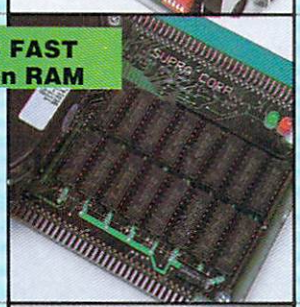

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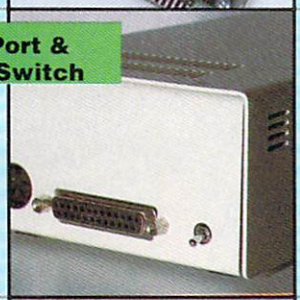

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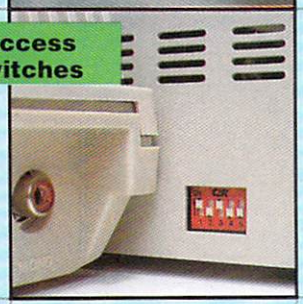

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the eight serial ports is to be the default. The A2232 sets up the standard Amiga serial port as port 1, and numbers the ports it provides as 2–8. By using the new Preferences to select any one of the eight as the default, software can work with whichever port you want it to use, not just the standard Amiga port.

Among the other supplied software are a copy of Commodore's AmigaTerm (a telecommunications program that supports multiple serial devices) and some examples of mountlists. Also included are new versions of the AmigaDOS MOUNT command, the Aux-Handler, and the Port-Handler, which are necessary in using the A2232 (the Aux-Handler is used when adding multiple terminals to one Amiga).

The supplied Install program copies the new versions of software to your system disk, but unfortunately it does not actually add any mountlist entries for you. For those with experience in editing a mountlist, this should not be a problem, and even novices should not find the procedure too difficult if they follow the examples that are supplied.

Give 'Em the Hook

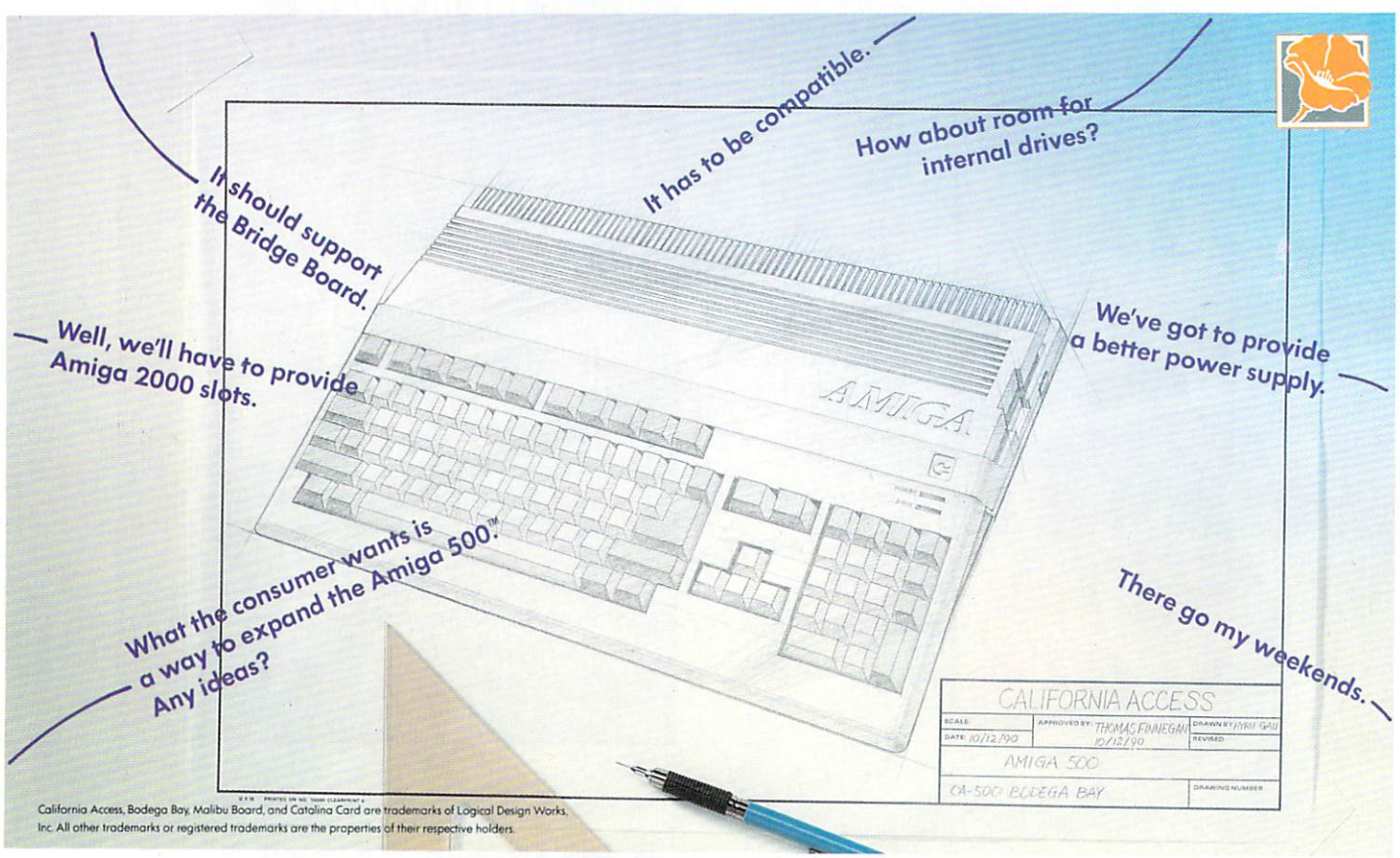
Once I had the board and software installed in my A2000, I added a modem to one port, a Sony LDP 1200 laser-disc player to a second, and a null modem connected with a different computer to a third. Using AmigaTerm, I accessed the modem while AmigaVision (Commodore's authoring language) controlled the laser-disc player. Meanwhile, I used the null modem to send and receive data to and from the other computer.

According to the documentation, the A2232's serial ports support speeds from 50–19,200 baud. Because of some oddities in the A2232, however, it is technically possible (although the documentation does not mention it) to reach a baud rate of 115,200. I did not try this speed myself, but AmigaTerm does support it, and, supposedly, any other software that requests the 115.2K baud speed can get it from the A2232. There are no supported speeds between 19.2K and the "magic" 115.2K baud rates.

The A2232 solved a nagging problem I'd had in using AmigaVision to control DigiView (NewTek's video digitizer) via ARexx (the inter-process control protocol included in AmigaDOS 2.0 and available separately from William Hawes). I wanted AmigaVision to sequentially change frames on the laser disc and then send a command to DigiView (which joins the Amiga through the parallel port) to digitize the image, so that I could automate the creation of a digitized animation. The problem was that as soon as DigiView digitized a frame, AmigaVision lost control of the serial port and the laser-disc player. I solved the problem by using one of the A2232 ports instead of the serial port.

For me, the A2232 was a useful solution to a problem. If your needs are such that multiple serial ports running up to 19.2K baud will be of help, then you should look into the A2232.

A2232 Multi Serial-Port Board
Commodore Business Machines
1200 Wilson Dr.
West Chester, PA 19380
215/436-4200
$399
No special requirements.



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EASYL 1.3

SKETCHMASTER

APRODRAW 2.4

If you've got a headache from trying to draw with a mouse, take three tablets and . . .

By Gene Brawn

A FEW YEARS ago, when I first tried a drawing tablet, I found it awkward to use. Its cursor was erratic and unable to keep pace with my drawing. Thankfully, competition has forced vendors to produce more intuitive, responsive software, and the Amiga now sports three makes of digital graphics tablets (Anakin's Easyl 1.3, Dakota's SketchMaster, and R & DL's AProDraw 2.0), with a fourth (from Centaur Software) in the wings. These easy-to-use input devices are attracting traditional artists who are more comfortable using an electronic pen and pad than a mouse.

Animators love them. Using a graphics tablet as an animation table, the artist employs a stylus to trace the animation into the computer cel by cel. Special scaling software, provided with any tablet worth its electrons, allows engineers and draftsman to adjust the screen's scale to match that of a mechanical drawing. Using a puck to enter data point by point from a blueprint directly into a 3-D modeler couldn't be easier. A less obvious application is using a tablet to input database information from standard, pre-printed forms: Simply place the completed form on the pad and point to the items to enter (check boxes work best).

Easyl's 1.3 software seems faster than the earlier versions; lines certainly fill quickly. I like it a lot better!

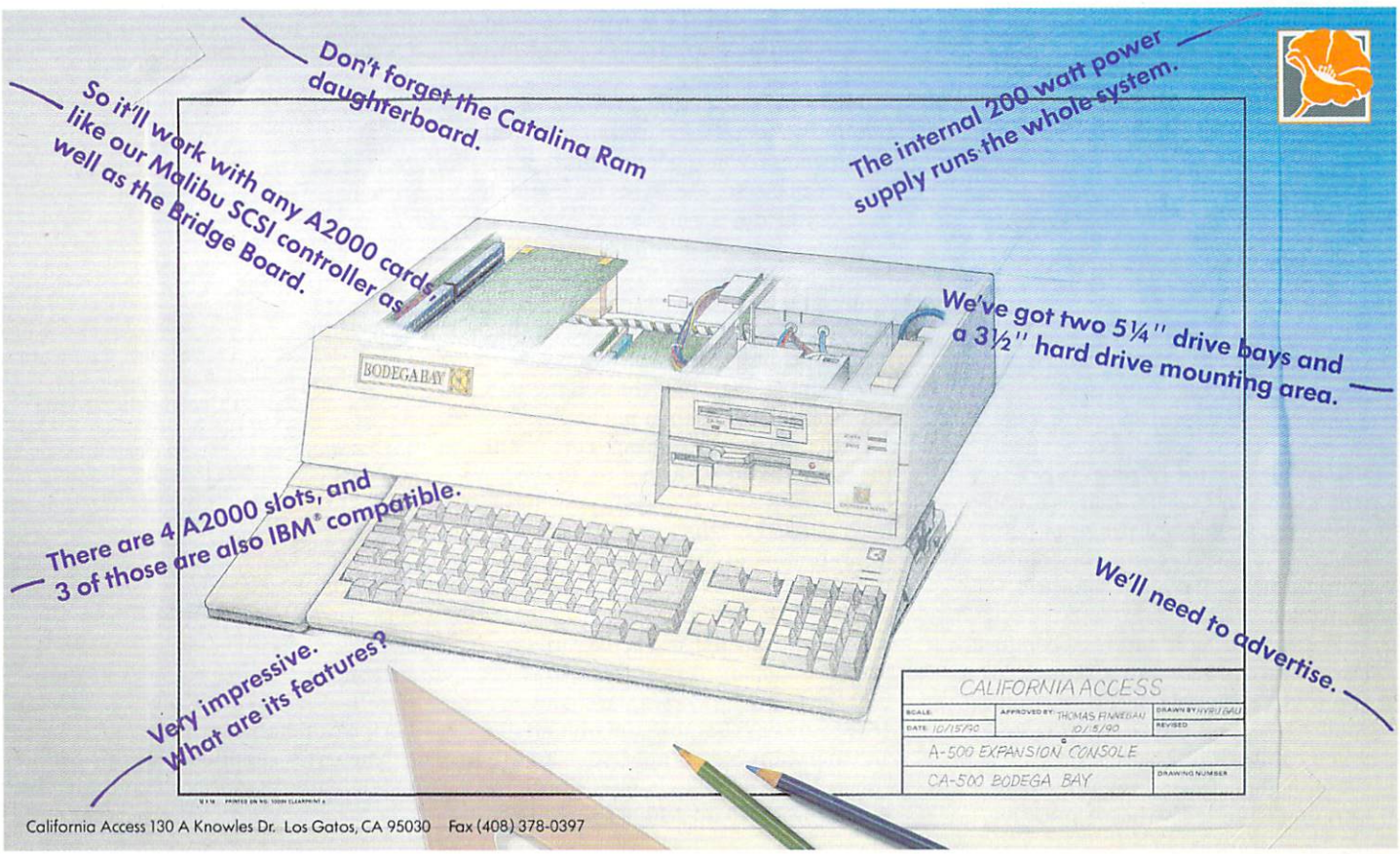
Al Sanders
Goderich, Ont. Canada

TWO FOR THREE

These three tablets use two disparate input technologies. With the Easyl, you can use any blunt object to apply pressure to the pad's surface and thus position the cursor. Two buttons on the Easyl's frame allow you to emulate mouse-button clicks. Both AProDraw and newcomer SketchMaster, on the other hand, provide a plug-in electronic stylus, which you hold in contact with or slightly above the surface of the tablet to direct the cursor. To simulate a right mouse-button click, press the button on the stylus barrel; to simulate a left mouse-button click, gently push the stylus tip against the pad. Both of the latter systems also include a puck as an alternate input device. Similar to a mouse without a roller ball, each puck has three buttons and a crosshair.

EASYL 1.3

The granddaddy of Amiga digitizing tablets is Easyl 1.3. The pad sports an active ►



Circle 42 on Reader Service card.

drawing area of 8.5 × 11.5 inches and mates to the expansion port of the A500 and A1000 via a custom controller box with a pass-through connector. The A2000 controller is supplied on a card. Just plug it in and run the software driver, and you are in business. Power is provided courtesy of your Amiga, so if you have a fully-loaded computer, beware of the possibility of overloading your system's power supply.

Anakin has gone to great lengths to respond to users' needs; the product is much improved over earlier versions. "Lefties" will appreciate software options that orient the pad's mouse-control buttons to their frame of reference. Excellent scaling and set-up utilities are also included, as is a paint program (although I'm not sure why they bothered, considering all the paint software available).

The Easyl is light and rests comfortably on my lap. Its input approach allows you to draw directly into your Amiga while preserving the tactile drag and visual feedback of graphite on paper. Because the tablet uses pressure technology, no connected stylus or puck is needed (or supplied). Just place a sheet of paper onto the pad and draw; the pencil's pressure moves the pointer. I thought I would prefer the barrel-switched stylus supplied with most tablets, but after working with Easyl for some time, I'm not so sure—there is something seductive about pencil against paper.

SketchMaster

The newest company on the scene, Dakota, supplies its SketchMaster tablet, manufactured by GTCO, in two sizes: 12 × 12 inches and 12 × 18 inches. Standard equipment includes scaling software, a stylus, a puck, and an external power supply. A nice touch is the plastic overlay that holds and protects paper documents.

Apparently, the tablet gets extra power from the serial port, because it works with the A1000 only if you add a resistor to the power pin on the serial cable. You need to know your way around a soldering iron to make the modification. To hook up the hardware, plug in the power supply and connect it to the pad; then connect a second cable, which extends from the tablet, to the serial port. You set the system-configuration options, including the size of the active drawing area, from the Workbench icons or from the Info requester.

That's the good stuff; here's the bad: A bug in the stylus software causes the cursor to go crazy in the lower third of hires screens. Also, the stylus tip is simply too big for fine tracing work.

Neither was I comfortable with the stylus for heavy point-and-click work. When I turned to my mouse for relief, I discovered that it did not work when the stylus was plugged in. If you need mouse functions while you use the pad, you will have to use the puck.

Although scaling software comes with the SketchMaster, it is not up to the level of the other two packages. Unfortunately, based on the unit I tested, I cannot recommend SketchMaster.

APro Draw 2.0

R & DL Productions sells the SummaSketch II line of pads in three sizes: 9 × 6 inches, 12 inches square, and 18 × 12 inches. Because the unit employs an external power supply, you can use a "plain Jane" gender changer to connect the hardware to an A1000's serial port. Complete with AProDraw, R & DL's proprietary driver, the package includes configuration and scaling software, as well as a stylus and a puck.

Another Amiga veteran, R & DL has obviously invested a lot of time to improve its software. The comprehensive scaling program, with its simple point-and-click interface, makes resizing easy. The cursor is very stable (after an occasional hiccup), and an old problem with DeluxePaint's (Electronic Arts) overscan mode was finally fixed. (Easyl and AProDraw also accommodate overscan.) Hooking up the tablet would be easier if the manual had diagrams, especially one that shows that the power cord plugs into the serial-port connector. I had a heck of a time with this.

The stylus supplied with this pad is much better than that offered for Sketch-

Continued on p. 94

YOUR TURN!

SketchMaster is really good, and while its capabilities are similar to AProDraw's, it is less expensive. Dakota seems to be a consumer-friendly company, interested in promoting software applications.

It works perfectly with Digi-Paint. One problem I found with DeluxeVideo III is that although it works while you are creating a storyboard, it is not compatible with the play option. I understand, though, that Dakota is working to fix this bug.

SketchMaster's driver is quick and small, and although it does not have a power supply, I found that it worked fine on a stock A2000, on an A2000 with a 68030 processor, and on a fully-loaded A500. The plastic overlay is nice, and both the hardware and software are easy to install.

The package includes drivers for DOS, so you can use it with IBM compatibles. Also, the tablet's connector is nine-pin IBM style, with a 25-pin, Amiga-standard converter.

Ray Adams
Tucson, AZ

YOUR TURN!

As director of the Mountain Valley Arts Council, I use AProDraw 2.2 and an Amiga in working with kids in grades four through six. Using the scaling and configuration software, I offset the top edge of the 12 × 12 pad so that the active working area is confined to the lower two-thirds. By doing that, we can hang the keyboard off the edge of the tablet and use both it and the pad in controlling DeluxePaint.

When selecting DPaint's shape-drawing commands, input from the tablet is slow and tends to overshoot. For such things, the mouse is faster and more effective. We find, however, that using the pen is easier than the mouse for freehand drawing. AProDraw is very intuitive; in fact, nothing else does as good a job. We used a pressure-sensitive pad, the Easyl, for a while, but found that kids were forever leaning on it, causing the cursor to move to the spot they were touching.

With version 2.2 of the software, R & DL cleaned up a lot of bugs. There are still incompatibilities with some software, though—I think because AProDraw works at the system's exec level. I was using the Q-Mouse program to blank the pointer, for example, and found that once the pointer disappeared from the screen, it wouldn't come back without a mouse present.

John Dandurand
Guntersville, AL

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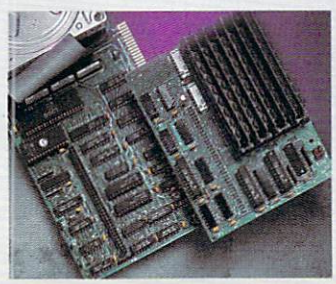

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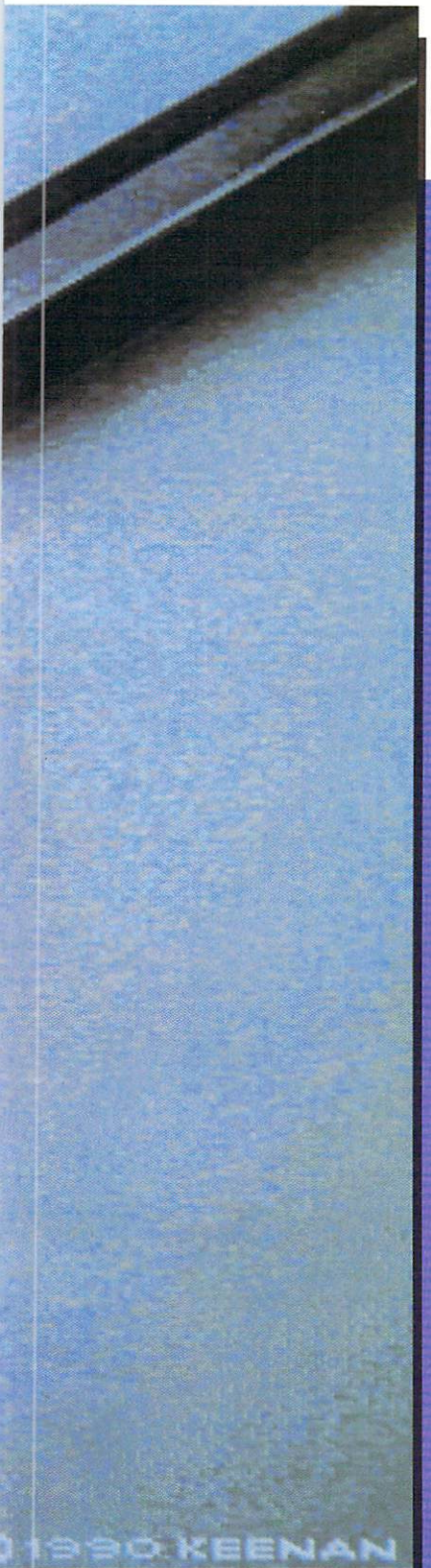


A Case in Paint

We'll play Holmes to your Watson as Detective Brawn scrutinizes this Baker's dozen of Amiga paint programs. Whether you need blue carbuncles, orange pips, silver blazes, or just a simple study in scarlet—it's an elementary deduction that you'll find one member of this speckled band that can deliver a solution.

By Gene Brawn

NOT SURPRISINGLY, THE Amiga boasts no fewer than 13 2-D paint programs, plus a few more if you take into account those included in software bundled with other equipment, such as Toaster Paint. Granted, the Amiga is an artist's dream machine, but is that reason enough to justify the creation of so many applications? Perhaps not, but if a program is highly successful, then others will copy it. In addition, if there is a chink in the leader's armor, an entrepreneur will surely exploit it.

A good case in point is **DeluxePaint III** (Electronic Arts). Although it dominates the 2-D paint marketplace, it is by no means the *complete* package. DPaint lacks important HAM capabilities, its text handling leaves me cold, and novices are often intimidated by its power. Enter **Digi-Paint 3** (NewTek) to fill the HAM gap, **Express Paint** (Oxxi) to address the text problems, and, recently, **My Paint** (Centaur) as a candidate for the preschool Picasso not yet ready for a powerful paint package.

This multiplicity of paint programs for the Amiga is a blessing in disguise. Because no one program ►

ILLUSTRATED BY LARRY KEENAN

does it all, I routinely use three or four to complete my average project. Amiga artists are fortunate to have such high-quality, inexpensive graphics software so readily available. Take advantage of this abundance and use the right tool for the job, which is what the 12 comparison charts that follow are designed to help you do.

But First a Word from the Author

Before we get to those comparisons, I have to admit I have my own favorites for a variety of different circumstances. Based on personal experience, here are my proven winners in several categories.

Best Niche Program

It's My Paint, hands down. I had a great time playing with this colorful, noisy program. Designed for kids up to eight years old, My Paint features an animated, iconic toolbox that is as much fun to look at as it is to use. Although the program allows for only 12 colors, that is enough to satisfy the bold, primary-color requirements of the unsophisticated young artist.

Programs up to 64 Colors

DeluxePaint III remains the standard, despite stiff competition from Express Paint and newcomer **The Graphics Workshop** (Holosoft). DPaint's responsive, if not spartan, interface sets the standard by which 2-D paint programs are measured. Fast, functional, and powerful, it is the professional's choice.

Not Much for the Novice

I regret that I cannot recommend any of the programs designed for beginners. **Images** (Oxxi) is creaky with age; **The Graphics Studio** (Accolade) is too limited and too Mac-like for the Amiga environment; and **Spritz** (Oxxi) is so similar to the same company's Express Paint that I wonder why it exists at all. Instead, I advise that even for this category you stick with DeluxePaint III. With a little effort, you will find it works on nearly any level, and it is blessed with a great manual.

24-Bit Color

Both **Mega Paint** (Pseudo Vision) and **Macro Paint** (Lake Forest Logic) have internal palettes of 16 million colors, but each displays its results differently. Macro Paint's ability to work in NewTek's Dynamic HiRes mode is a programming *tour de force*. Regrettably, the software's functionality is severely limited by a small set of basic tools. Mega Paint, too, is crippled by an even more limited toolbox and an innovative, but ultimately disappointing gray-scale interface. In fairness, these applications are designed for frame buffers and 16-million color displays, and this makes it difficult to compare them with more traditional paint programs. Unfortunately, however, both programs seem more like demonstration versions than

About the Charts

Amiga 2-D paint applications can be grouped into five categories, all based in one way or another on color count: "Novice" (which includes the "Kids" designation for My Paint and by which we mean programs with 32 colors or fewer), Extra_Halfbrite (64 colors: 32 plus an additional 32 in Halfbrite mode), HAM (4096), and 24-bit RGB (16 million); the "All" (resolutions) category is the sole province of **Deluxe PhotoLab** (Electronic Arts). It is included here solely to emphasize the need for more applications in this neglected area. Although I tried to provide as much information about these programs as I could, not every function of every program appears in the lists. Some tools I judged to be frivolous, others too obscure.

Chart Symbols:

● = Function or feature available

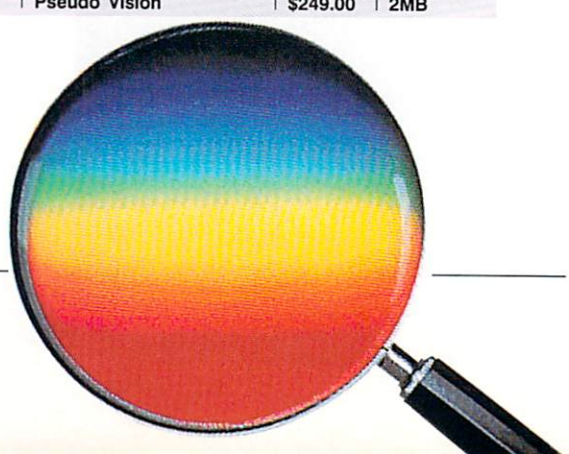
c = Limit of chip RAM

r = Limit of all RAM

Table 1. Amiga Paint Programs

PROGRAM	CLASS	PUBLISHER	PRICE	MINIMUM MEMORY
My Paint	Kids	Centaur	$ 49.95	512K
The Graphics Studio	Novice	Accolade	$ 49.95	512K
Images	Novice	Oxxi/Aegis	$ 99.95	512K
Spritz	Novice	Oxxi	$ 79.95	512K
Chroma Paint	64	Designing Minds	$ 39.95	512K
DeluxePaint III	64	Electronic Arts	$149.95	1MB
Express Paint	64	Oxxi	$139.95	512K
The Graphics Workshop	64	HoloSoft Technologies	$100.00	1MB
Digi-Paint 3	HAM	NewTek	$ 99.95	512K
Photon Paint 2.0	HAM	MicroIllusions	$149.95	1MB
Deluxe PhotoLab	All	Electronic Arts	*	1MB
Macro Paint	RGB	Lake Forest Logic	$139.95	1MB
Mega Paint	RGB	Pseudo Vision	$249.00	2MB

* No longer sold separately, but bundled with DeluxeVideo III for $149.95.



finished applications. I cannot recommend either.

The HAM Wars

A tough choice here, but I go with Digi-Paint 3, despite its studied ignorance of fill and perspective tools. The elegance of its smoothing and shading routines, coupled with a logical and responsive interface, make it a pleasure to use. With all due respect for its power and the novelty of its 3-D texture map-

Continued on p. 34

Table 2. Display Management

PROGRAMS	My Paint	Graphics Studio	Images	Spritz	Chroma Paint	DPaint	Express Paint	Graphics Workshop	Digi-Paint	Photon Paint	Deluxe PhotoLab	Macro Paint	Mega Paint
Menus On/Off		•	•	•	•	•	•	•	•	•	•	•	•
Status Display													
file name				•		•	•				•		
cursor x/y		•			•	•	•	•	•	•	•	•	•
memory status						•	•	•					
mode		•				•			•	•	•		•
frame number						•		•		•			
x/y/z degrees						•	•			•			
Clear Screen	•	•	•	•	•	•	•	•	•	•	•	•	•
Change Resolutions		•		•	•	•		•	•	•	•		
Auto Configure Pix[1]						•	•	•	•	•		•	•
Center Display[2]				•			•				•		•
Center Cursor[3]						•					•		•
Fast Feedback						•	•	•					
Spare													
merge		•		file		•			•	•			
copy					•	•	•	•	•	•		•	
number		1	1		r	r	10	1	1	r	r	1	

Notes:

[1] Auto Configure Pix: Sets the display to the new picture's resolution.

[2] Center Display: Displays the center of the image, regardless of resolution.

[3] Center Cursor: Centers the image beneath the cursor.

Table 3. Display Formats

PROGRAMS	My Paint	Graphics Studio	Images	Spritz	Chroma Paint	DPaint	Express Paint	Graphics Workshop	Digi-Paint	Photon Paint	Deluxe PhotoLab	Macro Paint	Mega Paint
Lo-res	•	•	•	•	•	•	•	•	•	•	•		•
Hi-res		•	•	•	•	•	•	•			•	•	•
Interlace			•	•	•	•	•	•	•	•	•	•	•
Extra_Halfbrite				•	•	•	•	•			•		
HAM									•	•	•		•
24-bit RGB												•	•
Dyna-res/A-res												•	
Overscan													
max horizontal (pix)				704		704	758	672	384	352	r	r	
max vertical (pix)				440		480	440	440	480	480	r	r	
SuperBitmap													
max horizontal (pix)				8192		r	r	1024	1024	1024	r	r	
max vertical (pix)				c		r	r	1024	1024	1024	r	r	
PAL				•		•	•	•	•	•	•		

Table 4. Tools

PROGRAMS	My Paint	Graphics Studio	Images	Spritz	Chroma Paint	DPaint	Express Paint	Graphics Workshop	Digi-Paint	Photon Paint	Deluxe PhotoLab	Macro Paint	Mega Paint
Airbrush		•	•	•	•	•	•	•		•	•	•	•
size nozzle			•	•	•	•	•	•		•	•	•	•
adjust density			•		•		•	•			•		
pattern spray						•		•					
shape													
round		•	•	•	•	•	•	•		•	•		•
rectangle			•	•	•		•						•
custom					•			•					
Freehand													
dotted		•			•	•	•	•	•	•	•	•	•
continuous	•	•	•	•		•	•	•	•	•	•	•	•
filled			•	•		•	•	•	•	•	•		•
Line													
rubber band		•	•	•	•	•	•	•	•	•	•	•	•
radiant		•						•					
Curve													
3-point			•	•	•	•	•	•		•	•	•	•
4-point				•			•	•			•		
arc			•				•						
wedge							•						
Rectangle													
outline		•	•	•	•	•	•	•	•	•	•	•	•
filled		•	•	•	•	•	•	•	•	•	•	•	•
Circle													
outline		•	•	•		•	•	•	•	•	•	•	•
filled		•	•			•		•	•	•	•	•	
center		•	•	•		•	•	•	•	•	•	•	•
corner						•					•		
Oval													
outline		•	•	•	•	•	•	•	•	•	•	•	•
filled		•	•		•	•		•	•	•	•	•	•
center		•	•	•		•	•	•	•	•	•	•	•
corner					•	•				•			
Polygon													
outline		•	•		•	•	•	•	•	•	•		
filled		•	•		•	•		•	•	•	•		
Fill													
boundary[1]		•				•				•			
color[2]	•			•	•	•	•	•		•	•	•	•
brush				•	•	•	•				•		•
solid				•	•	•	•	•		•	•		
pattern			•		•		•			•	•	•	
gradient			•			•	•			•	•		
horizontal			•			•	•	•		•	•		
vertical			•			•	•			•	•		
shape										•	•		
highlight							•			•	•		
dither			•		•	•	•	•		•	•		
text							•						
perspective						•	•	•		•			
Abort Operation		•		•	•	•	•		•	•	•		•

PROGRAMS	My Paint	Graphics Studio	Images	Spritz	Chroma Paint	DPaint	Express Paint	Graphics Workshop	Digi-Paint	Photon Paint	Deluxe PhotoLab	Macro Paint	Mega Paint
Right Button Draw						•				•	•		
Keep Aspect Ratio		•	•	•		•	•			•			

NOTES:

[1] Fill/boundary: Fill all colors until the selected color is reached.

[2] Fill/color: Fill all contiguous pixels of the selected color.

Table 5. Brush Tools

PROGRAMS	My Paint	Graphics Studio	Images	Spritz	Chroma Paint	DPaint	Express Paint	Graphics Workshop	Digi-Paint	Photon Paint	Deluxe PhotoLab	Macro Paint	Mega Paint
Types													
copy		•	•	•	•	•	•	•	•	•	•	•	•
cut-out		•			•	•	•		•	•	•		
rectangle		•	•	•	•	•	•	•	•	•	•	•	
freehand				•			•	•	•	•	•		•
polygon						•			•	•			•
built-in	•	•	•	•	•	•	•	•	•	•	•	•	
patterns		•	•		•		•						
matte		•		•		•	•	•	•	•	•		•
ASCII							•						
Resize													
freehand		•	•	•	•	•	•		•	•	•		•
keep aspect ratio						•	•			•			•
smooth						•	•		•		•		
half						•	•			•		•	
double						•	•			•		•	
Rotate													
fixed		•				•	•	•	•	•	•	•	
freehand				•		•	•	•		•	•		•
slant/shear						•		•					
flip x/y		•	•	•	•	•	•	•	•	•	•	•	•
Multiple Brushes[1]				r		r	c	r	2				
Reposition Handle						•	•	•			•		
Remap Colors				•		•			•	•	•		
Transparency		•	•	•	•	•	•	•	•	•	•	•	•
Wrap													
2-D						•		•	•	•	•		
3-D[2]										•			
Bend						•				•			
Twist										•			
Spacing					•	•							
Restore Brush		•		•		•			•	•	•		
Shadows		•						•					
Perspective						•	•	•		•			

NOTES:

[1] Multiple Brushes: Includes ANIMbrushes.

[2] Wrap/3-D: Built-in 3-D objects.

Table 6. Drawing Modes

PROGRAMS	My Paint	Graphics Studio	Images	Spritz	Chroma Paint	DPaint	Express Paint	Graphics Workshop	Digi-Paint	Photon Paint	Deluxe PhotoLab	Macro Paint	Mega Paint
Color	•	•	•	•	•	•	•	•	•	•	•	•	•
Replace		•				•		•			•		
Smear			•			•	•	•					
Smooth					•	•	•		•		•	•	•
Antialias			•			•	•	•	•	•	•		
Blend			•			•	•		•	•	•		•
Cycle Draw	•	•	•			•		•		•			
Boolean													
AND/Colorize							•	•	•	•	•		
tint/luminance						•	•	•		•		•	•
SUB/ADD (shade)					•	•	•	•	•	•	•	•	•
MAX/MIN									•	•	•		
OR									•	•	•		
XOR									•	•	•		
mix							•		•		•		•
Pantograph			•				•			•			
Monochrome								•			•	•	•
Pattern		•			•								
edit					•								
Draw Thru[1]								•	•	•			

Notes:

[1] Draw Thru: Add the area from the spare screen beneath the brush to the current picture.

HAM Redux

WAITING IN THE wings is Aegis/Oxxi's SpectraColor. As a direct descendant of MicroIllusion's Photon Paint, it appears to be a thorough overhaul of that venerable paint program, adding such new features as ANIMbrushes, tweening, and brush paths across animation cels. Nevertheless, the Photon family resemblance was unmistakable in the prerelease version I saw.

ANIMbrushes are certainly the most welcome new feature to be found in SpectraColor. With this tool, artists can create composite animations using both background and brush cels. Although you cannot use the new tweening feature to automate authentic key-frame animation (the first and last frames must be from the same brush), all of the brush effects are active across all of the ANIMbrush's frames—making it indeed a powerful new tool. On-screen definition of brush paths is another useful innovation. Simply click the tool's icon and draw your path directly on the screen.

It apppears that a great deal of programming effort went into the new, improved animation mode; and ANIM playback control is much better. Unfortunately, ANIM creation and manipulation need further work. ANIMs are still assembled manually, frame-by-tedious-frame. Although the animation playback speed of uncompressed frames is impressive, I would like a compressed (ANIM) mode, too. In addition, perhaps the programmers might throw in real-time speed control before the final release.

Ultimately, SpectraColor is going to be more powerful than its predecessor, Photon Paint; the fact that it is building on the solid foundation of the earlier program is certainly an advantage. □

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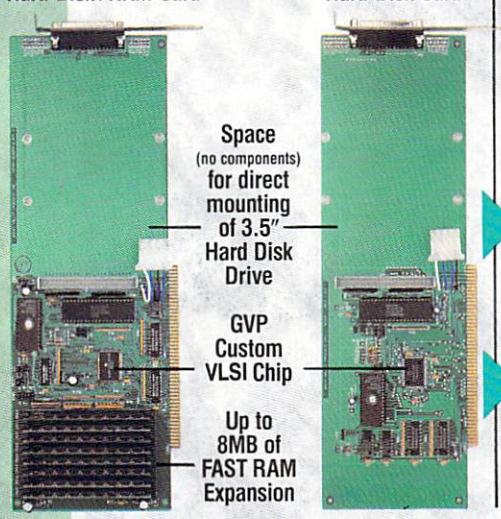

GVP's New *FAAASTROM* SCSI driver and installation software is also available as an upgrade kit for GVP's original IMPACT SCSI controllers, for ONLY $49.95. Offers major performance increase over previous GVP AUTOBOOT EPROMs.

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SCSI TIMES 1990

The ULTIMATE Trade-Up Offer???

GVP today introduced its new Series II product line and announced a bold new trade-up program, which is certain to further bolster GVP's dominant market share in the Amiga hard drive market.

Details of GVP's new TRADE-UP program are as follows:

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- All trade-in controllers must be sent to GVP FREIGHT PREPAID.
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Dealers Circle 145 on Reader Service Card

Consumers Circle 62 on Reader Service Card

Table 7. Palette

PROGRAMS	My Paint	Graphics Studio	Images	Spritz	Chroma Paint	DPaint	Express Paint	Graphics Workshop	Digi-Paint	Photon Paint	Deluxe PhotoLab	Macro Paint	Mega Paint
Max Colors	12	32	32	64	64	64	64	64	4096	4096	4096	16m	16m
Multiple Palettes	8			6						•	•		5
Copy		•	•	•	•	•	•	•	•	•	•	•	•
Swap		•				•		•		•	•	•	•
Spread													
rgb[1]		•	•	•	•	•	•	•	•	•	•	•	
hsv[2]				•						•	•		
Adjust Color													
rgb[1]		•	•	•	•	•	•	•	•	•	•	•	•
hsv[2]				•		•		•		•	•	•	•
Color Cycle	•	•	•	•	•	•	•	•					
number of ranges	1	32	4	6	1	6	6	6					
Efx Range						•		•	•				
Use brush						•		•			•		
Restore Last Palette		•				•				•			
Pick From Screen			•	•	•	•	•		•	•	•	•	•
Match/Remap	•			•		•			•	•		•	
Default Set					•	•	•	•	•	•	•		
Undo Changes		•		•	•	•	•	•	•		•		

NOTES:

[1] rgb: red, green, and blue.

[2] hsv: hue, saturation, and value.

Table 8. Print Options

PROGRAMS	My Paint	Graphics Studio	Images	Spritz	Chroma Paint	DPaint	Express Paint	Graphics Workshop	Digi-Paint	Photon Paint	Deluxe PhotoLab	Macro Paint	Mega Paint
Use Preferences	•	•						•	•	•		•	
Aspect Ratio				•		•	•				•		
Color					•	•				•	•		
PostScript							•						
Page					•	•					•		
Brush				•	•		•				•		

From p. 29

ping, I must confess I have never been comfortable with the other major contender, **Photon Paint 2.0** (MicroIllusions). The poor implementation of animation features and the absence of ANIMbrush tools frustrate this ambitious effort.

A new version of the program, however, to be called **SpectraColor**, is being ramped up by another group, Oxxi/Aegis, for release in 1991. (See the sidebar "HAM Redux" for a look at a prerelease version.)

Best New Program

I was impressed by the care and consideration lavished on The Graphics Workshop. Patterned

Continued on p. 40

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Combine the raw power of your Amiga with the utility of a modem and the indispensable convenience of a fax machine - and you've got a DataLink Send-Fax™ modem from Applied Engineering.

Send faxes directly from your Amiga's screen* without ever printing a "hard copy" of the information. The exclusive AE Send-Fax™ software installs itself as a printer option in "Preferences". Faxes can then be sent as simply as printing. Or even easier with our programmable "Hot Key". Go back to what you were doing, while AE Send-Fax operates in the background, or watch progress in an unobtrusive window. You'll automatically receive a report when the fax is completed.

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Table 9. Animation

PROGRAMS	My Paint	Graphics Studio	Images	Spritz	Chroma Paint	DPaint	Express Paint	Graphics Workshop	Digi-Paint	Photon Paint	Deluxe PhotoLab	Macro Paint	Mega Paint
Method													
page flip						•		•		•			
ANIM						•		•					
Set Rate						•		•		•			
interactive						•		•		•			
Save Range of Frames						•				•			
Playback													
step fwd/rvs						•		•		•			
goto frame						•				•			
reverse						•		•		•			
ping-pong[1]						•		•					
play range						•				•			
ANIMbrushes						•							
Frames													
append						•		•		•			
insert										•			
delete						•		•		•			
range						•		•					
new						•		•					
range						•		•					
copy						•		•		•			
swap								•		•			
merge								•		•			
Set Brush Path						•		•					

NOTES:

[1] Playback/ping-pong: Play forward, then backward. May repeat.

Table 10. File Formats.

PROGRAMS	My Paint	Graphics Studio	Images	Spritz	Chroma Paint	DPaint	Express Paint	Graphics Workshop	Digi-Paint	Photon Paint	Deluxe PhotoLab	Macro Paint	Mega Paint
IFF													
ILBM	•	•	•	•	•	•	•	•	•	•	•	•	•
ANIM						•		•		•			
ANIMbrush						•		•					
brush			•	•	•	•	•	•	•	•	•		•
RGB												•	•
Icon Files				•			•						
PostScript							•						
Alien Formats													•
Palettes			•	•			•				•		
Load/Save at X/Y											•		

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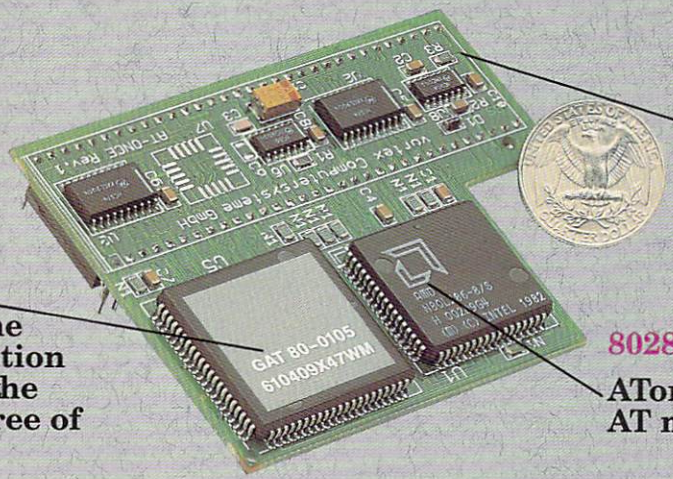

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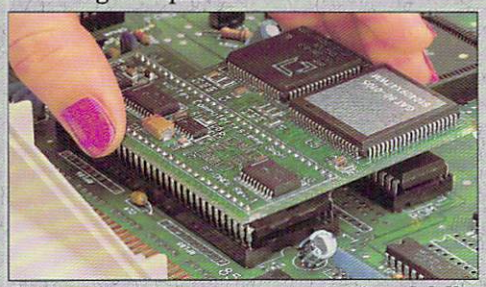

Fitting is a 10 minute operation* and full installation instructions are included in the user manual. Each ATonce is supplied with a high quality low power Motorola 68000 CPU, saving you time with the installation, providing a high degree of realibility and leaving you your original as a spare! ATonce does not affect the normal operation of your Amiga and is totally transparent when not in use.

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Table 11. Effects

PROGRAMS	My Paint	Graphics Studio	Images	Spritz	Chroma Paint	DPaint	Express Paint	Graphics Workshop	Digi-Paint	Photon Paint	Deluxe PhotoLab	Macro Paint	Mega Paint
Mirror/Symmetry	•	•	•		•	•	•					•	
Outline		•			•	•		•			•		
Trim						•							
Stencil													
color		•	•			•		•				•	
area													
rectangle						•	•	•		•			
freehand						•	•						
background						•		•		•			
foreground						•							
Magnify													
levels		3	1	2	1	22	1	3	1	23	50	1	1
resize window			•					•	•	•			
visible main screen		•	•	•		•		•	•	•	•		
scroll				•		•	•		•	•	•	•	
all tools functional			•			•			•	•	•		
Grid[1]		•	•			•		•		•		•	•
Flip Screen x/y						•						•	
Undo Levels	1	1	1	r	1	1	r	1	1	1	1		1
Keep Aspect Ratio			•			•	•			•			
Repeat Last Action		•							•		•		
Repeat Last Menu						•					•		
Mosaic				•						•	•		
Tiles			•			•			•		•		•
ARexx Interface									•			•	

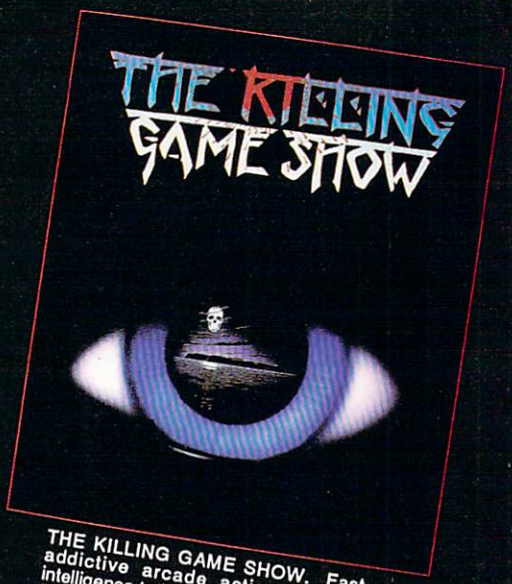
NOTES:

[1] Grid: Invisible

Table 12. Text Handling

PROGRAMS	My Paint	Graphics Studio	Images	Spritz	Chroma Paint	DPaint	Express Paint	Graphics Workshop	Digi-Paint	Photon Paint	Deluxe PhotoLab	Macro Paint	Mega Paint
Method													
on-screen			•			•		•		•	•		
type & place		•		•	•		•		•			•	
from file							•						
Any Directory						•			•	•	•	•	
Smoothing									•				
Shadows										•			
Edit		•		•	•	•	•	•	•	•	•	•	
Formatting							•						
ColorFonts				•		•	•			•		•	

SHADOW OF THE BEAST II. Stunning graphics, complex game play and an original musical score and sound effects combine to make this a superb sequel to Shadow of the Beast. Awarded "GAME OF THE YEAR 1990" INFO MAGAZINE



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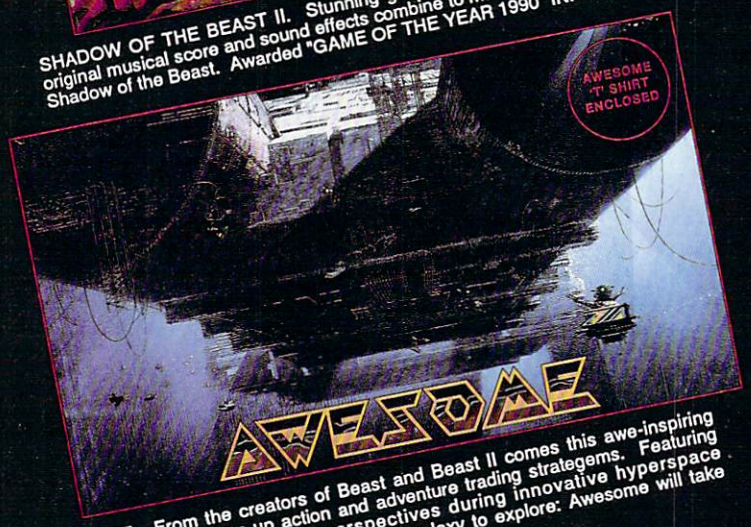

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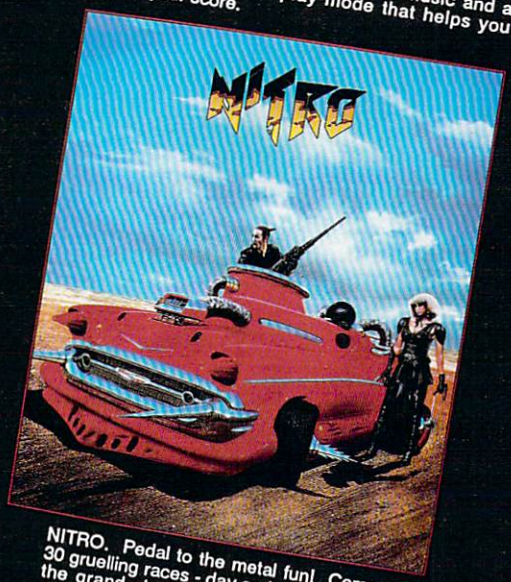
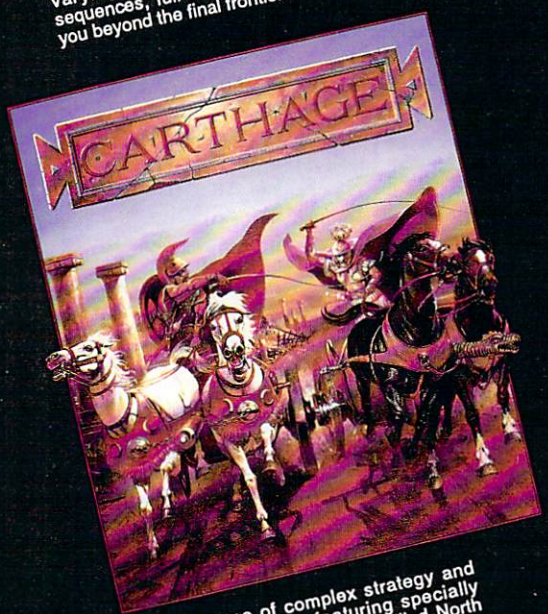


NITRO. Pedal to the metal fun! Compete in over 30 gruelling races - day and night earning points for the grand championship. Speed through cities, deserts, forests and wastelands. Pop in to the shop to modify and soup up your machine. Race against the computer or against two other competitors.



CARTHAGE. A game of complex strategy and breath taking arcade action featuring specially designed 3D graphics. Survey the detailed North African landscape and zoom in to deploy your troops. Decide which of your armies needs a cash injection then grab the reins for a mind boggling chariot race to deliver the money. Carthage will give you a taste of history so real you can almost smell the elephants.

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S E E I N G I S B E L I E V I N G

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closely on DeluxePaint, the software accommodates cel animation and as many as ten ANIMbrushes, all moving on the same screen. Simply set the paths of the brushes with DPaint-like Move requesters and then select Render to see the results. An improved palette tool and a comprehensive set of color-transformation functions round out this powerful package. I will use it for many of my future projects. ■

Gene Brawn is a digital animator, graphics designer and frequent lecturer, as well as a contributing editor to AmigaWorld. *Write to him c/o* AmigaWorld, *Editorial Dept., 80 Elm St., Peterborough, NH 03458.*

Manufacturers' Addresses

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AMIGA PROFILE

Behind the Portrait

READERS OF LAST month's issue may have been wondering who the "Artist" was in the opening of our "Portrait" article (see "A Portrait of the Artist as a Small Business," p. 54, Dec. '90). Well, here's another chance (inset)—which may cause some of of you to recognize award-winning Amiga artist Sandra Filippucci.

We certainly didn't have to sweet-talk Sandra on the virtues of the Amiga in order to get her to pose for the photo. She's sold on it—and has been for five years. Even when she struggled with it at first, she was always excited by the Amiga and driven by its possibilities.

When Commodore "discovered" her, the company jumped in with product support and technical assistance. She now does the

majority of her artwork on the Amiga. Currently, she is segueing from illustration work to large-scale archival corporate installations, for which she produces works in sizes up to 10×14 feet. Among Sandra's most recent accomplishments is the fact that an international jury of experts placed her entry among the 15 best works in the computer-graphics category (which had 738 entries from 24 countries) in the Prix Ars Electronica '90 competition in Linz, Austria.

Sandra's success keeps her busy; her calendar is booked up sometimes a year in advance. She is now, for example, gearing up for a one-person show at the Museum of American Illustration in New York City that will run October 2–November 1, 1991. Commodore is underwriting the cost for the poster to promote this exhibit. It's no wonder; not only is all her hardcopy work produced with an A2500/30, but an Amiga will be set up at the show to run animations that Sandra is creating now. Between now and then, she will be showing her work at California's first—and so far only—computer-graphics gallery, the Verbum Gallery in San Diego. That show runs January 1–March 8, 1991.

Although Sandra uses the ProWrite word-processing program for business communications, she—like the intended reader of the "Portrait" article—hadn't really considered using her Amiga for the business side of her creative enterprise. While she may be lucky enough to have outside assistance in looking after her far-flung financial interests, Sandra is beginning to see how her Amiga can help her out directly. In fact, she plans to start doing her taxes on the Amiga—when she can find a few spare moments!

—Barbara Gefvert

The Portrait "Process"

Image processing is a powerful tool that can add significantly to your repertoire of graphics techniques—as this portrait tutorial will show.

By Joel Hagen

ALTHOUGH MANY AMIGA users have a keen interest in computer graphics, some lack the rendering skills to paint satisfying images. For artists and non-artists alike, experimenting with image processing can yield dramatic color portraits even from black-and-white digitized photographs. Your results can stand alone, or you can use them as starting points for further work within any paint program.

The primary tool for all operations described in this article is PIXmate ($49.95, Progressive Peripherals). I am surprised by the number of Amiga artists who own PIXmate but use it only for converting HAM images to 32-color mode or for resizing an image. While most are aware of its image-processing and color options, few have really explored them as tools in their artwork.

Image processing is an outgrowth of imaging methods developed in the fields of space exploration and medicine, where enhancement of certain details aids in the interpretation of data. A variety of computational operations is performed on an image, pixel by pixel, based on the value of the individual pixel and its neighbors and on the constraints of the particular algorithm used.

Typical operations might enhance edges, boost contrast, increase sharpness, or blur or merge images. The computer artist can effectively employ all of these operations based on esthetic decisions alone. Thousands of combinations of processes are possible with a program like PIXmate. For our purposes here, I will concentrate on a few concepts that may be used as foundations for further experimentation.

Keeping It Simple

I began the series of image-processed portraits shown here with a 320×200 digitized black-and-white photograph of a friend, Jaida (Figure 1), who is a San Francisco Bay Area writer and traveler. Because of the focus of this article, I determined to rely as much as possible on the image processor alone to alter, color, and finish the portraits. My loose goals were to produce color portraits that departed significantly from the look of the original photo and brought out ►

something of the personality of the subject. I chose to seek processing sequences that approximated computationally some of the creative choices I might have made with paint.

To ensure that all of PIXmate's operations worked effectively, I first sorted the palette, low to high, under the Color menu. To increase detail at subsequent stages, I reformatted the image to 320×400, the maximum nonoverscan HAM resolution. I intended much of my final work to be in HAM for the sake of achieving increased subtleties of color variation.

I began by breaking up the highly dithered photo into more simplified value shapes. With the c key, I copied the image to a spare screen, allowing me to make the original image available for comparison with any processed versions that I might later have on my current screen. Using the f key, I was able subsequently to flip back and forth between screens.

Figure 1. A digitized black-and-white photo of the subject before any image-processing techniques are applied.

With the i key, I then brought up the image-processing tools. During the early stages, I left the logic controls set to NOP (no operation).

My first move was to soften the image using AVG, the averaging-pixel process. PIXmate focuses on a three-by-three matrix around each pixel and totals the values of those nine pixels. Dividing by nine yields an average value that replaces the value of the center pixel. The process is then repeated for every pixel throughout the entire image. The result is a softened version of the original, with the dithering reduced or eliminated.

I wanted the image to be even more broken up into large value shapes, so I selected MF2, a median filter-pixel process. In this operation, the program samples a five-by-five matrix and replaces the value of the center pixel with the median value of the 25 pixels. The effect is similar to averaging, but tends to preserve detail better.

When the operation was finished, I closed the Image tool box by pressing the Return key in order to view the results. With the u key (the Undo function), I could toggle back and forth between the averaged image and the average-plus-median version. In addition, with the f key I was able to toggle back and forth between either version and the original on the spare screen. (PIXmate's Undo is one of the most useful I have seen—I can even save an image between undos.) I now had three potential versions of the image instantly available at a keystroke.

I liked the look of the picture broken up into simple value shapes (Figure 2, left). To color it, I avoided the built-in "pseudo" color option in the menu—which offers little opportunity for variation and is more suited to technical, not creative, work—and instead brought up the palette control with the p key. I raised the Blue slider on the darkest hue a few notches to give it some color. Moving up four or five colors, I altered the RGB sliders of the gray value to produce another color.

To preserve the approximate value of the color position, leave one slider in place as a marker, move one of the remaining sliders up a notch or two and the other down a notch or two. In this fashion, you can create a color every four or five positions up the palette and then use Spread to create the intermediates between each set of extremes. The resulting 16-color image (Figure 2, right) is an example of a quick process producing a finished portrait. It will also load into any paint program for further work.

Operation Merger

For my next experiment, I used the menu's Merge RGB to HAM feature with three separate images to produce a final color composite. For the first, I performed a simple red extraction of the original photo and saved it (Figure 3, left). All extraction choices are available under the Color menu.

For the second image, I used the gray-scale, average/median version of the previous portrait, with some of the dark values cut out. I accomplished this with the image-processing tools by using THR, the threshold-pixel process, with Threshold set at 8. Performing a green extraction of this image. I took it into DeluxePaint ($149.95, Electronic Arts) for touch-up, removing the eye detail and filling some areas before the final save as a 16-color image (Figure 3, center).For the remaining blue image, I again took the average/median gray version, but performed an EDG matrix operation on it. This is a Sobel edge-detection process that leaves only outlines of shapes. I used the * kernal, which leaves the strongest outlines, responding to linearities in any direction. The process leaves light lines on a dark background. To reverse this, I set the Logic operation, EOR (exclusive-or), and clicked the Logic gadget. Doing this causes a modified exclusive-or operation to produce a negative image. By performing a blue extraction ►

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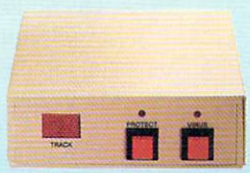

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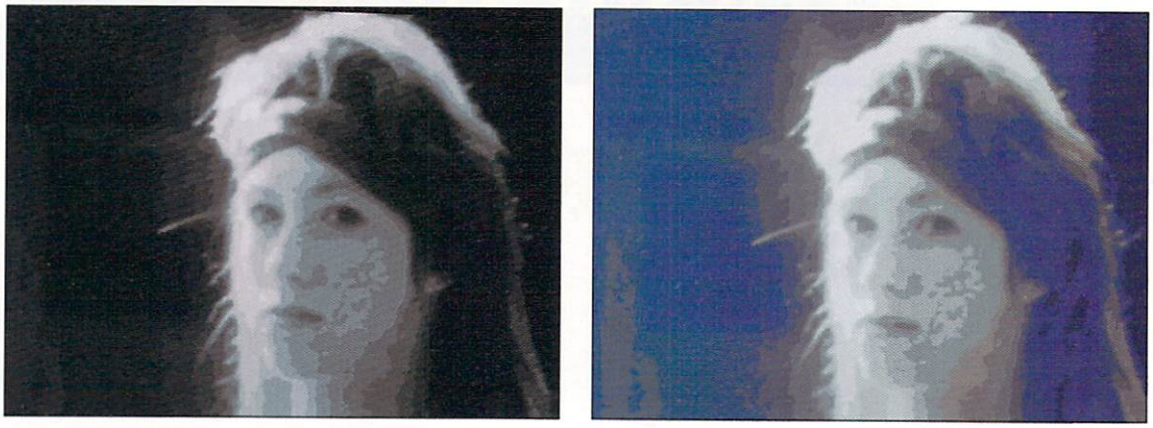

Figure 2. After breaking up the photo into more simplified value shapes (left), it can be quickly turned into a 16-color image (right).

of this, I got the final image—dark outlines on blue (Figure 3, right)—for my merge.

After loading the red image, I selected Merge RGB to HAM from the menu and was prompted to load the next two images. PIXmate then produced the composite image shown in Figure 4. The light eyes in the portrait worked pretty much as I had anticipated. Had I not removed the eyes from the green plane with the paint program, they would have appeared quite dark in the final merge. I like the look of this portrait. The outlines add a strong graphic element to the composition. I also feel that the light eyes convey something of Jaida's character. In a portrait, that should certainly be part of the goal.

On to New Experiments

The outlines intrigued me so much that I could not avoid a quick side experiment to turn it into a "paint-by-number" piece. I used EOR and the Logic gadget to negate the HAM image, thus producing vibrant colors. I reduced that image to 32 colors and saved it. Wanting black outlines to finish the image, I took the blue-line image I already had, selected LAP (the Laplace operation, which emphasizes edges), and used the * kernal to emphasize the dark lines. I then proceeded to set Threshold to 4 and performed a binary operation, BIN, which produced a high-contrast, two-color (black-on-white) image of lines.

Using DPaint, I loaded the 32-color portrait to one screen and the lines to the other. I then brought back the color with Restore Palette. I picked up the lines as a full-screen brush, pressed the j key to flip to the other screen, and placed them on the image. While I found the result to be fun and colorful, it was a little difficult to recognize the person, and I decided to scrap that image from the series of illustrations presented here.

I returned to the previous picture for ideas on how to bring more character to the portrait. I liked the way the simplified green plane emphasized the light direction on the subject, so I decided to play that for a more dramatic effect. Returning to the gray average-plus-median image, I made a slight adjustment to the threshold slider and again used the binary operation, BIN. The result was a clean, bright shape of the highlights against a black background. This became my green image.

The red image was more complex. Using the method described earlier, I created a merged composite by combining one plane of the processed photo with two planes of a HAM abstract painting I had already completed (and which, in fact, is the illustration accompanying this month's "Accent on Graphics"—see p. 60 for more on how it was created). I ►

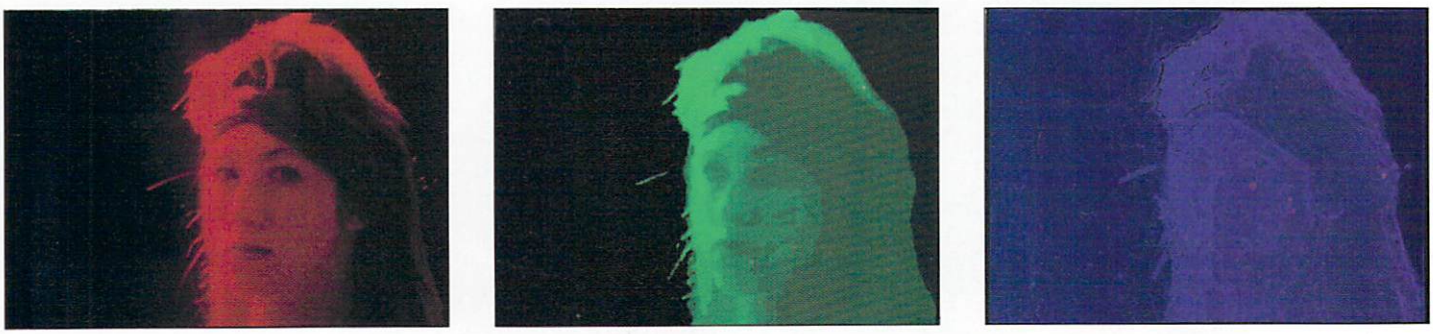

Figure 3. Three separate images (red, left; green, center; blue, right) are manipulated, each by a different processing technique, to prepare for the color-composite image.

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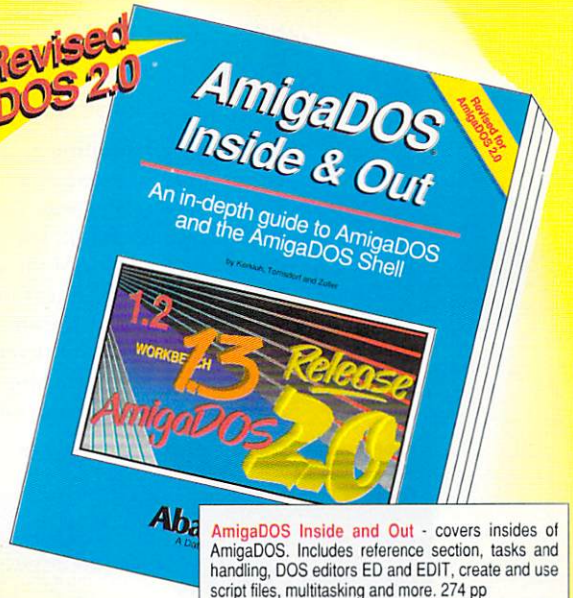

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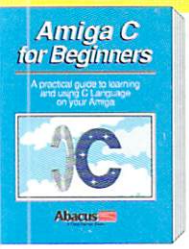

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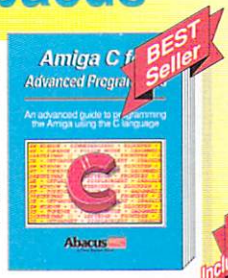

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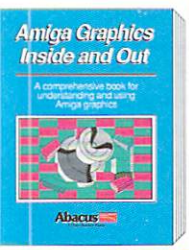

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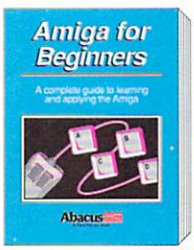

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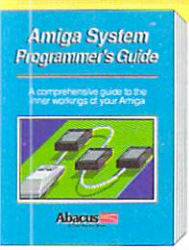

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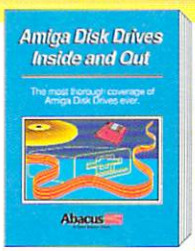

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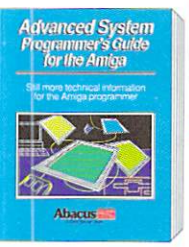

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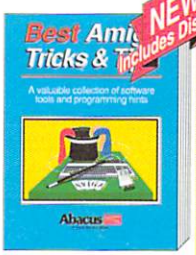

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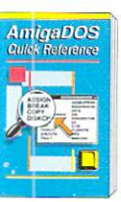

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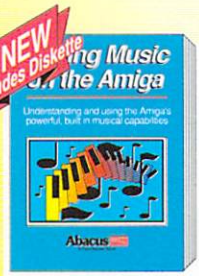

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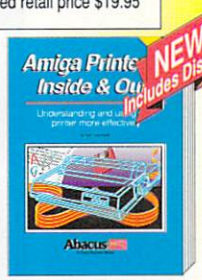

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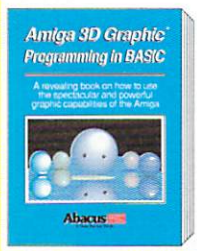

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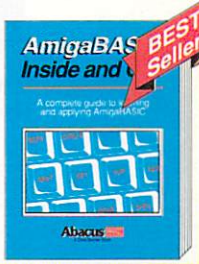

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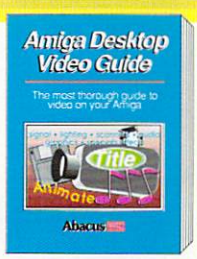

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reduced the resulting composite from HAM to 32 colors and did a red extraction.

The blue image was simply an extraction of the original photo for detail. I then merged all three images into one HAM image for the final portrait in the series (see the illustration on the opening page of the article). I like the abstract elements composited with the photographic detail. The serendipity of some of the light lines crossing the face was a fortunate surprise. The high-contrast green plane worked as I imagined, creating a strong sense of light and again conveying character appropriate to the subject and her martial-arts background.

Figure 4. Through its Merge RGB to HAM feature, PIXmate produced this color-composite image of the subject.

And That's Only the Beginning!

My experiments represent only a very few of the many directions you can take with the image processor in working on a portrait. I find that photographs with a strongly defined light direction work best. Clearly defined areas of light and shadow create drama when they are emphasized.

As a painter, I find it revealing to explore the kind of image simplification outlined in the beginning of this article. The shapes of shadow and highlight areas on a face or figure are easier to see when they are averaged or emphasized by a median-filter operation. The process may prove instructive to anyone exploring portraiture and life drawing. The shape of light and shadow can be further emphasized by reducing the number of colors to eight, four, or two values. Then you can decide which value levels convey significant information to the eye and which can be eliminated or simplified.

In compositing red, green, and blue images, DeluxePaint is the handiest tool for manual touch-up and image alteration, as the images need to be nonHAM for merging. Also, the program lends itself to simplified color schemes and to high-resolution output at 640 × 400 pixels. For other kinds of "painterly" effects—such as transparency, subtle ranges of color, image "rub-through," and warping—I have found Digi-Paint 3 ($99.95, NewTek) to be a powerful and easy-to-use program. I also use Photon Paint ($149, MicroIllusions) and Deluxe PhotoLab (now being bundled with DeluxeVideo III, $149.95, Electronic Arts). Each program has its strengths, and when they are used in concert, it is difficult to imagine an effect that cannot be achieved.

If hardcopy, not a screen image, is the final goal of your portrait work, there are a couple of tricks that may help you. Large photographic prints of the screen are very effective final formats for portraits. If you shoot the photo of the screen yourself, you should experiment with unfocusing the lens a bit to infuse a slight blur into the pixels. Always work with an interlaced image for increased detail and to avoid black scan lines.

If you want a color printout, the HP PaintJet does a good job for a reasonable price. Otherwise, I recommend the "Posters" program within Deluxe PhotoLab for basic printout. Using Posters, you can produce large, tiled images. Posters even has an excellent smoothing option for eliminating the blown-up-pixel look from the final tiled print. Although using this feature means it will take a long time to process the image, the results are often well worth the wait.

While image-processing may not actually make you a better painter per se, it certainly can help you produce better paintings and portraits. ■

Joel Hagen's credits include work in art, astronomy, science fiction, and software development. He is also Amiga-World's *"Accent on Graphics" columnist. Write to him at 10512 Sawyer, Oakdale, CA 95361. Please include a SASE for reply.*

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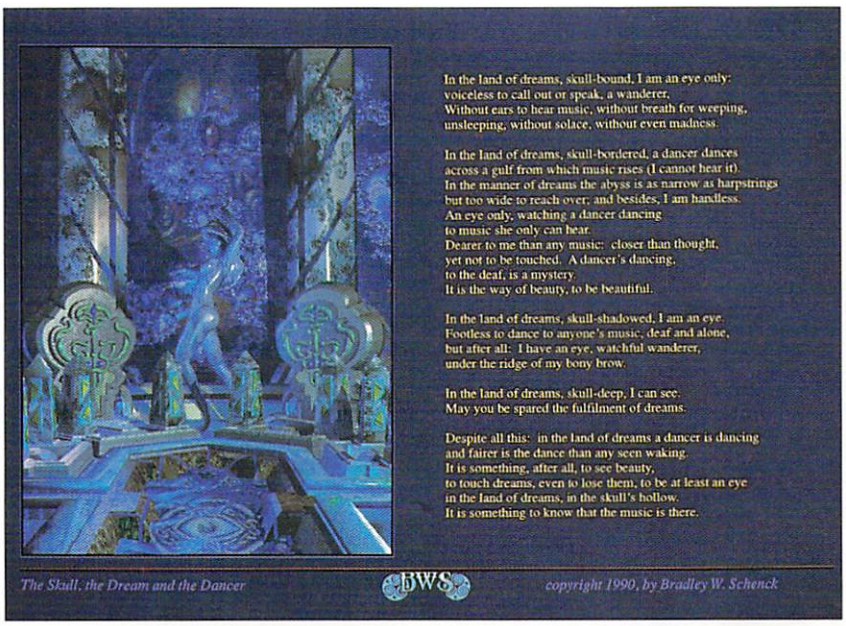
Slide into Print

Making slides from your screen images and then color-separating them may well be the key to achieving better-quality printed output.

By Bradley W. Schenck

WITH ALL THE exciting developments in Amiga video production, it's easy to forget that there's more to life—and to computer graphics—than NTSC video. As seductive as rotating reflective teapots and flying logos are, you need not look far to see that the world still turns on paper. Magazines, newspapers, and advertising brochures have not given way to a paperless society. As an artist first and a computer artist second, you want your work to be viewed and shared by as wide an audience as possible.

In many cases, you can apply the same tools used in real-time animation and video work to the print medium. Printing can make full use of 24-bit color and very high resolution, and, as a bonus, images for print do not suffer the degradation inherent in conversion to video. Also, because printed images are not limited to screen size as are video and Amiga-displayed pictures, you can create very large bitmapped graphics to achieve higher resolution in the final output.



I take my work to print through slides made by a film recorder. A slide can reproduce computer art in very high resolutions, and from it, you can send the work virtually anywhere. As an example, I will show you how I combined a large, ray-traced bitmapped image with structured graphics and text. Hammond Photographic Services prepared a slide of this work using Professional Page ($395, Gold Disk) through color PostScript at 4000 lines of resolution. From there, I had traditional color separations made for process printing. (The opening illustration for this article is produced from this slide.)

Although traditional color separation is more expensive to produce, I rely on it because digital color separation does not measure up. Still, you can use the techniques outlined here to produce digital separations for very affordable process color printing.

How To Get the Big Picture

I created a very large image for this project using Turbo Silver SV ($199.95, Impulse). Silver limits its output to standard Amiga screen sizes, including overscan, so I chose a hi-res overscanned format (704 × 480) in 24-bit color for rendering. I could have ►

rendered the image in 12-bit color (Professional Page 1.3 does not support the IFF 24-bit image format), but I found that my processed image benefitted from its 24-bit origins. Also, while you can use this process for 2-D graphics, very large screen sizes (with which we can take greatest advantage of the high-resolution film recorders) are best suited to 3-D applications. Generating a large image is easier than painting on such a large scale.

I conceived this image as an illustration for a poem that describes the artistic experience as a sort of waking dream state that is more vital and inherently true than the works it inspires. I wanted the picture to echo the dream imagery in the text and evoke a sensation of its symbolic power.

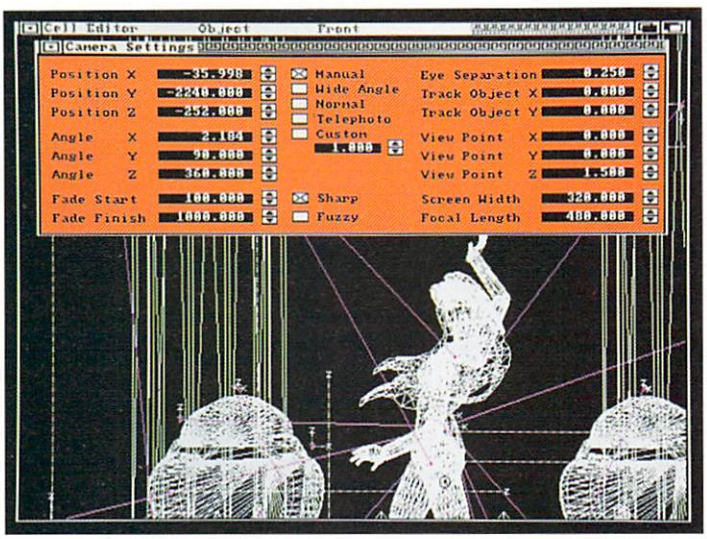


Figure 1. The image in progress in Turbo Silver. Note that the Angle Y setting in the Camera panel is at +90; this rotates the camera 90 degrees. It would have been simpler in the long run to set it at −90.

Figure 2. The rendered image, converted to a large interlaced HAM picture, has now been moved into Deluxe PhotoLab for retouching. This is as much of the large HAM picture as fits on a single screen.

I worked from a thumbnail sketch of my idea, using Silver's Object Editor to build the elements of the scene. I used several of Silver's volumetric textures and a number of IFF image wraps to achieve the rich, mythic atmosphere.

Because I wanted the final image to have a vertical aspect (that is, a height greater than its width), I rotated Silver's camera by 90 degrees. This meant that the image would be rendered sideways (see the Angle Y value in the Camera Settings panel in Figure 1). Had I been clever enough to rotate the camera in the opposite direction, I could have avoided flipping the image once I had rotated it. While working on the picture, I rendered it in interlaced HAM so I would be able to see the entire image on screen.

Having laid out the scene to my liking, I rendered the final tests in high resolution with 24-bit color. I used The Art Department ($89.95, ASDG) to translate these 768×480 images to HAM screens that were so large (roughly four normal HAM screens in size) that I had to scroll around to view them. At this magnitude, any HAM fringing or other effects are about half as visible as they ordinarily are. You must envision the picture reduced to single-screen size to appreciate how much crisper it is than a normal HAM image. Just imagine a high-resolution HAM screen (genuine HAM, not the rather limited Dynamic HiRes or ARes) with overscan: The pixels are the same size as normal hi-res pixels, but many more colors are present.

This particular image took about 11½ hours to ray trace on my seven-megabyte, 68030-based system, and it ate up almost all the memory in the process. (I have not often run out of memory at seven megabytes, but I figured out long ago that if I were not running out of RAM, I wasn't trying hard enough.)

Spin, Squash, Stretch, and Scale

Once the rendering was complete, I loaded the 24-bit, Impulse-format file into The Art Department (TAD). Before I did, however, I set TAD's Orientation button to Landscape, so that the ray-traced picture automatically rotated 270 degrees (or −90 degrees) as it loaded. I then used TAD's horizontal and vertical Flip buttons to complete a +90-degree rotation. (As mentioned before, I could have avoided flipping the image by rotating Silver's camera by −90 degrees instead of +90.)

At this point, TAD was handling the 24-bit, ray-traced image in a size of 480×768 pixels. That's because my overscanned original was 768×480 pixels before being rotated. If Amiga pixels were square, rotating the image this way would not change its aspect ratio. Its pixels are rectangular, however, so rotating a picture gives it a squashed appearance.

A square pixel has an aspect ratio of 1:1, that is, it is exactly as wide as it is tall. Amiga pixels, in both lo- and hi-res, have an aspect ratio of 1:1.16, meaning ►

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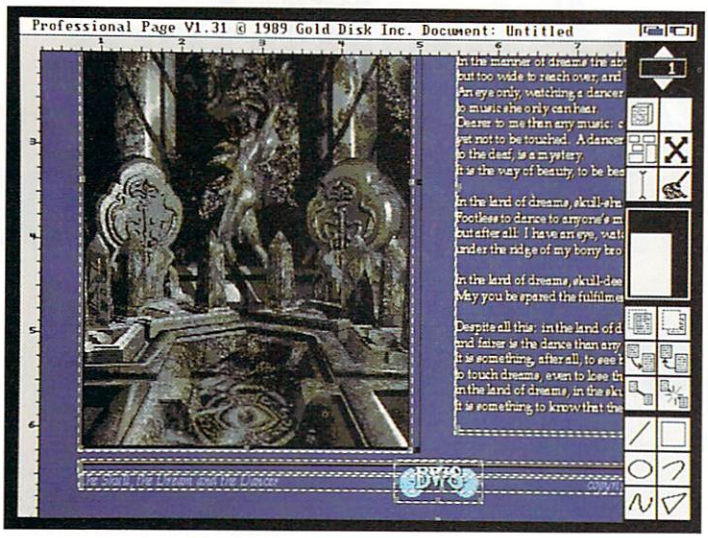

Figure 3. In the final stage before reproduction as a slide, the HAM picture is combined with structured text and graphics and placed against a solid color backdrop in Pro Page 1.3. The structured elements will render much more sharply than this screen shows.

that they are 1.16 times as tall as they are wide. In order to "unsquash" the picture, I needed to restore the 1:1.16 aspect ratio in my new image.

Because the image had been rotated, I had to rescale its width to 135 percent of its size (that's multiplying it by 1.16 twice; multiplying it by 1.16 just once would give it the aspect ratio of square pixels rather than our rectangular ones). TAD's scaling requester let me set the picture's width to the exact size I needed, and the result was a low-resolution screen 643 pixels wide and 768 pixels tall. I might have had TAD translate that to a lo-res HAM image, but I wasn't through yet.

Although TAD was dealing with the 24-bit data I had originally created, the display was in HAM, so some subtle shades in the image data did not show up on screen. Think of the image at this stage as a HAM picture, each pixel representing one pixel of a 24-bit image and using as close a match to the broader palette as HAM can provide.

I rescaled the image one more time, making it twice as tall as it had been, and requesting an interlaced HAM image instead of a low-resolution one. I also ►

Many Bits Make Better Pics

WHILE I WORKED on the experiments that led to this article, several important products were released or on the verge of release. Because they support the IFF 24-bit color format, you will be able to use them in combination with one another.

Advances in 3-D rendering software include Impulse's Imagine, Hash Enterprises' Animation:Journeyman, and NewTek's LightWave 3D.

Among new 24-bit and "near" 24-bit display hardware are Firecracker (Impulse), DCTV (Digital Creations), and the legendary Video Toaster (NewTek). Each of these display systems has different strengths and weaknesses.

Firecracker is a true 24-bit RGB display, with which you can bypass NTSC video altogether. Such an RGB display is the best option for taking 24-bit graphics to print, because it enables you to see the entire image without a conversion to video. The Firecracker itself is now shipping (its software supports 24-bit IFF), and Impulse promises a true 24-bit paint program (Light) to accompany Firecracker free of charge.

DCTV, an NTSC-only device, offers a very inexpensive display that *is* video. It cannot display your 24-bit graphics as accurately as the Firecracker, but its video images are very good. DCTV's display resolutions are similar to standard Amiga displays, but in about four million colors. Its real strength is that it can animate in real time at about the same speed as normal high-resolution, eight-color Amiga graphics. Digital Creations is also promising a paint program for DCTV, which will operate in NTSC but load and save IFF 24-bit files.

The Video Toaster, which is shipping in small quantities, also offers an NTSC display, and Toaster Paint, its accompanying paint program, supports the 24-bit IFF format. (For details, see "Amiga Video: Done to a 'T'," Oct. '90, p. 20.)

Each of these products is significant for the type of project this article addresses. As an example, Imagine allows you to render in any resolution you choose, so you can use it to create images that take full advantage of the film recorder's resolution.

Paint software supporting 24 bits lets you retouch these images without converting to HAM mode, while 24-bit or "near" 24-bit NTSC displays give you a good idea of what your image actually looks like. It is possible to manipulate a 24-bit image without such a display, but only by working blindly. The best alternative without such a display is to work in HAM up until the final rendering, but with this method you cannot retouch your work.

ASDG's The Art Department Professional, still in beta form at the time of writing, offers more image-processing alternatives, batch processing, and multiple save formats, and it promises direct access to the display systems mentioned above.

Finally, the just-released Professional Page 2.0 supports the 24-bit IFF picture format. This means that you can now use 24-bit files directly within Pro Page.

Put all that together, and it adds up to this: The process outlined in this article will soon—maybe even by the time you read this—be possible in every detail using 24 bits. Forget HAM's 4096 colors altogether. With these new products, you'll be able to render 24-bit graphics in any resolution, touch them up with 24-bit paint software, and then proceed to output them in their full 16.7 million colors. □

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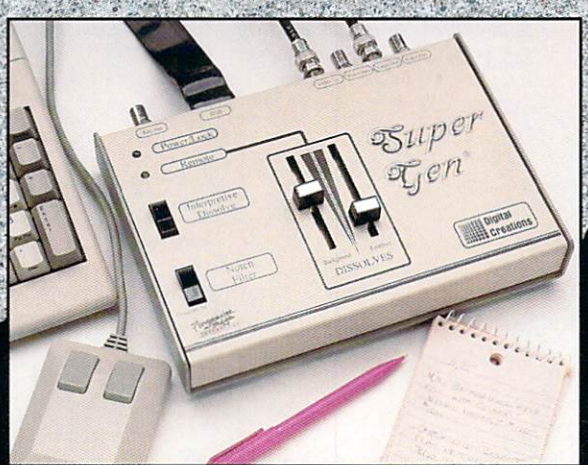

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selected Floyd-Steinberg dithering from TAD's Dithering Modes panel. TAD provided me with a new HAM conversion of the 24-bit image, which now had pixels half the size of the original 24-bit pixels and simulated—through dithering—the subtleties of color not available in the first HAM image. The resulting 643 × 1536-pixel HAM screen was the best approximation of the 24-bit image I could get.

I performed some final retouching of the image in Deluxe PhotoLab (now bundled with DeluxeVideo III, $149.95, Electronic Arts), which allows you to work on very large bitmaps. (Other HAM paint programs do this also, but I prefer PhotoLab for detail work, as opposed to broader, more painterly effects.

Slip-Sliding Away

The Professional Page document that would become my slide had to conform to certain specifications in order for Hammond Photographic Services to handle it. It had to be sized at $10^1/_2 \times 7$ inches; any structured text or graphic, in color, could be used just as in a printed document.

Using Pro Page 1.3 and Gold Disk's Compugraphic-fonts expansion disk, I imported my text from a word processor and formatted it in the Palacio font, which is equivalent to Postscript's Palatino. I duplicated the text box of the poem and changed its color to black. By dropping this cloned version of the text box behind the original, I created a drop shadow for the text.

The signature logo is a Professional Draw 2.0 ($295, Gold Disk) clip. I used a plain color backdrop and added the bitmapped HAM image and a double outline around it in color. Figure 3 shows a close-up of part of the document in Pro Page.

You might notice, in Figure 3, that the image looks a bit compressed horizontally. That's because Professional Page treats the screen as though the pixels were square, which is much easier for its calculations. As of version 1.3, however, Pro Page automatically scales bitmapped graphics correctly as they are brought in, so the squashing is an illusion.

After making some adjustments and printing some proofs in gray scale on my Hewlett-Packard Deskjet printer, I produced the final version of the slide and mailed it to Hammond Photographic Services to be output on the film recorder.

The Rest of the Story

When the mailman returns your finished slide from the service bureau, you may feel that you are at the end of the road. In fact, you are really only at the beginning. A 35mm slide or negative is a ticket to any form or size of reproduction for the image—be it an illustration, print, poster, T-shirt design, or what-have-you. Not only is the image now alive in the real world, but it is also sharper and better than the images you are used to seeing on your monitor. Moreover, it is an image that anyone, anywhere, can view.

We concentrate so much on the evolution of our imaging tools that it is easy to overlook the basic need of artists: to communicate. Not just with one another, or with people who have similar systems, but to the wide world beyond. The true usefulness of our tools can be measured not by how much we can do with them, but by the degree to which they make us better able to bring the works of our imagination out into that world. ■

Bradley Schenck is a freelance graphic artist who has won the Badge Killer Demo contest twice in a row. His 1989 winning entry, The Sentinel, was created in Turbo Silver. Write to Brad c/o AmigaWorld *Editorial, 80 Elm St., Peterborough, NH 03458*

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Comin' at You

Create 2-D artwork with a 3-D look without colored glasses or modeling programs.

By Brian Williams

WANT TO REPLACE your listless sketches with pictures that jump off the page at you? Lacking stereography's advantage of two discrete images, two-dimensional pictures, such as the engine below, must rely on subtle psychological tricks to fool the brain into perceiving depth. Don't reach for a copy of Freud or Jung; perspective, balance, shading, and color are the mind benders in art.

Before firing up DeluxePaint III ($149.95, Electronic Arts) or whatever your favorite paint program is, consider your subject carefully. I wanted my example image to project mass, dimension, and detail.

After entertaining several ideas, I settled on a railway train. A popular icon in American culture, the train is recognized for mass and volume. By incorporating it in the picture, I could draw on viewers' personal memories to reinforce the picture's message.

Next, I had to decide on the train's representation: Should it be rendered in an abstract, realistic, or stylized form? How should I depict it? Should it be a close-up detail or a wide view? Ultimately, I chose the front of an old steam engine ripping through a flat picture plane. The angle was dramatic, and the classic engine full of colorful detail.

Figure 1 shows the initial sketch. I used DPaint's line tool to determine each element's size. There are three areas of interest: the engine, the background pattern, and the text box in the lower-right corner to balance the large engine, which is oriented vertically to the left side of the screen. Notice that the latter does not intersect any of the picture's edges. Doing so would enhance the flatness of the image and undermine the three-dimensional effect. I also reserved enough room under the track so that no shadows would hit a screen edge.

Because I was designing the picture for the printed page, I chose absolute white (the lightest shade in the palette) for the background. If you are under no constraints, you can use other depth-enhancement techniques. A black background, for instance, would allow the train to project better than the light background. If the border of the picture were not fixed, you could run the track off the image a little way onto the printed page. ►

A background pattern provides tactile visual detail that, because the pattern is clearly oriented in a plane, defines the background as two-dimensional. A completely blank background does not. Be careful in your choice: Do not make the pattern so prominent that it inhibits the relief of the main image. I decided to repeat an elevation of the engine in a gray that's dark enough to be seen but light enough not to be distracting. Such a shade leaves no question in the viewer's mind as to the main focus of the piece. If you use a more complex background, try blurring it to subdue its impact.

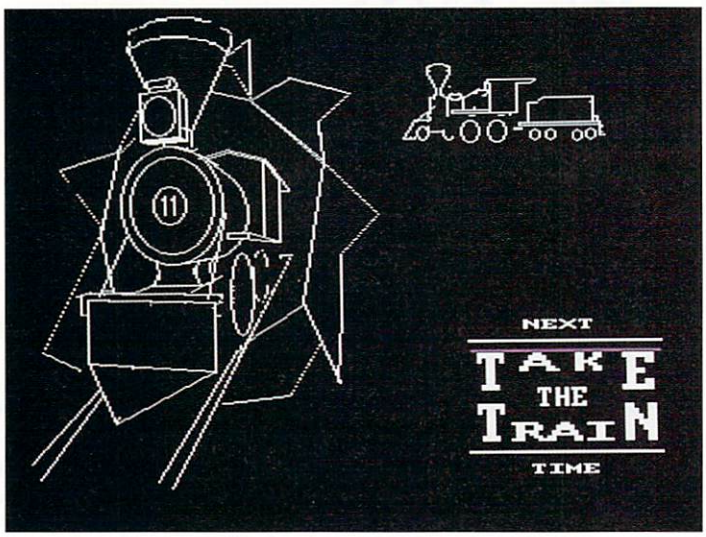

Figure 1. Before starting in earnest, sketch your picture's main elements to determine their relative sizes.

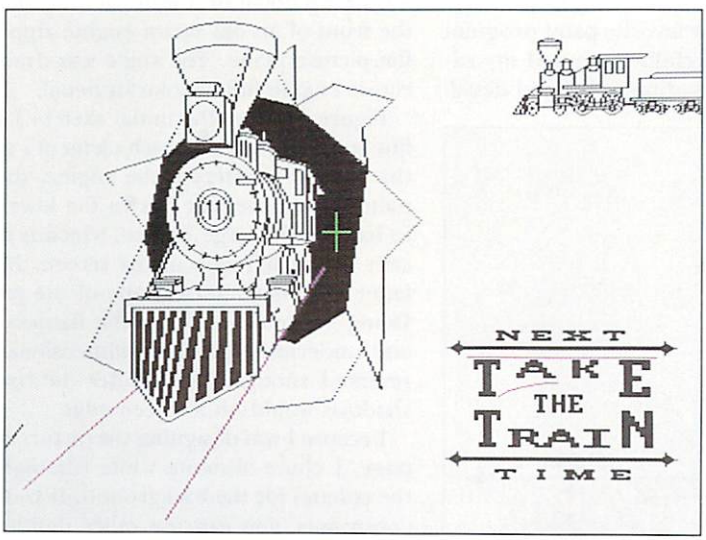

Figure 2. In the perspective layout, all receding parallel lines converge to the vanishing point (the green cross).

PERSPECTIVE: VANISHING VISIONS

In addition to helpful guidelines, perspective possesses exact rules, unlike most disciplines in art. The most important is that the farther away you wish objects to appear, the smaller they must be. This principle has several offshoots. Regularly spaced objects (such as telephone poles) must be drawn closer together—as well as smaller—as they recede into the distance; and sets of lines that are in reality parallel (yet not in the plane of the drawing) converge to points on a horizontal line in the distance. This line is called the horizon line and represents the physical horizon in the real world. I drew the engine using a subset of standard two-point perspective called one-point perspective. Under this rule, all receding parallel lines converge to a single point, known as the vanishing point, on the horizon, and vertical and horizontal lines are drawn actually parallel (the vanishing points in such cases being "at infinity").

If you need help, DeluxePaint III has a useful perspective tool for plotting brushes in three dimensions. To re-create the track, for example, draw an overhead view of a section of track in full detail, including the spikes and wood grain of the ties. Grab the image as a brush, and rotate it into position along the x and y axes using the perspective keypad controls. Enter activates perspective mode; 1, 2, and 3 control movement on the z axis, 4, 5, and 6 on the y axis, and 7, 8, and 9 on the x axis. The decimal resets the center, and the minus gives you a perspective fill. 0 resets all the axes.

The drawback is that after the computer plots the rotated view, you must add the rail and tie thicknesses manually. Because of these time-consuming touch-ups, I opted instead to draw the track for the example by hand. As I can draw fairly quickly, the perspective plot would not save much time.

Figure 2 shows the perspective layout for the train. Note the green cross that marks the vanishing point. Here, all receding lines converge: rails, tie ends, and running boards on the engine. The strictly two-dimensional background contrasts with the perspective train. The flat, gray engine in the upper-right corner of the screen has enough detail to serve its purpose. Later, when final layout is ready, I will repeat this image across the screen.

BALANCE: LEVELING THE SEE-SAW

Figure 3 shows the outline drawing filled with colors. At this stage, you should move the basic shapes and adjust the colors to create a visually balanced image for the final layout. While detail may not be present at this point, the visual weights of the colored areas will not change significantly, so you can position the various elements to avoid the characteristic lopsided feel of improperly balanced images. Here, the text in the lower-right corner helps to balance the engine, both horizontally and vertically. I find layout is a pleasure on the computer because I can reposition elements on screen with great ease and accuracy.

Because your main elements (in my case the engine,

and text) will balance differently on a blank background than on a pattern, you must repeat the background pattern before repositioning the main objects. DPaint's pattern-fill feature makes this easy. For example, grab the small gray engine as a brush and fill it into the blank area. You will have to experiment a bit to make the rows overlap vertically. It's even more difficult to ensure that each screen edge cuts through a row or column. Keep trying! Unlike the "three dimensional" engine that must not hit an edge, the "two-dimensional" background needs to touch the edges to appear flat.

Shading: A Matter of Degrees

An artist's best tool for achieving depth is good shading. Emulating the excesses and nuances of natural lighting in an image provides the brain with the most important visual-depth clues. Some people do not posses binocular vision; while their brains receive signals from two eyes, they do not process images as being three-dimensional. Such people can still live perfectly normal lives (minus the thrill of an occasional ViewMaster reel) because light and shadow, combined with relative size and parallax, provide depth to two-dimensional images.

In addition, most of that light and shadow is only gray-scale. Much of the world around us is made of mostly gray tones. Beiges, steel blues, and pale greens are not as saturated as film processors would lead you to believe. Human vision reflects this in the eye's retina. Rods, the cells that see only grays, outnumber cones, which see color. If anything in a picture has to be right, it is the shading.

Figure 4 shows the fully shaded image, minus the rips in the paper. The lighting is a fairly standard three-point scheme, simulating three lights: direct illumination from overhead left, ambient light on the right shadow side, and a backlight directly above the engine. The old adage "shoot with the light behind you," conceived to prevent amateur color photographers from becoming discouraged, does not produce the most flattering results.

The picture is a dark area; the train, on a light background, is basically black on white. Of the two extreme contrast possibilities, black on white and vice-versa, most people perceive white projecting forward on black more strongly than black on white. If a white background is a design constraint, as it is here, you can work around it. Depth cues from lighting in this image come from the careful use of shadows in and around the engine and ripped pieces of paper. On the computer, you can add with great precision subtle highlights and shadows that would take a photographer hours to achieve. (See "Illusions of Depth," p. 50, Jul. '90 for further advice.)

In general, the train gets darker as it recedes into the distance, eventually disappearing into the darkness. Note, however, the sudden drop off on the cab and on the ties below it. This represents more or less direct light "coming though" the ripped hole. The material each section represents also determines how you handle light and shadow. The boiler and stack are black, but I rendered them in grays to show highlights of detail. The cast-iron boiler has a rough surface, which I handled differently from the polished metal stack. The brass details and the glass in the headlamp and cab window are all reflective surfaces.

While the example picture does not have too many harsh shadows, you should consider your shadows carefully. Heavy, long shadows on any background can form a visual element that affects the balance of the image. Plan for shadows from the outset and use DPaint's shaded-drawing mode for the best effect.

First, draw the background in a set of sequential registers, such as a gray scale. Then grab the area ►

Figure 3. With the visual weights of the elements set, balance them on your background pattern.

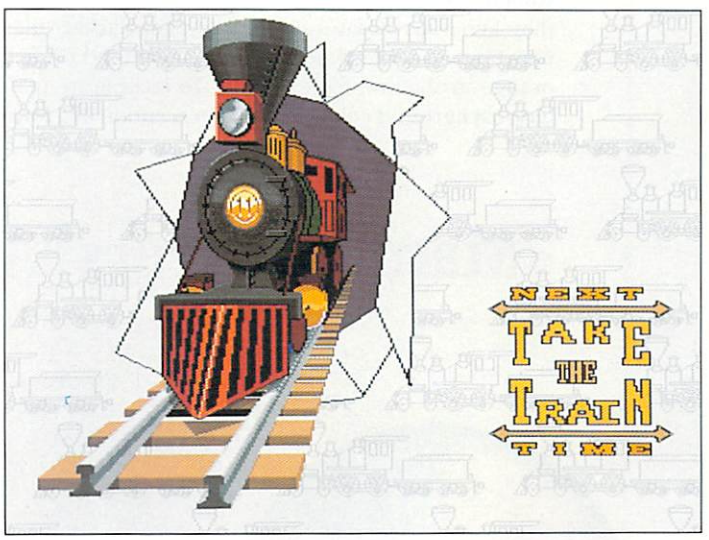

Figure 4. Add the highlights and shadows to provide the final touches.

you want your shadow to occupy as a brush, select the shade option, and stamp the shadow down with the left mouse button to darken the area. This will, of course, produce a perfectly uniform shadow with hard edges. Creating diffuse edges and natural light-falloff requires old-fashioned hard work. Full-spectrum programs, such as Photon Paint 2.0 (MicroIllusions, $149), have special tools to create feathered shadows.

For a variation, you could use aerial perspective to enhance depth. Aerial perspective refers to the natural tendency for objects to fade increasingly as they move away from the camera plane, usually as a result of atmospheric haze. Colors become less saturated, and contrast diminishes. An extreme example is a foggy morning on which visibility is reduced to only a few yards. While aerial perspective does not apply to the train picture because of the precarious contrast on the left side of the boiler, it is useful for illustrating such images as mountains in the distance.

Color: Off Is On

Color theory is almost as important as shading for adding visual depth and weight to pictures. With color, however, what you do *not* do counts. The object you draw, in this example an engine, is made of variously colored parts. Do not draw them with the correct colors. A mirror is not silver, nor a pond dark brown, nor a tire black. All objects, no matter what their colors, reflect the environment around them.

When placed in light and shadow, a given color will take on a range of values. As colors get brighter, they generally desaturate. As they get darker, they may take on a whole new color. Yellows tend toward orange in shadow, for example. To complicate matters, background colors shift the perception of a foreground color. Red on blue feels a lot more "red" than red on orange. The same holds true for background intensity. A red that appears bright on a black background looks very dark on white.

You can correct for this phenomenon and use color to enhance depth. The most common way is to contrast an easy-to-see color on a background color that is opposite it on the color wheel. (See "Color Roulette," p. 38, Sep. '90, for a handy way to test combinations.) Yellow is a good example, because its spectral wavelength is in the range most people find easiest to see. Opposite it on the color wheel is violet. (Now you know why so many jewelers display yellow gold on dark blue velvet.) The white paper background for the engine does not permit this sort of color contrast, so I use another trick: Essentially all the detail and colors are located on the engine, not in the background. They get brighter the further out they come.

The engine is a very "clean" drawing. The important details are all present, in the right places and properly colored and shaded. No unnecessary details confuse the viewer. There are a lot of details, however, that the viewer does not see but would miss if they were absent—subtle shadows and relections, forced contrasts surrounding text to make it more visible, concentrated colors, and plenty of anti-aliased lines (to remove the "jaggies" on highly contrasting diagonals). Details like these let the image project forward. They give it depth and mass and make it jump out from the two-dimensional page. ■

Brian Williams is a computer illustrator for multimedia productions, educational projects, and games. He also lectures frequently on art and animation techniques. Write to him c/o AmigaWorld *Editorial Dept., 80 Elm St., Peterborough, NH 03458.*

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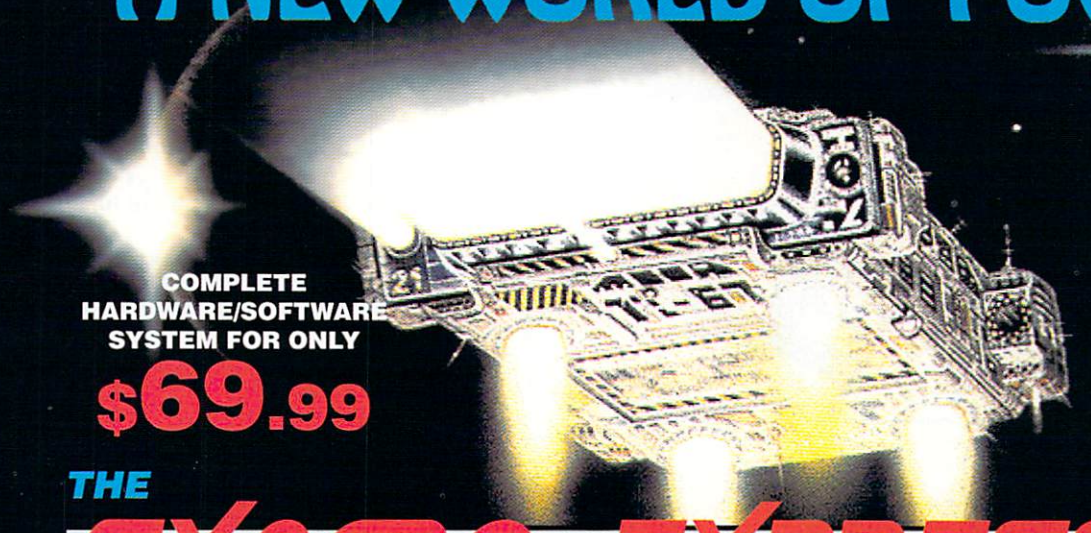

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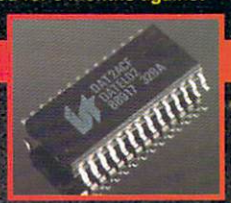

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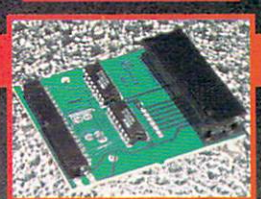

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Variation, Not Duplication: The Repeat Key

#23

A continuing series of tips, techniques, and tricks for creating more imaginative Amiga graphics.

By Joel Hagen

A "REPEAT-KEY" function can be a very useful feature in a paint package, especially as so many paint-program operations are becoming increasingly adjustable. The concept is simple (a repeat key merely repeats your last operation to the screen), yet not every program includes this feature in its repertoire. One program, Digi-Paint 3 ($99.95, NewTek), however, does make excellent use of the repeat key, and this month we'll explore the use of this powerful feature in the course of creating an abstract painting.

Controlled Transparency Is The Key

Specifically, Digi-Paint 3 effectively incorporates the repeat-key concept into the philosophy of HAM painting. To me, the key element in HAM painting is not that you have 4096 colors with which to paint; rather, it is that you can make use of controlled transparency. This is possible because the full range of colors is accessible. Utilizing controllable transparency, the computer artist can achieve effects analogous to watercolor washes, drybrush, and oil glazes. By combining "undo" and "repeat," you have the power to experiment endlessly with drastic or subtle adjustments to those (and other) effects.

In this respect, the computer artist has the advantage over an artist using "traditional" media—where an experiment is a real commitment. Here experiments can be undone. A repeat key essentially allows the artist to change history—to set up a new effect and have it otherwise occur in precisely the manner as the previous action. It offers a solution to that problem artists so frequently encounter in the middle of a work: "If only I could have another chance. If only I could go back and do it again, knowing what I know now."

Digi-Paint's interface contains both an Undo button and a Repeat button. The keyboard shortcut for Undo is u, while for Repeat it is F5. The Escape key toggles the interface area on and off. If you learn no other keystroke shortcuts in Digi-Paint, learn these.

To begin, remain in the normal mode with a black background for painting, and make some basic adjustments to Tools and Controls. In Tools, set Dither to either random or ordered. I usually use random, but ordered can give a texture effect similar to canvas or charcoal paper. Turn Fill on and select rectangles for the first stages. Choose the single-pixel brush. In Controls, select Point Hotspot above the red ball. Set the left transparency slider three-quarters of the way up so the hotspot area of a shape is nearly, but not completely, opaque. Set the right slider all the way down to zero for totally transparent edges.

Moving the hotspot in the ball box now determines which part of a shape will have the most saturated color. Begin with the hotspot all the way in the upper-left corner. Select yellow from the palette and press ESC. Drag a rectangle across the full screen. As it fills, you see that there is intense yellow at the upper left and nearly pure black remaining at the lower right. Press ESC to toggle the menu on (or click the right mouse button to accomplish the same thing).

Select red from the palette, pull the hotspot to the upper-right corner of the box, toggle the interface off with ESC and press F5. This repeats your last operation of a full-screen filled rectangle, but with a new color and a new hotspot. Intense red at the upper right feathers into the yellows. Try blue with a lower-right hotspot and green with a lower-left

Making use of the repeat key in programs such as Digi-Paint 3 can add interesting effects to your HAM painting experiments.

one. The screen becomes a subtly shaded spectrum.

Experiment with other colors and hotspot settings, drawing smaller rectangles here and there. When a shape works, keep it and draw another. If it is unappealing, undo it, set a new hotspot, try a new color, and press F5 to see the new version in the same location. Keeping the hotspot near the center will produce soft-edged shapes. The accompanying illustration began in this manner with corner colors of reds, browns, and yellows.

Abstract Experiments

Now that you have the hang of using the keyboard with one hand while you use the mouse to paint, select Filled Freehand from the Tools interface. Again set the hotspot at the extreme upper left. Choose a bright color and draw a quick stroke on the screen. The starting and terminating points of the stroke will be automatically connected to form a shape. Now experiment with Undo to toggle the new shape on and off. Reset the hotspot or go into the full palette for a new color, and then hit F5.

With complex freehand shapes, the value of a repeat key becomes apparent. The shape you have drawn may be perfect, but the edge might be too hard. Undo it, adjust controls and color, and then repeat. To increase the effect of an operation, repeat it with no changes. One reason I seldom use full opacity in my controls is that I prefer to gradually "glaze" an area up. You can repeat an operation over the same shape as many times as you wish for cumulative effect.

In addition, you can combine multiple effects in exactly the same shape or area. To try this, set the hotspot at the upper left, select yellow and draw a complex, rounded shape. Now select blue, set the hotspot to lower right and press F5. The shape becomes nicely modeled with an even blend of color. Warm color delineates the top edge and cool color the bottom edge, with a suggestion of light direction from the upper left. This is a very powerful feature that incorporates the accuracy of the computer with the kind of serendipity one comes to expect from traditional media. The repeat key allows you to experiment with controlled accidents.

I finished my simple abstract by selecting the Darken mode from the menu and "carving" a few deep shadows into the piece. I set up crisp edges in the Darken mode with the hotspot control and used these edges to define a few of the brightly colored shapes in the image. All the modes and tools respond to the transparency controls, providing endless combinations and effects. If you are new to HAM painting, you can get off to a fast start with this simple technique that employs only a few effective tools and tricks. ■

Effective use of Digi-Paint's repeat key allows you to experiment with shapes and colors in any number of interesting ways, such as the subtly shaded spectrum of colors produced in the illustration "Fabric" (above).

Joel Hagen's credits include work in art, astronomy, science fiction, and software development. Write to him at 10512 Sawyer, Oakdale, CA 95361. Please include a stamped, self-addressed envelope for a reply.

Adding Gadgets in C

By David T. McClellan

INTUITION PROVIDES STANDARD gadgets, such as the close, front-to-back, and resizing gadgets at the corners of a program's window, but you can easily add your own gadgets inside a window or to its border. With simple C data structures and a few calls, your program can tell Intuition what your gadget looks like, where it's placed in relation to the window borders, and what its gadget ID is. Then, when the user of your program clicks the mouse on that gadget, Intuition sends your program GADGETDOWN or GADGETUP events, including the ID of the clicked gadget.

To demonstrate this, I'll walk you through the code behind a Quick-Zoom gadget, similar to one in the Macintosh and Amiga OS 2.0. It sits in the window's top-border drag bar and looks like a square button with a smaller square inset in its top left corner. When clicked, it zooms the window out to its maximum size or back to its previous smaller size and position. The gadget works faster than seizing and dragging the standard sizing gadget, and its underlying routines illustrate how to put a gadget in the top border (drag bar) of a window.

First, you must define your gadget's image and structural information. The following routines do so for our Quick-Zoom gadget.

```
#define HEIGHT 100 /* Initial, min, max height and width */
#define WIDTH 300
#define MINWIDTH100
#define MINHEIGHT 50
#define MAXWIDTH640
#define MAXHEIGHT 150
  /* Gadget id, image info */
#define GID_ZOOM1
#define GAD_HEIGHT 12
#define GAD_WIDTH 16
USHORT chip Zoom_Pict[GAD_HEIGHT] =
{ 0x0000, 0X3FFC, 0x318C, 0x318C, 0x318C, 0x3F8C,
  0x300C, 0x300C, 0x300C, 0x300C, 0x3FFC, 0x0000};
struct Image Zoom_Image={
  0,0, GAD_WIDTH, GAD_HEIGHT, 1, Zoom_Pict,
       0x1,0x0,NULL};
struct Gadget Zoom_Gadget={ /* Gadget for Zoom */
  NULL,   /* Next */
  -80,0, GAD_WIDTH,GAD_HEIGHT,  /* Left, Top,
       Width, Height */
  GADGHCOMP | GRELRIGHT | GADGIMAGE,  /* Flags */
  TOPBORDER | RELVERIFY, /* Activation */
  BOOLGADGET,   /* GadgetType */
  (APTR) &Zoom_Image,  /* GadgetRender */
  NULL,NULL,0L,(APTR) NULL,  /* Various don't cares */
  GID_ZOOM,   /* GadgetID */
  NULL   /* UserData */
};
```

Note the keyword chip in Zoom_Pict. This is a Lattice C addition, which puts the image in chip RAM, necessary for rendering. If you are using Aztec C, you will need to copy the imagery manually into an allocated chunk of chip memory.

To hold the previous window position/size, we define struct WinSizeStorage, of which we'll attach an instance to our opened window's UserData pointer:

```
struct WinSizeStorage {
  SHORT left, top;   /* Old left, top */
  SHORT width, height;   /* Old width, height */
};
```

Now, to install the gadget up in the drag bar, we use the ROM Kernel call AddGadget( ) *after* we open the window. The reason for this order is that system gadgets end up first on the system list at OpenWindow( ) time, with user gadgets attached after them. If we did not specify AddGadget( ) first, a click on the Quick-Zoom gadget would be interpreted as a click on the dragbar.

By using AddGadget( ) on an already open window, we can put Quick-Zoom first on the list, ahead of the dragbar, so that clicking it will result in the GADGETUP message we need. Because Quick-Zoom does not cover the entire drag bar, the remainder can still be used to move the window. Now let's look at the relevant initialization code:

```
struct NewWindow newwin;
struct Window *win;
```

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```
struct WinSizeStorage *wss;
  /* Insert program-specific initialization code here */
  newwin.IDCMPFlags = CLOSEWINDOW|
        NEWSIZE|GADGETUP;
  newwin.FirstGadget = NULL;
  win = (struct Window *) OpenWindow(&newwin);
  wss = (struct WinSizeStorage *) AllocMem(
    sizeof(struct WinSizeStorage), 0);
  win->UserData = (BYTE *) wss;
  /* Add to front */
  AddGadget (win, &Zoom_Gadget, 0);
    /* & draw */
    RefreshGadgets(&Zoom_Gadget, win, NULL);
```

The above tells Intuition we want Gadget messages on release of the mouse button (GADGETUP), gives us a previous-size storage area attached to the window, and adds the gadget in front of the system gadgets. Now for the actual resizing code:

```
/* Messages from Intuition */
switch (message->Class) {
case GADGETUP:
  msggad = (struct Gadget *) (message->IAddress);
  switch (msggad->GadgetID) {
    case GID_ZOOM:
      wss = (struct WinSizeStorage *)
        win->UserData;
    if ((win->Width != MAXWIDTH) ||
    (win->Height != MAXHEIGHT))
      { /* Not at max size. Save old size,pos */
    /* Move left/up, then grow */
    wss->left = win->LeftEdge;
      wss->top = win->TopEdge;
      wss->width = win->Width;
      wss->height = win->Height;
    MoveWindow (win,
      -(win->LeftEdge),
      -(win->TopEdge));
    SizeWindow (win,
      MAXWIDTH - win->Width,
      MAXHEIGHT - win->Height);
      }
      else
      { /* Shrinking - resize first */
    SizeWindow (win,
      wss->width - win->Width,
      wss->height - win->Height);
    MoveWindow (win,
      wss->left - win->LeftEdge,
      wss->top - win->TopEdge);
      }
    /* Now repaint the window if necessary */
    ...
    break;
  }
  break;
}
```

This section of code is inside a standard message loop. To enter it, the program checks the Intuition message to determine if it is GADGETUP. Upon confirmation, the first thing the program does is retrieve a pointer to the size storage area, and then look at the current size of the window. If it is not at its maximum size, the program resizes it up to the maximum after storing its current size and position. If the window *is* at its maximum, however, the program sizes it down to the previous smaller dimensions. Finally, the program does any necessary repainting, and it's done. ■

David T. McClellan is a contributing editor to AmigaWorld. *Write to him at 104 Chevron Circle, Cary, NC 27511.*

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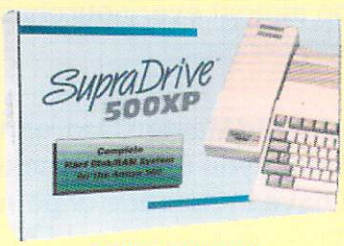

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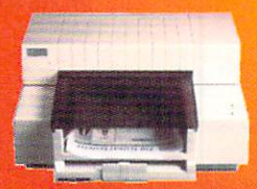

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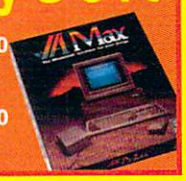

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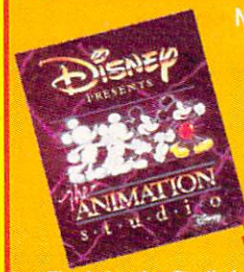

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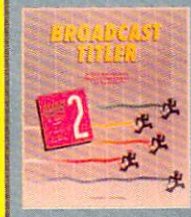

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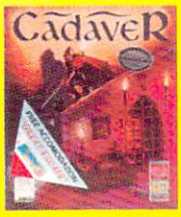

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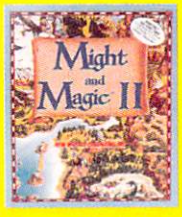

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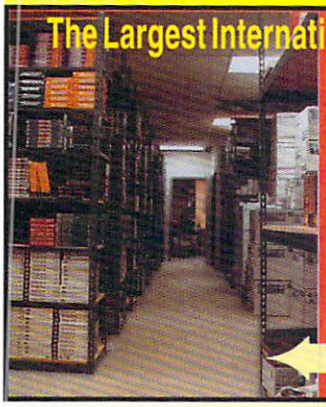

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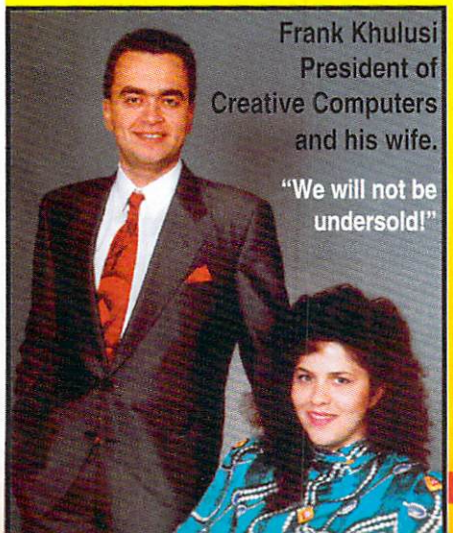

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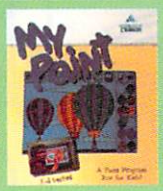

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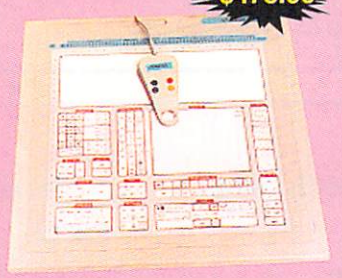

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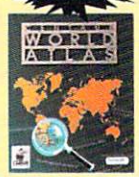

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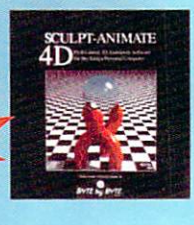

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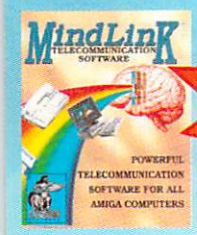

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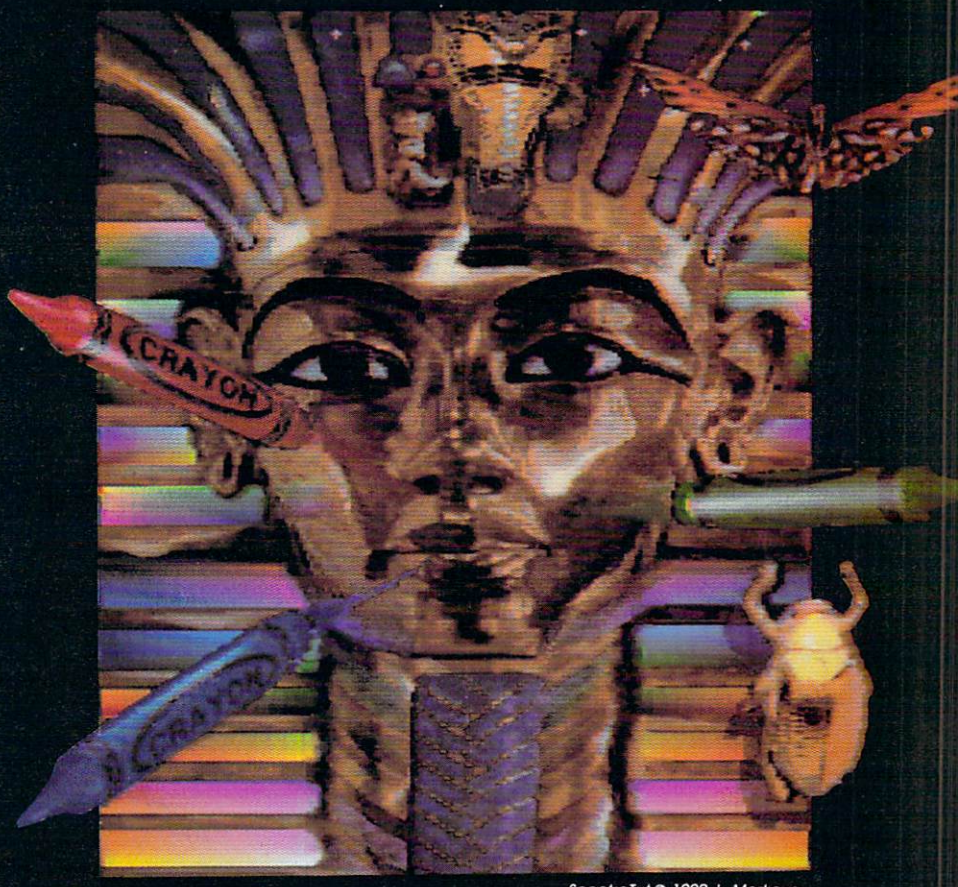

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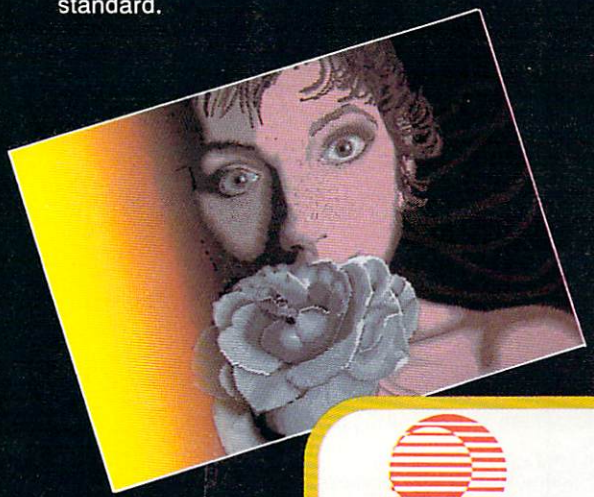

(Above) ***Kate*** *by Cheryl Austin. Created with SpectraColor. (Left) SpectraColor's innovative new Color Manager.*

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MASTERING

Multi Media

MIDI and SMPTE Compatibility

By Jamie Krutz

DANCING IS FUN, but timing is everything. MIDI and SMPTE time code are standards for music and video production that keep your multimedia production dancing in time.

Why Use MIDI?

MIDI (Musical Instrument Digital Interface) is a scheme that allows computers to record musical performances and play them back through electronic musical instruments. One obvious use for MIDI is to drive external sound modules, such as stand-alone synthesizers and samplers. You can even then combine their output with the Amiga's four 8-bit internal voices for music and sound effects. A single MIDI sound module can support as many as 32 voices, with each voice being a different type of sound. Because the Amiga's custom sound chips keep sounds in chip RAM, using MIDI for sounds can also save chip RAM for graphics use.

Emu, Yamaha, Casio, Ensoniq, Roland, and Korg all build suitable sound modules, with and without keyboards, that sell from about $300 to $4000. I prefer sound modules that support velocity and aftertouch data for musical expressiveness and MIDI volume control, so that I can have the relative level of the sounds controlled from the computer. In addition, I recommend looking for multitimbral capabilities, which allow one sound module to provide many instruments at the same time, each listening to its own MIDI channel and each playing an individual line of music.

MIDI can do more than control music. With the proper MIDI-controlled equipment, you can use MIDI to run a lighting system and to control tape decks and other equipment, making your Amiga the control center of a complex multimedia production. You can also send MIDI into your Amiga from an external box to control some multimedia programs. You can trigger animations or still graphics from another computer, a MIDI keyboard, MIDI wind controller, MIDI violin, MIDI drum pad, MIDI tap shoes, or whatever.

To use MIDI on your Amiga, you need a MIDI interface box that plugs into your serial port. If your multimedia project needs more than 16 MIDI channels, or if you need a free serial port for a laser disc, tape machine control, or a time code reader, you can add additional serial ports via a card. The Serial Solution (Checkpoint Technologies, $199) supports MIDI correctly with no modifications. Bars & Pipes (Blue Ribbon SoundWorks, $299) or Music X (MicroIllusions, $299.95) are the first Amiga sequencers to support multiple MIDI ports.

How To Use MIDI

There are two ways multimedia software supports MIDI: directly from within the program, and via ARexx interaction with another program that supports MIDI directly. For direct support, AmigaVision (Commodore, bundled with the Amiga or $149 separately) and DeluxeVideo III (Electronic Arts, $149.95) let you play MIDI modules using music saved as SMUS files—although AmigaVision supports only four MIDI channels. You need to create the SMUS files using a sequencing or notation program that supports the SMUS format.

Interactor (Very Vivid, $129) can send individual notes and other MIDI messages from the optional MIDI Expansion Module ($30). Showmaker (Gold Disk, $395) promises the ability to play standard MIDI files, which is what all multimedia programs should support. Most sequencing software on any computer will save and load standard MIDI files. The Director (Right Answers Group, $129.95) with its Director Toolkit ($39.95) can be triggered by MIDI note on/note off messages. PageFlipper Plus FX 2.0 (Mindware International, $299) promises two-way MIDI support.

For indirect MIDI support, Bars and Pipes can be controlled through ARexx, or it can control other programs. It can play MIDI sequences under ARexx control, and its optional Multimedia Kit ($59.95) includes a Bars & Pipes ARexx MIDI player that takes less of your Amiga's resources to run than does the full ►

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program. The Cue Card Tool lets you turn MIDI notes into ARexx messages and simulate keystrokes that allow MIDI to control multimedia programs. This opens a gateway to MIDI from ARexx programs like CanDo (INOVAtronics, $149.95) or Elan Performer 2.0 (Elan Design, $149).

I Sync Therefore I Am

SMPTE stands for "Society of Motion Picture and Television Engineers," a standard-setting organization. SMPTE time code is the industry-standard way of labelling each consecutive frame of a video or film with a unique number showing hours, minutes, seconds, and frames. A second number, the "user bits" number, is commonly employed to show the tape number or date, but you may not need it.

Of the four types of time code (30 frames per second for NTSC video, 30 for drop frame, 25 for PAL video, and 24 for film), you'll probably use drop frame. Drop frame is the same as 30 fps SMPTE time code, except that it makes up for for differences between the frame rate of color NTSC video and real time by periodically skipping numbers, keeping the time-code numbers in line with real elapsed time—much as a leap year brings our calendar in line with cosmic reality.

SMPTE time code is useful in many situations. If you are using more than one computer in your presentation—one for music and one or more for graphics—and perhaps genlocking over video from a disk or tape machine, you can run one master SMPTE time-code track from a time-code generator or a tape-machine audio track and have everything stay exactly together. If you are using a taped soundtrack, put SMPTE on an audio track to sync everything.

If you are editing a video and need to lay an animation onto your tape at an exact location, your graphics program can know when to play the animation by listening to SMPTE. If you are creating music and sound effects for a video, you can lock your sequencer to a videotape, and then write music and create sound effects that will play back in perfect sync with the video. So far, no animation play-back program spits out time code as it plays, so you can't do the same trick directly for writing music for an animation. You might be able to use ARexx and MicroIllusion's TCRG 102 ($799.95) to play back an animation while playing back time code, perhaps from CanDo or AmigaVision.

SMPTE Hardware

To use SMPTE time code, you need a SMPTE reader/generator. There are three available for the Amiga. The Phan- ►

Manufacturers' Addresses

Blue Ribbon SoundWorks
1293 Briardale
Atlanta, GA 30306
404/377-1514

Checkpoint Technologies
PO Box 2035
Manassas, VA 22110
703/330-5353

Commodore
1200 Wilson Dr.
West Chester, PA 19380
215/431-9100

Dr. T's Music Software
100 Crescent Rd., Suite 1B
Needham, MA 02194
617/455-1454

Elan Design
PO Box 31725
San Francisco, CA 94131
415/359-7212

Electronic Arts
1820 Gateway Dr.
San Mateo, CA 94404
415/571-7171

Future Video
28 Argonaut
Laguna Hills, CA 92656
714/770-4416

Gold Disk
5155 Spectrum Way, Unit 5
Mississauga, Ont., Canada L4W 5A1
800/GOLD-DSK
416/602-4000

INOVAtronics
8499 Greenville Ave., Suite 209B
Dallas, TX 75231
214/340-4991

MicroIllusions
PO Box 3475
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818/785-7345

Mindware International
110 Dunlop St. W., Box 22158
Barrie, Ont., Canada L4M 5R3
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PassPort Designs
625 Miramontes St., #103
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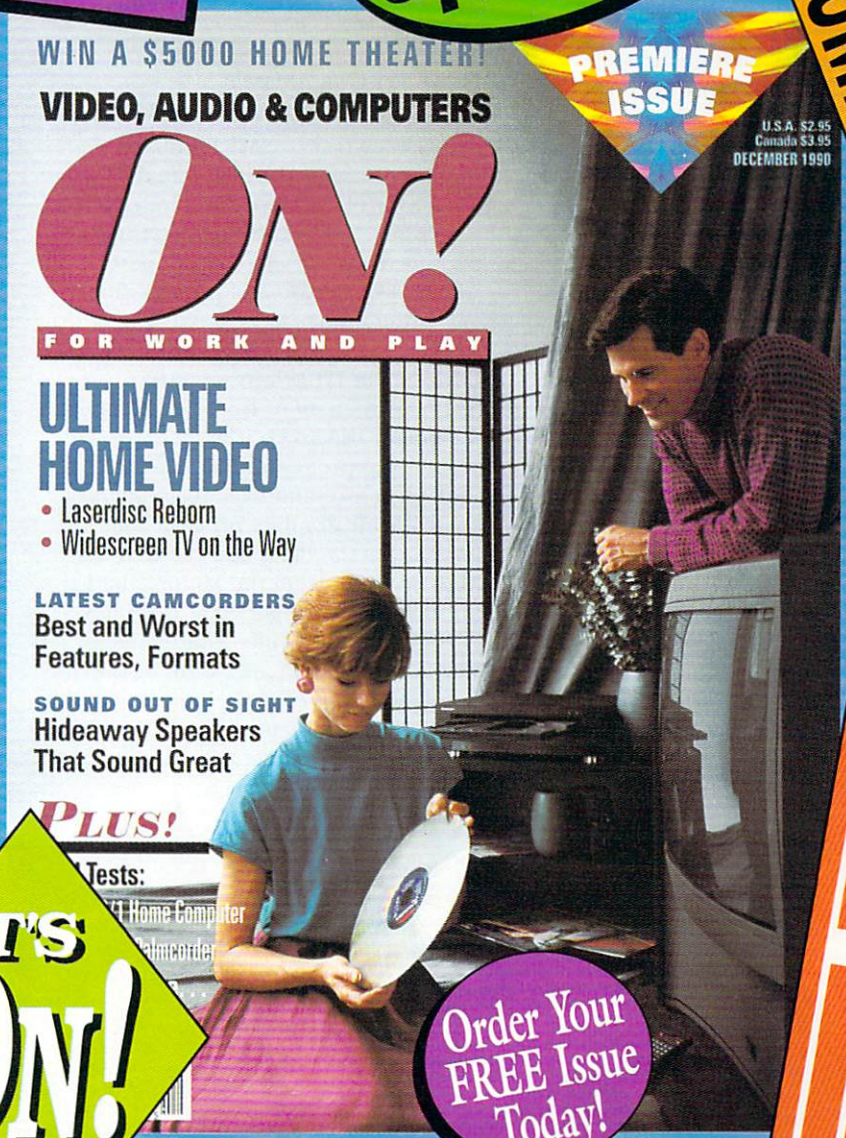

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tom (Dr. T's, $299), a MIDI and SMPTE interface, is supported by Dr. T's KCS Level II sequencer and should be supported by Showmaker. Several other companies are evaluating it, as well. PassPort's MIDI Transport ($459), a more limited solution, is a MIDI and SMPTE interface that works only with the company's Master Tracks Pro ($395) sequencing software.

The TCRG102 time-code reader/generator comes with software to control reading and generating time code, plus window dubbing (using a genlock). It can grab time-code numbers on the fly and write them into any Amiga program, which is great for logging tapes, and it works with Photon Video: Edit Decision List Processor (MicroIllusions, $499.95) to automatically create edit-decision lists for video editing. The TCRG102 can be used with any ARexx program, and is the only unit with a sync input for proper alignment of time code with video, a necessity for video production.

MIDI time code (MTC) is SMPTE/EBU (European Broadcast Union) time changed into a form that can be sent over MIDI. To synchronize such sequencers as Music X and Bars & Pipes to SMPTE, you'll need a SMPTE-to-MTC converter.

How To Use SMPTE

Showmaker promises the ability to trigger directly from a SMPTE time-code number through the Phantom, or by using a SMPTE-to-MIDI time-code converter box. The TCRG102 can trigger multimedia programs that support ARexx, like CanDo and AmigaVision, and programmer Mike Berro is also working on a program that will trigger DeluxePaint III (Electronic Arts, $149.95) animations from the TCRG102.

Another way to go is to lock a MIDI sequencing program to an external SMPTE source and have the sequencer control your graphics program via ARexx. Bars & Pipes and the Cue Card Tool program from the Multimedia Kit are the first to support that capability.

For controlling video editing decks with SMPTE, AmiLink (RGB, $41.50 for serial cuts only) controls industrial and broadcast equipment, while EDL-1000 (FutureVideo, $295) controls consumer and low-end industrial equipment.

A Call to Standards

Right now all programs and all time-code boxes are not compatible. The ideal would be a standard system clock to which all multimedia software could sync—especially programs running together on the same machine—and which could be synced to any of the SMPTE readers. Selection of a SMPTE box, and of multiple serial-port assignments for MIDI and other uses, ought to be as easy as selecting a printer in Preferences. Commodore's upcoming CAMD internal MIDI Standards will help programs share real-time MIDI data, making multimedia uses easier and more powerful.

Even now, with the industry standards of SMPTE and MIDI, your Amiga can get up and dance with the best. ■

Jamie Krutz is a freelance writer, editor, composer, video producer/director/editor/photographer/animator and interactive developer. Write to him c/o AmigaWorld *Editorial Dept., 80 Elm St., Peterborough, NH 03458.*

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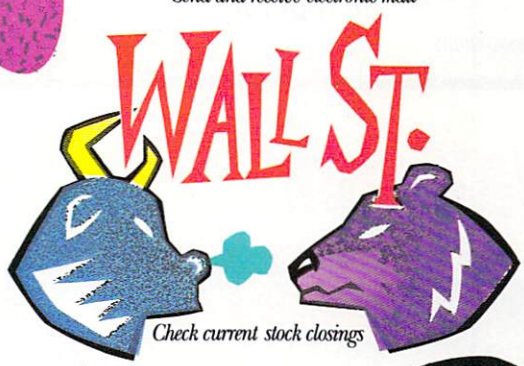

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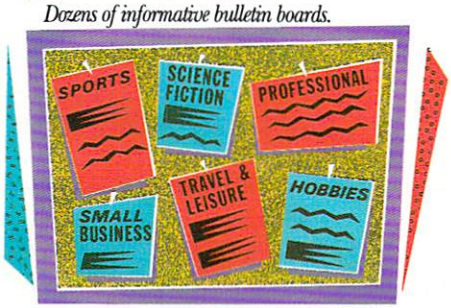

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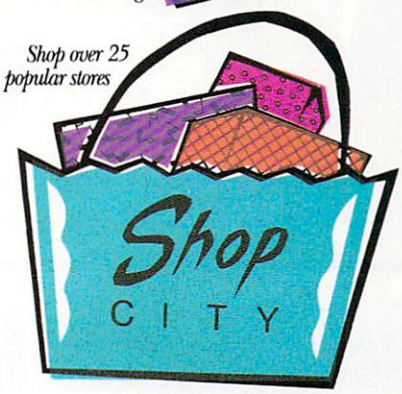

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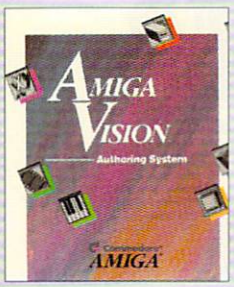

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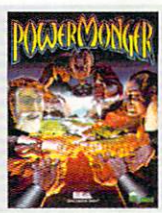

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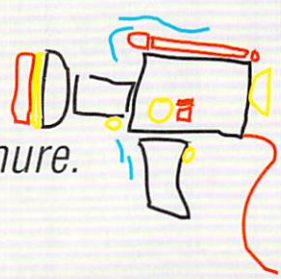

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THE GAME PRESERVE

PRINCE OF PERSIA

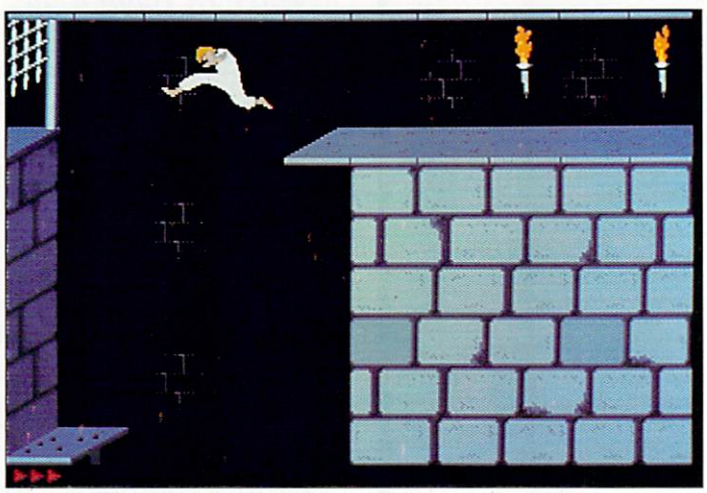
By John Ryan

SET AGAINST THE backdrop of an Arabian castle, Prince of Persia is a superb graphic and sound feast. Too bad its controls are only half-baked.

Prince of Persia aptly harnesses the excitement and action of the old, black-and-white swashbuckling movies. Within the hour, you, as the prince, must rescue the princess from a locked tower and impending forced marriage. The author studied hours of old film footage to pattern the animation as realistically as possible, and it shows. The running, leaping, and fighting is fluid and realistic. As you climb your way up through the levels to your waiting princess, you must contend with spike traps, false floors, sword-wielding guards, and tricky puzzles.

You'll need dexterity, good hand-eye coordination, and problem-solving skills. Throughout the castle, watch for the spring-loaded floor stones; they can lift gates and doors in the dungeon, fall away completely and toss you to your death, or unleash such nasty surprises as deadly spikes. The trick here is experimentation, quick thinking, and timing. You will succeed only after you have learned how to effectively duck, climb, and jump.

Which leads me to my complaint about Prince of Persia: The joystick operation is perhaps the poorest of any action game I have played. To jump, you must press the joystick diagonally, not the most natural position. Needless to say, my character died a thousand untimely deaths until I finally became used to the unwieldy operation. Likewise, you should expect to lose more than a few lives in sword play, for if you accidentally press the joystick down, your man will promptly put his sword away, and the attacking guard shows no mercy.



Leap for your life.

As much as I dislike the controls, I love the graphics, animation, and sound. The pathways, stone towers, gates, and other accoutrements are richly rendered in a quasi-three-dimensional perspective. And the first time you climb a tall tower or see the stone collapse beneath your feet, your heart is sure to beat just a little faster. You may even let out a small yelp when a skeleton unexpectedly pops up and engages you in a wild sword fight (*à la* the old Sinbad movies).

The digitized sound effects are equally impressive, ranging from screams (as you fall from a ledge), to running footsteps, crashing stones, lifting gates, and more. In fact, if it were not for the poor joystick control, I'd nominate Prince of Persia as the action game of the year. ($39.95, Broderbund Software Inc., 17 Paul Dr., San Rafael, CA 94903, 800/527-6263, 415/492-3200. Joystick required.) ►

Crib Notes

By Peter Olafson

SHOULD OLD ACQUAINTANCE be forgot, you probably just need to restore your last-saved game. I'm feeling as contrite as a 25th-level fighter who beats up on an innocent character. So, here are my New Year's resolutions . . . for game resolutions.

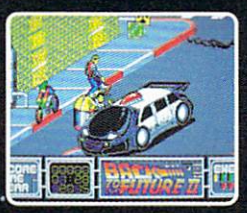
• *I will print no hint before its time.* Last year, I heard from SSI that *Pool of Radiance* (Strategic Simulations Inc., $49.95) was planned for April, so I tore through an early version to have hints ready for that issue. Problem was, Pool of Radiance didn't come out until September.

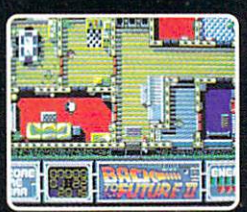
Ahem, now that it *is* out, some more advice: The city clerk, early on, will send you off to the graveyard. Clear the tombstone-filled area around the entry, but put the rest off and do it in increments. It is far more difficult an assignment than anything you have tackled so far.

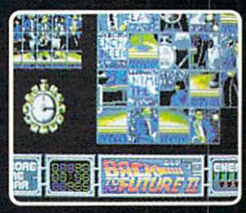
• *I will try to keep my promises.* I meant to get around to a walkthrough of the second castle in *Drakkhen* (Draconian, $59.95), but something always seemed to come up—like getting killed in the first castle. At last, here it is:

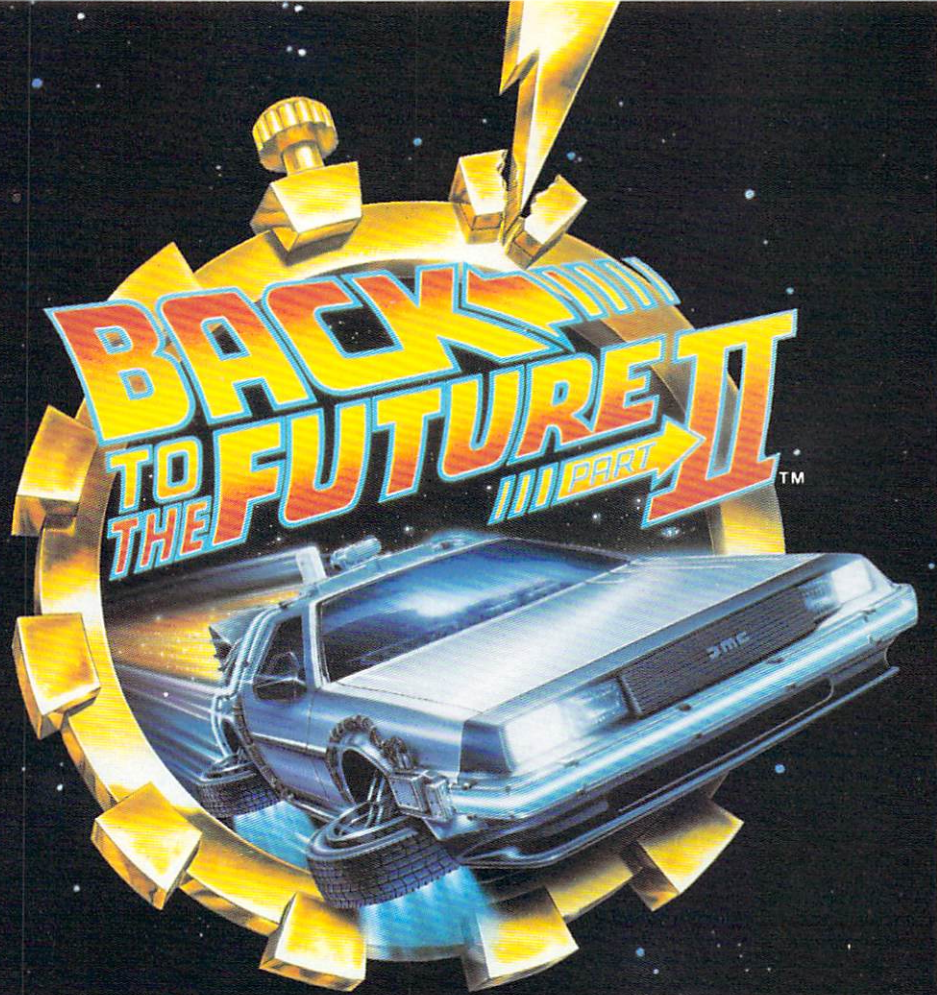
We'll pick things up at the "bat room." The bats are pretty wimpy, but there's some kind of life-drainer at work here. Keep your party closely packed before you enter the room, and don't go into combat mode. You can't afford the delay. You can take care of the bats in the next room. (And look around for reading matter in the next couple of rooms.)

Here's trouble: It's the first fireplace room, and you're asked to look at the ►









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MIDWINTER

By Peter Olafson

A 3-D, ROLE-PLAYING wargame, Midwinter has an easy sweep, deceptive depth, and a vastness that can only have been drawn from real life. You are Captain John Stark, and, as leader of the FVPF on the vast, frozen Midwinter Isle, you suddenly find yourself the brains behind a guerrilla campaign against the invading General Masters. A new Ice Age was set off by a giant meteor's collision with Earth, and Midwinter has become extremely valuable real estate.

You play much of the game in the first-person mode in a light-sourced, three-dimensional environment. Ski down a hillside at 45 mph with snow hissing in your ears. (Watch those missiles.) Find a garage and fire up a snow buggy. (Watch that slope. Snow buggies can tip over, y'know.) Ride a gondola lift up the mountain. At the mountaintop, ride a hang flyer down to your next stop. Watch those downdrafts. Midwinter is one of a handful of computer games that are absolutely involving; you *feel* like a character in it.

As a place to explore, Midwinter is great fun. As a full-fledged game, it's nothing short of staggering. 32 people with 14 qualities and skills must be woven together to perform sabotage and sniper duty, to cross the ice to persuade others to join in the fun, and finally to raid the enemy stronghold. Make sure that you stay sensitive to the web of interpersonal relationships and plan carefully; the gang aren't all friends.

The icon-based menu screens make planning easy. Even when you're in the middle of nowhere, you'll know where you are. Of course, enemy ground forces and bombers are having at you almost from the word go, so don't stand around with ice on your face while you decide. (Thankfully, there's an option to turn off enemy troops while you're learning the game.)

Now, Midwinter's heart may be warm as toast, but its extremities are somewhat chilly. You can't install it on your hard disk or make a backup. For copy protection, it uses the new and intimidating practice of identifying individuals among a throng of mostly similar faces. Finally, the manual is poorly organized and contains at the outset far too much scientific or pseudo-scientific rationalization of the scenario.

Do yourself a favor, however, and take the time to maneuver around these obstructions. Midwinter is a genuine Amiga classic. You won't be sorry. ($39.95, Microprose, 180 Lakefront Dr., Hunt Valley, MD 21030, 301/771-1151. No special requirements.)

BRAINBLASTER ACTION PAK

By Rob Lawrence

WHEN I SEE something labeled "two in one," I'm immediately suspicious of a rip-off. The two-in-one Brainblaster Action Pak, however, gave me a surprise: double my money's worth! Brainblaster is composed of two complete games: Bombuzal, a perplexing series of arcade-type puzzles on a single disk, and Xenon 2, a fantastic, double-disk space blastfest. Both were designed with brilliance, and either is good enough to be sold alone.

Bombuzal puts you in a race against the clock to detonate a multitude of bombs on increasingly difficult levels of tiles. The creature you control resembles Mr. Potato Head, and is just about as agile. Once you activate a bomb, it explodes when you step to the next tile and detonates any other bombs nearby. Because bigger bombs have bigger bangs, you must be careful not to get caught within the blast radius.

Aside from bombs, you must also evade or destroy mines and a few odd-looking droids. Some of the floor tiles are icy, causing you to spin uncontrollably, and others dissolve when you move off them, so you must constantly think ahead. With 120 levels of cartoon-quality graphics (2-D or 3-D view), Bombuzal will prove a challenge to even the most quick-witted.

Xenon 2 can be summed up in three words: fast, furious, fabulous! It's a good old shoot-'em-up stretched to the limit and cram-packed with action. As a Galaxian Megablaster pilot, you must find and destroy five time bombs ►

ashes. Would you walk out in the middle of a busy street if I told you to? You'll trigger a string of very aggressive fire elementals. Steer clear. For maximum control, bring your party through one member at a time and stay out of combat mode.

The second fireplace, however, does something quite different and quite useful (though you won't know it straight off). Listen for a clue, a knock sound. If you're finding only dead ends afterward, you didn't trigger it.

How nice! A fountain. . .in a dark basement room. Before you go and examine it too closely, be sure *everybody* has a torch (or a light spell).

You teleport into a room of water elementals. Suggestion: Keep your cool, and stay out of combat mode as long as you can, as the elementals may not attack at all. Go straight for the armor and weapons on the wall and then get out. Don't miss the prisoner in the next room.

You're going to have to fight the elementals eventually, but it's better to have your party intact when you do. The room off the bottom of the screen isn't completely safe, but it's close. You have one more room to tackle. I suggest a solo visit. Just remember that lightning is bad for you, and that it's better to have your opponent come to you.

• *I will try to get hints out faster.* Debbie Dempsey of Kent, Washington, wrote me back in June for help going underground in *The Jetsons* (Micro-Illusions, $39.95), and only now have I found her an answer. You have the right idea about the use of the crystal key, Deb, but you have to use it on the five panels in a certain order. Not a nice puzzle, and you have to do it again later, too. The first three panels for this door are yellow, purple, and green. That information should make it a bit easier.

Patrick Atkinson of Paso Robles, California, is stuck in the mall in the same game and trying to figure out how to buy the mini submarine on George's salary. As I recall, it's a red herring. Do visit Travel Concepts, however, for a couple of useful items. You can pick up a dress and tux at the mall, too. It won't win you the ►

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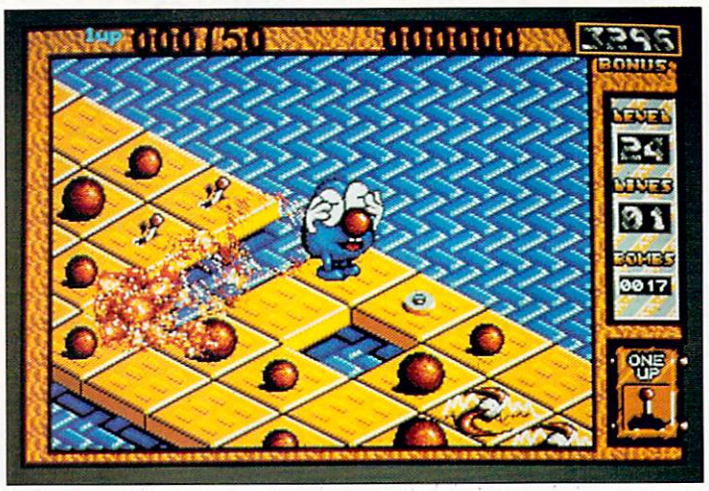
deployed on a planet by the evil Xenites. There are five huge, twin-segment levels (each with a massive guardian creature at the end) to complete before the finale. Countless types of crazed life forms and machines see to it that you get a good fight along the way. Dead creatures often leave behind cash bubbles that you can collect to purchase extra shield power and instruments of destruction. The more dough you have, the more awesome your arsenal of firepower can be.

The graphics, animation, and sound effects are a definite 10, and the outstanding bass sound track, composed from tidbits of digitized rap, jams along with the game. The tri-layered, vertically scrolling background gives it depth, and the shaded details are remarkable. Aside from a high-score table you can't save, I have no complaints.

I'm surprised that this duo wasn't labeled with an addiction warning; from the moment I booted them up, I was hooked. Brainblaster Action Pak is a steal! ($39.95, Cinemaware, distributed by Electronic Arts, 1820 Gateway Dr., San Mateo, CA 94404, 415/571-7171. Joystick required.)



Puzzle and blast your way to safety.

LOOM

By Graham Kinsey

IN LOOM, YOU are Bobbin, an orphaned child of a reclusive guild clan named the Weavers. The Weavers use cloth and music to weave magic that is unrivaled. With no substantial help, you must unite the realm's warring craft guilds against the growing forces of chaos—and defeat Lord Chaos yourself!

How Bobbin and the Weavers cast spells is the most interesting part of Loom. To cast a spell, you must sing four musical notes that cause a Weavers' staff to create powerful magic. Because Bobbin is an outcast of the clan, it is forbidden to teach him the notes for the various spells, and he must learn them on his own.

Loom is totally mouse-controlled: Simply click on an object or person to find out more information. While people spew forth lots of details while telling nice stories (over which you have no control), I found most of it to be useless drivel.

On a much sadder note, presentation is quite inadequate. The graphics are very poor, with dithering that sticks out like a billboard. The animation is bad, even on a 68030-based Amiga. The sound effects are equally mediocre, although I did like the prelude story that comes on an audio cassette (a CD version is available for $10).

To top it off, I was able to finish the game in merely eight hours; only novices need apply. ($59.95, Lucasfilm, distributed by Electronic Arts, 1820 Gateway Dr., San Mateo, CA 94404. 415/571-7171. No special requirements.)

DAMOCLES

By Peter Olafson

CONSIDERING HOW MANY adventures are available for the Amiga, I'm amazed so few have real atmosphere. Too many games give the overriding sense of. . .well, of sitting at your Amiga playing a computer game. Standing out from the rest is Damocles, a ► game, but your family will approve.

• *I will play* Dungeon Master *(FTL, $39.95) through again.* Lately, requests for help in DM (and Interplay's Future Wars) are outpacing everything else. For instance, Timothy Bell, of Round Rock, Texas, is stuck at an obstinate door on Level 8.

For starters, Tim, leave the switch alone. It's a trick: It dumps a chest (which you can get much more easily by other means) into a pit. Instead, go right; you'll eventually come upon some stairs leading up. Use them, and then use a trap door to come back down. Now you're on the other side of the door, and you can open it *and* take the chest.

For Jef Dinsmore of Punxsutawney, Pennsylvania: The three rooms after the "riddle room" on Level 5 aren't too tough. In the first, there's a switch controlling a teleporter. Teleport an item to shut the trap; then open the door and throw the switch again to get your property back. In the second and third, kill off the monsters, check the walls for switches and hit them in the right order to open a secret door concealing the keys. As for your other question, Jef, I'll tackle it next time.

• Two last things: I have a new address: 12 W. 104th St., Apt. 3E, New York, NY 10025. (You can still reach me by E-mail on GEnie as P.Olafson and on P/Link as Peteroo.) If you need your game hint fast, like yesterday, send a self-addressed stamped envelope with your letter.

Next time, hints on everything under the sun. And perhaps on a few things that have never seen the sun. (Ghoulish laughter recedes.)

COMPANIES MENTIONED:

Draconian, distributed by Data East, 1850 Little Orchard St., San Jose, CA 95125, 408/286-7074.

FTL Games, 6160 Lusk Blvd., C-206, San Diego, CA 92121, 619/453-5711

MicroIllusions, 17408 Chatsworth St., Granada Hills, CA 91344, 800/255-5217, 818/360-3715.

Strategic Simulations, distributed by Electronic Arts, 1820 Gateway Dr., San Mateo, CA 94404, 415/571-7171. ■

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grand-scale, three-dimensional adventure that's about the loneliest game in town. It has a quietly creepy atmosphere, which is fully appropriate to the plot.

In Paul Woakes' followup to his earlier Mercenary: Escape From Targ, the inhabitants of Eris have evacuated to make room for a comet, and you—still a mercenary—are enlisted to stop it. The bounty for success is healthy, and there's a premium for a solution that isn't destructive. (Hear, hear!)

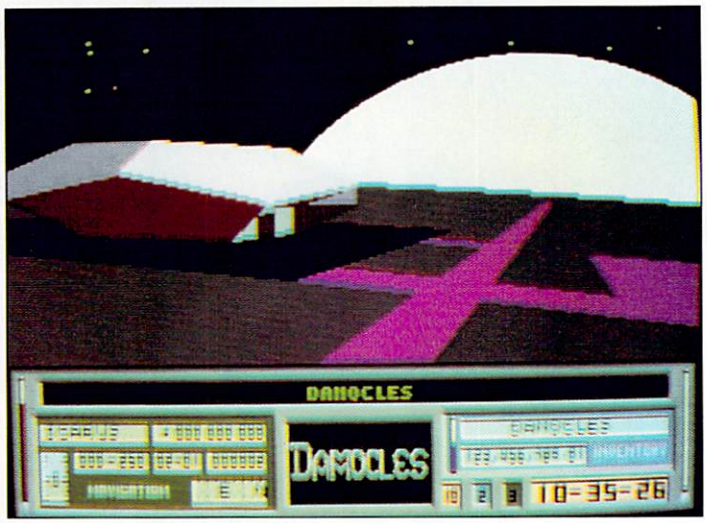
Mercenary was large in scope but quite basic in appearance. The Damocles universe is even larger (nine planets and 19 moons) and features solid-fill graphics, sizable cities, and more detail than you can shake a joystick at. You could furnish a mansion with the furniture you'll find in Damocles.

Even better, all this good stuff loads into memory at once, even on a 512K machine, so the only disk access necessary is for saving and restoring. Commands, only a key-press away, are easy to remember, and the planes and spaceships with their basic controls are a joy to fly.

Don't gawk at the scenery too long. Damocles is looming ever closer. Keep your exploring quite pointed if you mean to take care of the comet. Despite the occasional house-to-house search, the game doesn't lead you astray. Its puzzles and surprises (both pleasant and unpleasant) are well laid out.

A couple of caveats. The sound is only so-so; there isn't much of it, as you'd expect, but my television static sounds better than that spaceship engine. The more than two-minute intro is fun to watch the first couple of times, but it repeats every time you boot up. I wish I could go straight to the game, instead. The frame rate is good, but still a notch or two below the seamless movement of which the Amiga is capable. The 3-D system is delightful for its depth and consistency, but it occasionally reveals small objects beside buildings before the buildings themselves appear.

All in all, I think we'll survive, even if Eris doesn't. Like its namesake, Damocles shines. ($44.95, Novagen, distributed in the US by Bethesda Softworks, 15235 Shady Grove Rd., Suite 100, Rockville, MD 20850, 301/926-8300. Joystick required.) ■



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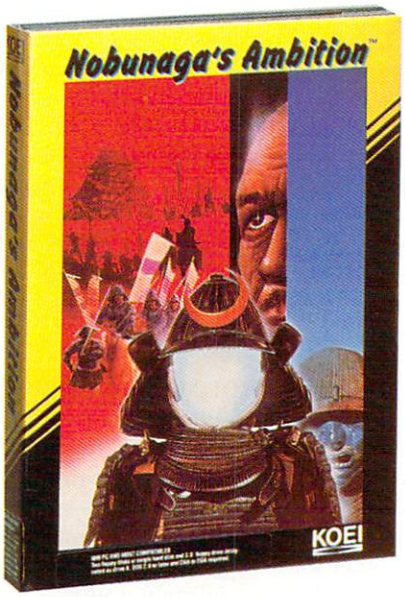

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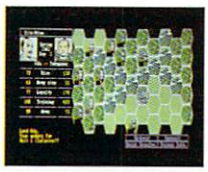

Battlefield Map

Ending Screen

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3) What was the epic describing the power struggle at the end of China's second Han Dynasty called?
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From p. 24

Master. It features a thin, pointed tip that is easy to position on a line. Double-clicking with the stylus button is, however, a pain. In order to effect this common Amiga action, I had to hold the pen nearly perpendicular to the tablet. It was very awkward.

THINGS TO THINK ABOUT

If you are an artist new to graphical interfaces, I think you will like Easyl best of all. It offers an easy transition from paper to electronic drawing. Experienced mouse users, though, may find it slow. For them, I would recommend R&DL's AProDraw package because of its more responsive software, even though I do not like its stylus.

In fact, I found none of the systems suitable in a point-and-click environment. It takes too long to get anywhere. You can speed things up by placing a paper or plastic template on the pad to let you access, say, the DeluxePaint toolbox. (You can even make one by printing a screen dump of the right size.) Still, a tablet will not replace your mouse. Therefore, I suggest you check to be sure that any new units support simultaneous use of the mouse.

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DATALINK 2000

Chairman of the modem-features board

By Sheldon Leemon

THE DATALINK 2000 modem from Applied Engineering is not the first internal modem for the Amiga 2000/3000 series of computers, but it can claim a number of other important firsts. It's the only Amiga modem thus far to provide auto-configuring driver software on ROM, the first to offer an MNP level-5 option, and the first with a facsimile-transmission option. Translated into plain English, that means it's convenient, flexible, and expandable.

The DataLink (DL2000) modem comes on a half-length plug-in card for the A2000 or A3000. A cable connects the card to a mounting bracket that holds two modular phone jacks—one that connects to the phone-line wall jack; the other for an optional phone connection. Hardware installation is as easy as removing the computer's cover, plugging in the card, and screwing in the bracket. An integral speaker allows you to hear the modem dialing, but there are no software equivalents for the status lights found on many external modems.

The device driver that allows Amiga software to talk to the modem as if it were a serial port is contained on a ROM chip on the card. If your computer has Kickstart version 1.3 or higher (this includes most 2000 and all 3000 systems), the DataLink software automatically adds this driver to your system at power-up time. If, on the other hand, you own one of the few 2000 systems that has a Kickstart 1.2 ROM, you must remove the driver ROM chip from the modem card and install the included disk-based software driver in the DEVS: directory of your boot disk.

With the driver software already installed, your only remaining setup task is to tell your communications program the device name (dl2000.device) and unit number to use. Most commercial terminal programs such as A-Talk III (Oxxi), Baud Bandit (Progressive Peripherals), and Online! Professional (Micro-Systems Software) have menu options or icon ►

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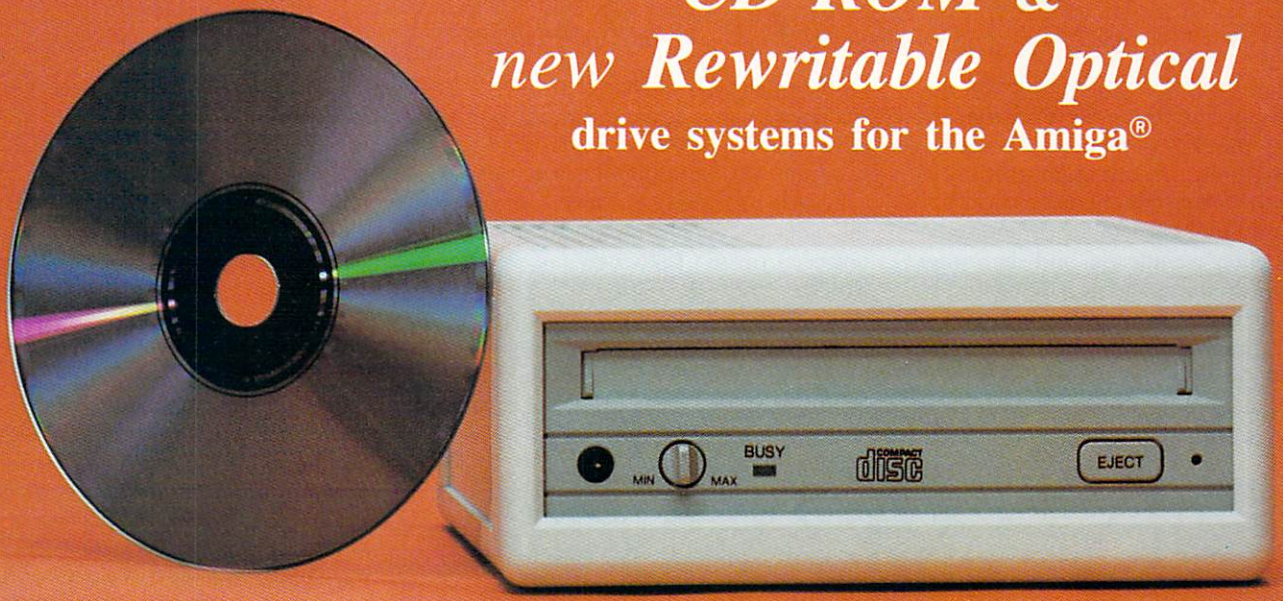

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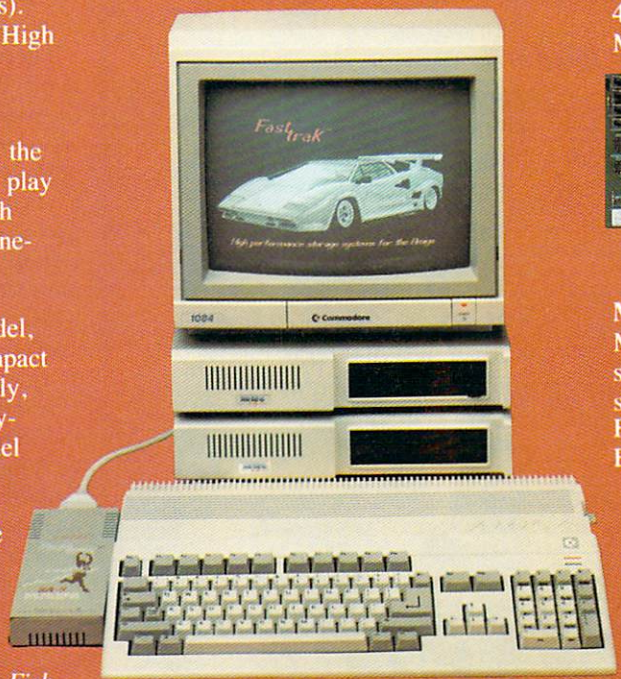

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ToolTypes that allow you to specify a device and unit number other than the standard unit 0 of serial.device. Using such programs, you can operate up to five internal DataLink modems at once, using unit numbers 1 to 5.

Many older commercial and shareware programs do not make provisions for alternate serial devices, but you can use some of these programs with a single DataLink; just use the included AESetModem program to change the serial.device name in the program code to dl2000.device (a version of the shareware program AZComm that includes this change is provided). However, some of the older terminal programs that have not been revised lately may not work with the DL2000.

I Want My MNP

Once you have set your terminal software properly, the DL2000 acts as any Hayes-compatible 2400-baud modem. For $30 more, however, you can add a level-5 implementation of the Microcom Networking Protocol (MNP-5 for short) in the form of a chip that plugs into the board. When you use the board to communicate with a remote system that also has MNP-5 capabilities, this option provides both error-correction and data-compression features.

Error correction means that telephone-line noise or other interference will not result in a string of weird-looking characters, because data is checked at both ends for accuracy before anything is printed on the screen. Data compression means that information is "squeezed" before it is transmitted (so that fewer characters need to be sent over the phone lines), and then decompressed at the other end. This is the hardware equivalent of using a file-compression program like LHArc or PKZip to reduce the size of a file. Depending on the nature of the material sent, data compression can almost double the speed at which data is transmitted.

There are some things to keep in mind, though, when using MNP. First, if the modem you are communicating with is not equipped with MNP, your MNP settings may actually impede connection to the remote system or interfere with protocol transfers. For example, with certain MNP settings enabled, I could not receive files from the PeopleLink information service using the Telenet packet-switching network and the WXModem transfer protocol.

Few commercial information services use MNP modems, but many local bulletin boards do (the Courier HST modems that are popular with system operators include MNP). Of the systems that have MNP, not all support level 5, which means that they provide error correction, but not data compression. Also, MNP-5 will not produce large speed increases when transferring files that have already been compressed by some other method, such as by an archiving program.

Because most program files that you can download have already been compressed, the bottom line is that MNP-5 is useful mainly for speeding up text transmission and screening out spurious char- ►

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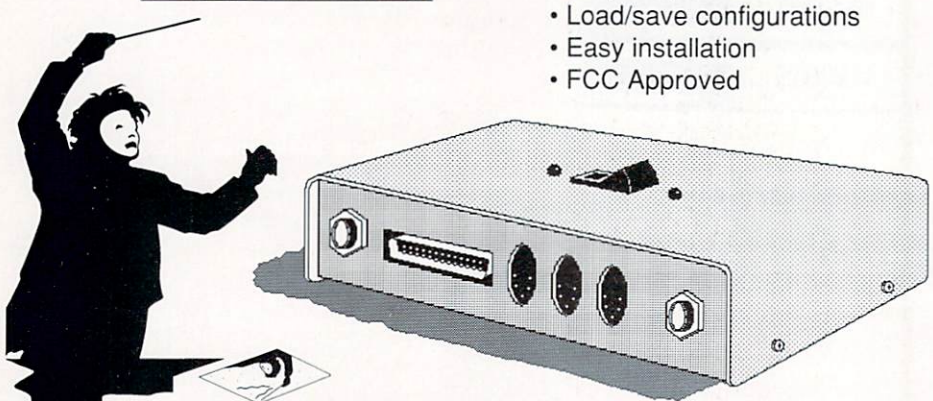

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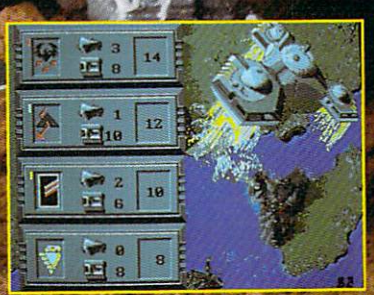

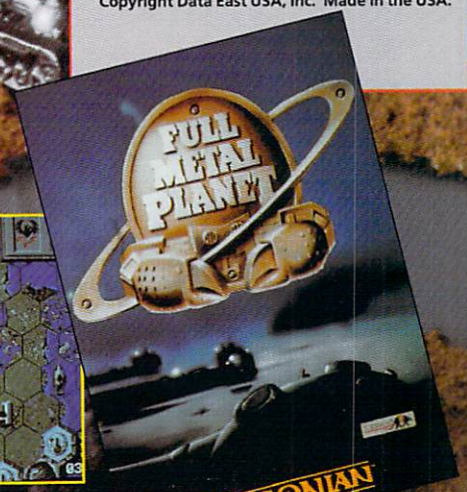

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acters. It is a nice option to have, but you will generally want to turn it off when using systems that do not support it.

Another option, due to be available for the DL2000 by the time you read this, is Send-Fax. According to Applied, this $39 hardware/software option will allow DataLink to send (but not receive) fax messages to any level-3 fax machine at a speed of 4800 bps (baud per second). The software includes a Preferences-level driver that lets you "print" a document to the fax modem from a word processor, as well as software for transmitting text and graphics directly from the screen.

It is also slated to include a phone book for storing fax numbers and a distribution list for automatically sending the same message to a number of fax machines. Although the fax option will restrict you to sending at 4800 bps initially, Applied Engineering plans to offer two upgrades: a 9600 bps rate and message reception.

HOLD THE LINE

In operation, the DL2000 performed with few problems other than the inevitable confusion of trying to match software settings to the modem hardware (though the speaker did not work on one of the two units Applied Engineering sent for review). The modem driver software did not exhibit any of the problems I experienced previously with the Supra 2400zi internal modem when uploading to CompuServe from Online! Professional, using the Quick B protocol. On the other hand, Online! Pro's redial option did not work with that program's default initialization string; when I changed the string, it worked fine. I also found some quirks in trying to use commercial packet-switching networks with all of the MNP options turned on. When I changed the modem settings back to the Hayes standard, these problems vanished.

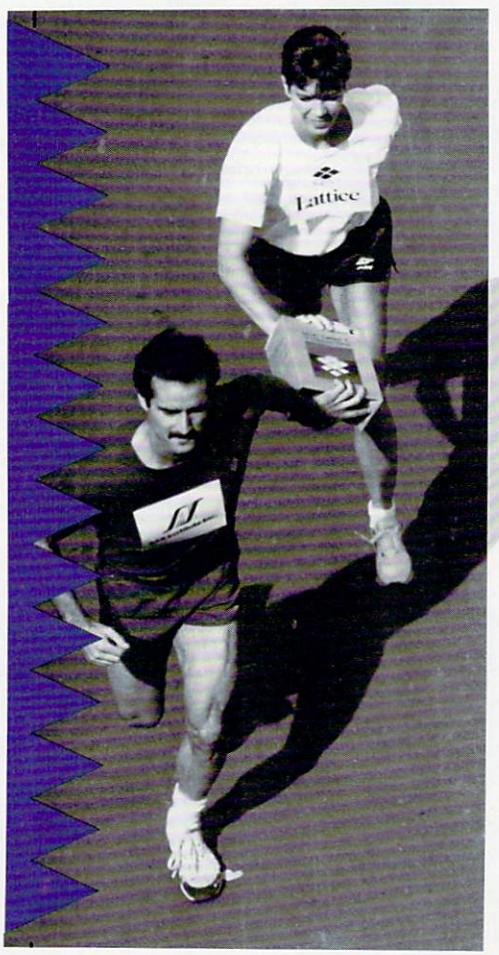
Although the Applied Engineering technical-support people were friendly and helpful, I still had to figure out most of my settings by trial and error. (The fact that the manual lists a wrong number for technical support didn't help.) As with most manuals for modems, DataLink's contains a complete description of the modem's command set, but little in the way of practical explanation. For example, it describes the features of MNP without telling you which boards are most likely to support it, which transfer ►

YOUR TURN!

DataLink 2000 was easy to install, and the instructions are good. Applied put a program on the disk that I can run with my favorite telecommunications program, Access, so that Access will look internally instead of to the serial port. I think that option is really great, and it works just fine.

I've never seen a manual for a modem that's as good as this one. There's stuff in it that I'll probably never use, but I'm glad to know it's there. I have the MNP-5 option, but I haven't used it because I'm on CompuServe, which doesn't support it. I've already ordered the fax option, too. I'm pretty satisfied. . .you can't beat the five-year warranty!

Kathy Kolb
Williamsport, PA



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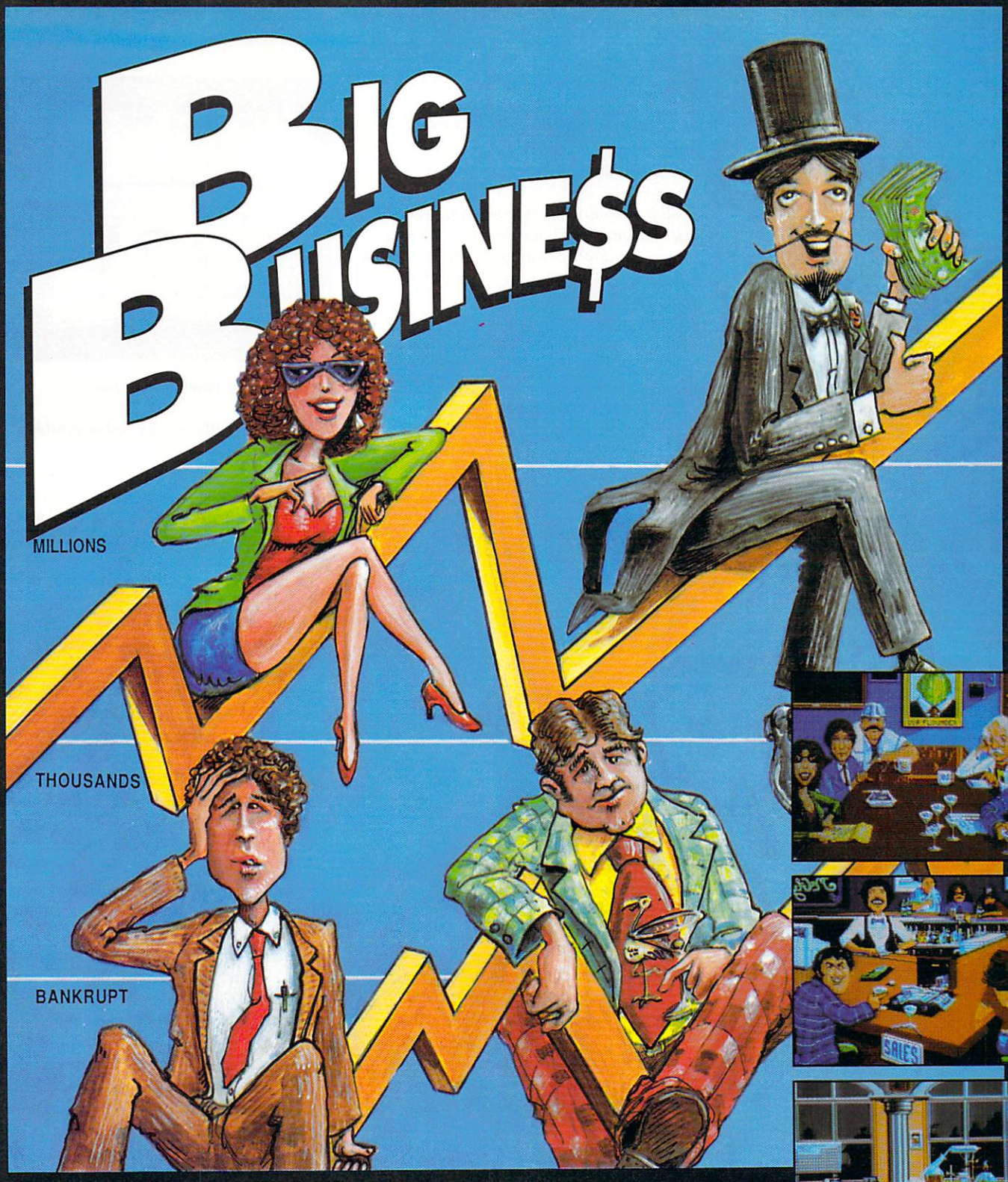

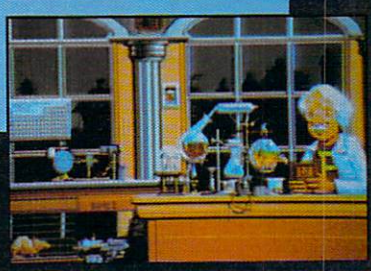

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protocols to use with it, and what kinds of problems you might run into when using the MNP settings. Neither did I see any speedy replies to the questions posed by Amiga owners on the Applied Engineering BBS.

Still, I would rate Applied Engineering's support as about average in a field that is admittedly complex. The fact that the DataLink 2000 comes with a five-year warranty demonstrates a strong commitment to standing behind the product. And the fact that Applied Engineering has developed an Amiga-specific modem (and potentially a fax product as well) speaks well of their new-found commitment to the Amiga.

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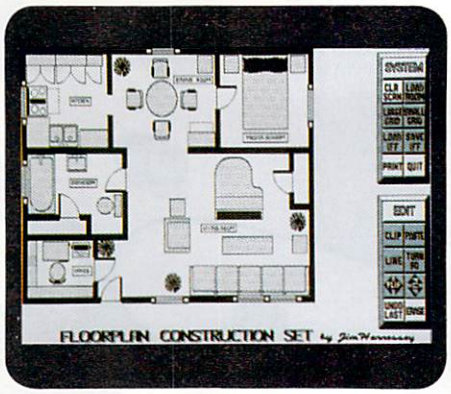
By Gary V. Fields

FLO/FLOOR PLAN Construction Set can help you resolve trying difficulties such as whether or not there will be enough room for both your desk and pool table in your new den, or where your office or home furniture should go so you can easily direct the movers. Using the program's simple clip-and-paste feature, FLO helps you arrange furniture electronically with two screen displays, one for design surfaces (in hi-res, black-and-white images) and another for images to be clipped.

You select features such as clip, paste, rotate, erase, print, and load IFF from a row of icons. Other more complex operations, such as "clip from the design screen" are available from the pull-down menus. Most features, but not all, can be selected from the keyboard, as well. The two-disk set holds several rooms—including bedroom, living room, office, kitchen, rec room, and utility—each



Rearrange your furniture with FLO.

packed with different furnishings (desk, tables, typewriters, table saws, sinks, doors, windows, walls, potted plants, and so forth). So, regardless of what you plan to build or furnish, constructing an accurate facsimile is relatively simple and painless with FLO.

Because of the program's name and packaging, I assumed FLO was a bargain-priced, architectural CAD (computer-aided design) program. Instead, it is a specialized paint program utilizing hi-res bitmap images, not traditional structured CAD drawings—and it has only a limited number of features. Anyone looking for the power of a professional drafting program will be disappointed with FLO, as it will not let you design a true-to-scale blueprint.

Getting over my initial disappointment, however, I must confess that the program does very well what it was designed to do: plan and design home and office interiors. It probably would be most effective when used in conjunction with your favorite full-scale paint program.

Although FLO itself operates much like a conventional paint program, it has too few features to be compared with the more powerful (and more expensive) ones. It saves standard IFF files and will load those created by other paint programs, providing they were created on a hi-res screen with two colors and include ".FCSpic" as an extension to their filenames. When I tried to load a standard DeluxePaint III image using four colors, the program responded with a full-blown guru alert.

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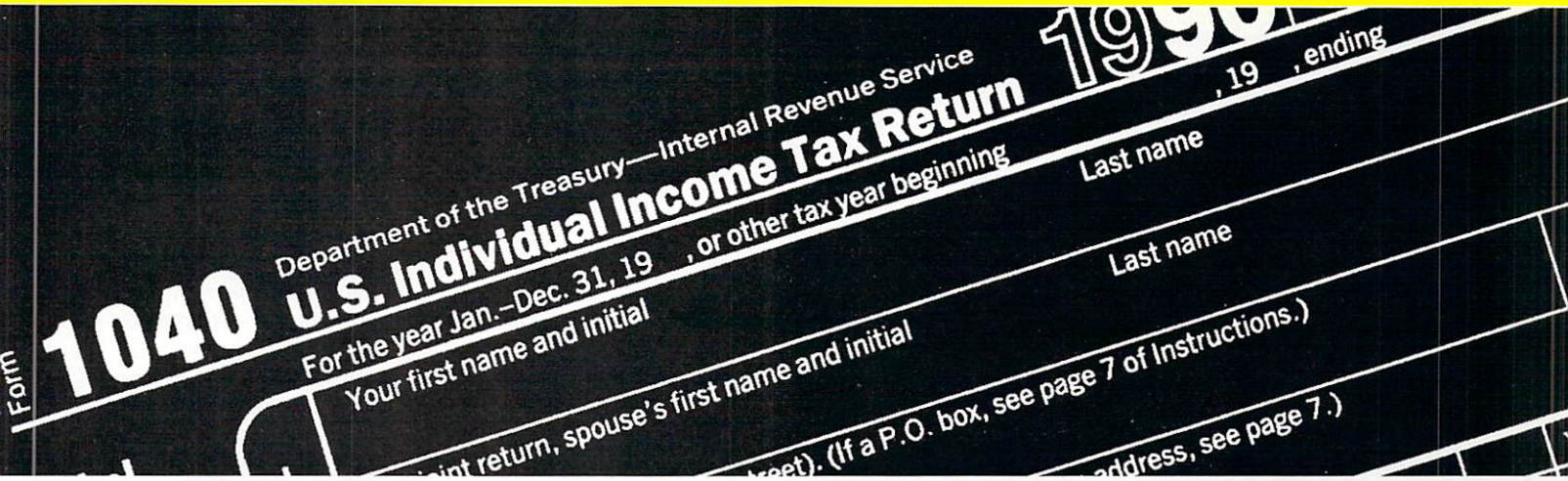

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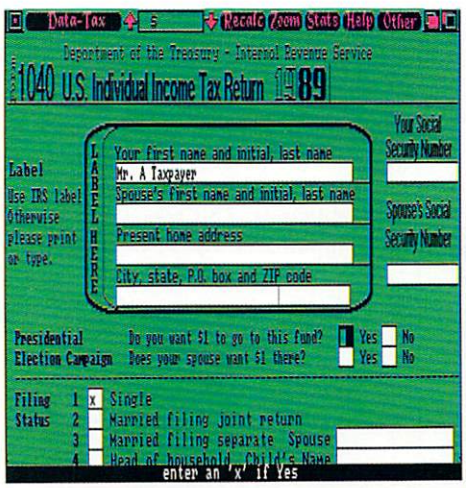

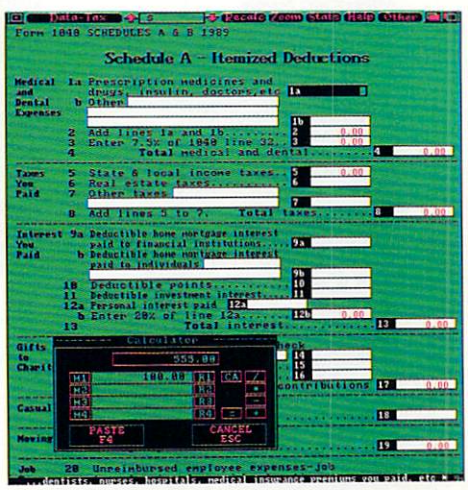

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YOUR TURN!

FLO is not very sophisticated, but it's great for the price. We used it when we built an addition on the house, and it was really nice for setting up. The program was great for getting things to scale; then we could print the results and take it to the builders. The first version had some problems, but Gramma Software replaced my disk right away. They were really nice.

Steve Latham
Gadsden, AL

images: walls, office, bedrooms, shops, and provisions for features accommodating the handicapped. They are all well done and the rooms come in both full and 1/4 scale. If you own a standard paint program, you may want to use FLO to clip, paste, and save your data images as IFF screens, and then load them into the paint program to design your floor plans. One clearly superior feature is that, unlike some paint programs, FLO rotates clips without distorting their proportions.

The program, however, is neither fast nor flexible. For example, there is no simple way to construct other home or office furnishings, and you can rotate the ones included only in 90-degree increments. Also, there is no text mode, so adding notes to your design is impossible (although you *can* clip and paste the text labels found in the room screens).

Unfortunately, it is easy to outpace the program while inputting mouse or key commands. This speed disadvantage is compounded by the fact that commands are held in the computer's buffer and executed in sequence. This can result in the program executing repetitive commands—or appearing to lock up—simply because you may click on an icon several times in trying to get it to activate without realizing that the program was still processing the first chore. It is true that command buffers can sometimes be helpful, but I have found that to be the exception rather than the rule. I'd prefer FLO to do a key buffer dump after each operation to avoid repetitive errors.

WISH LIST

FLO is far from the perfect planning or designing tool. Its lack of four important features prevent me from recommending it without reservation. A text mode, a magnify mode, a snap-to-grid option, and an input buffer dump would make a lot of difference.

With that said, let's remember that the program retails for $80. Professional paint and CAD programs can cost many times that amount. In my opinion, the clip data alone is worth the asking price, even if you only convert them for use with another paint program. FLO/Floor Plan Construction Set is a planning tool and nothing more. As long as you buy it to use only for that purpose, and not for painting or drafting, you should be happy with your investment.

FLO/Floor Plan Construction Set
Gramma Software
17730 15th Ave. NE, Suite 223
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No special requirements

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ABCgames (Parth Galen)
AdSCSI 2000 with Q40S (ICD)
Advantage (Gold Disk)
A-Max II (ReadySoft)
Elan Performer 2.0 (Elan Design)
Home Front (Designing Minds)
MicroTrader 4.0 (MicroActive)
Office (Gold Disk)
Sterling Service BBS (Free Spirit)
Top Form (Designing Minds)
VidControl (Integral Systems)

To comment on these, write us (Your Turn, *AmigaWorld* Editorial, 80 Elm St., Peterborough, NH 03458) or call (800/441-4403, ext. 156) by Dec. 19, 1990. Write or call at any time concerning other new releases. ■

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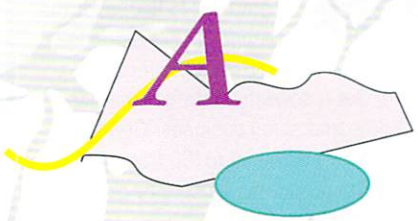

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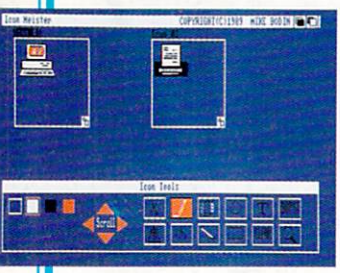

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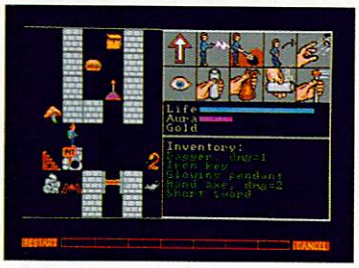

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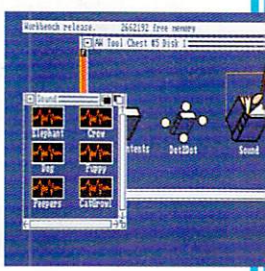

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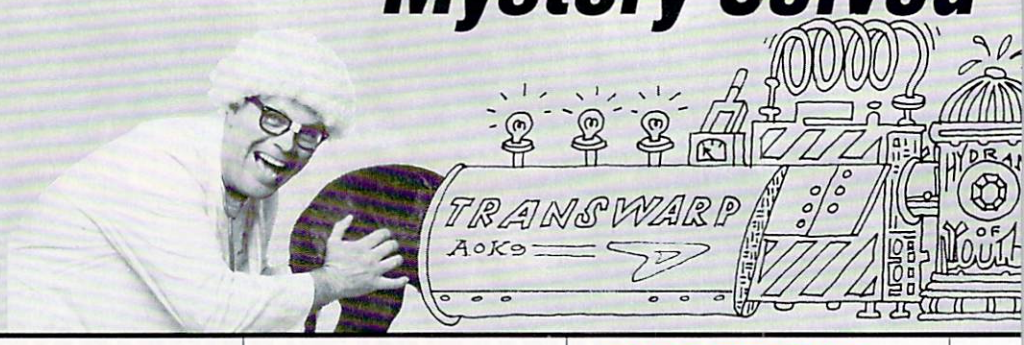

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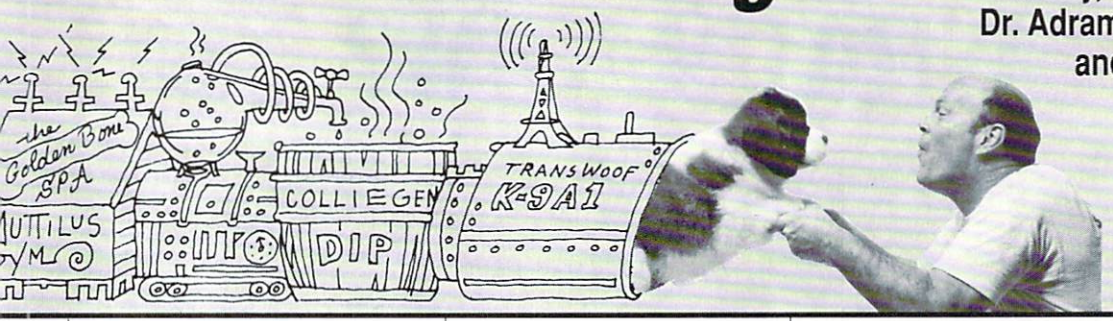

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WHAT'S NEW?

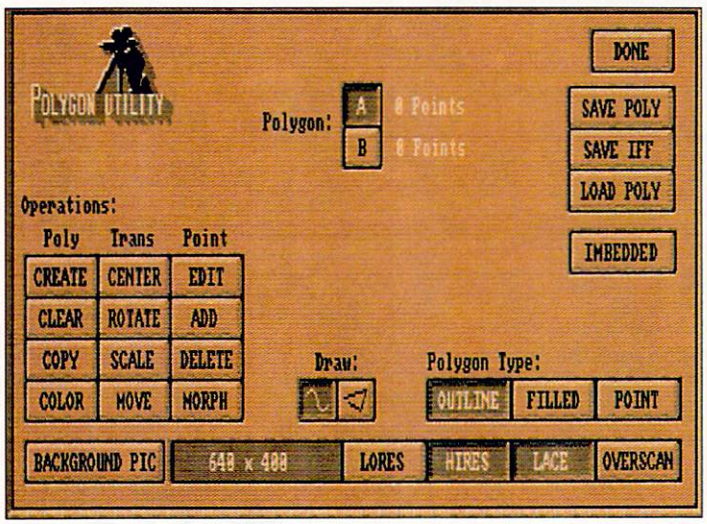
Ring in the New Year with the latest in Amiga hardware and software products.

Compiled by John Wolfskill

AUTHOR! AUTHOR!

DOES THE RIGHT Answers Group have the answer? **The Director Version 2** ($129.95) comes with enough new features and enhancements to fill a Greyhound bus. The animation and multimedia presentation package now operates from its own script editor with pulldown menus, and it provides customizable function keys as well as a built-in IFF file viewer. New animation features include automatic double buffering, background ANIM and IFF file loading, palette crossfades, sprite animation, polygon rotation, morphing, and more.

In the sound department, there's a new SMUS module with stereo sound and the ability to play back large sound samples in Fast RAM. The Director's scripting language also has undergone a face-lift. Director Version 2 allows you to use 16-character filenames, sports seven new commands, and provides full ARexx support. An upgrade for Director 1 users is available for $60, plus $10 postage and handling. (The Right Answers Group, Box 3699, Torrance, CA 90510, 213/325-1311.) *RS# 504.*



New with Director 2 is a polygon utility.

TRUE 24-BIT COLOR: THAT'S NOT HAM

THAT'S WHAT THE people at M.A.S.T are saying these days. The company recently unveiled **Colorburst** ($495), a pass-through hardware device that attaches to the RGB video port of any Amiga to provide 24-bit color graphics in 16 million colors. You can combine Amiga graphics with Colorburst's output on the same screen and set each pixel to a different and independent color. Colorburst supports overscan, interlace, and non-interlaced screens, and it provides NTSC and PAL broadcast-quality video output to drive your favorite genlocker. Palette-mapped displays also allow software to adjust white balance, do palette fades, and perform other special video effects. (M.A.S.T., 1395 Gregg St., Sparks, NV 84931, 702/359-0444.) *RS# 505.*

DESKTOP VIDEO TO GO

VIDEOMASTER VM-2 ($1295) provides Amiga video professionals with a genlock, video switcher, and special effects generator in a single box. The external unit combines Amiga graphics with an external video source (Composite, S-VHS, Hi-8 , or Ed Beta) and comes with an automatic RGB splitter. The compact unit's special-effects generator produces horizontal, vertical, circle, and inverted wipes, which can be automatically timed, or controlled manually.

VideoMaster generates its own vertical synchronization signal for recording Amiga graphics when no external video-reference signal is available. You can also use its built-in, key-out signal to drive a production mixer. The internal video switcher provides noise-free vertical interval switching between the Amiga and external video inputs. VideoMaster VM-2 is available in both NTSC (RS-170A) and PAL versions. (VidTech International, Inc., 2822 NW 79th Ave., Miami, FL 33122, 305/477-2228.) *RS# 506.*

AND THEN SOME

GOLD DISK NOW offers upgrades for three of its most popular software packages. A significant improvement to **Professional Page 2.0** ($395) is the Pantone Matching System (PMS) that provides industry-standard color reproduction for desktop publishers. Other new features include a built-in word processor with a 90,000-word spelling checker, text and graphics rotation, style and paragraph tagging, 24-bit color support, automatic page numbering, word-spacing controls, and a video tutorial.

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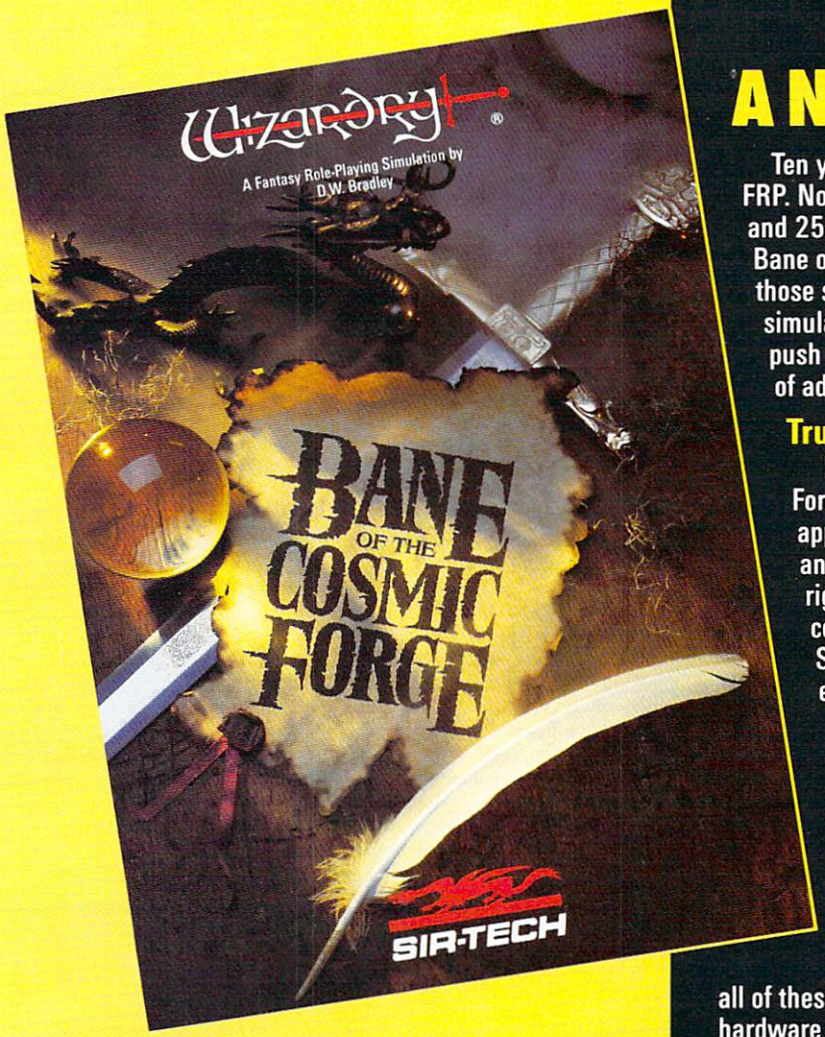

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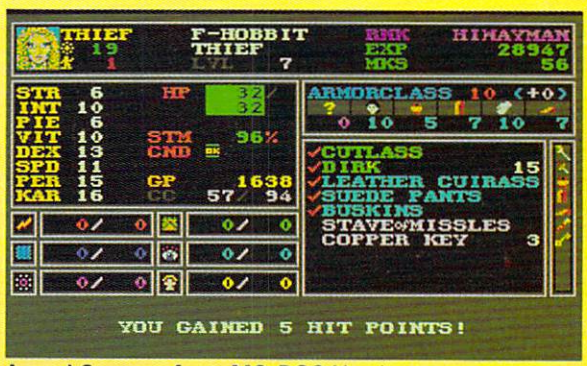

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vides 37 new spreadsheet functions and enhanced Lotus 1-2-3 compatibility. Numbers are now stored and displayed with 13 digits of precision for greater accuracy. The company claims math calculations are 40% faster, and worksheets load and save up to 80% faster. Advantage 1.1 now also supports Motorola 68881 and 68882 math coprocessors. In addition, a new feature allows you to execute ARexx scripts automatically when a spreadsheet loads.

To cap a host of improvements, Gold Disk's word processing package (formerly called Transcript) now sports a new moniker—**TransWrite**. It offers custom screens and variable screen colors, allows you to load and save configuration files, and is now compatible with Workbench 2.0. Other goodies include a spelling checker, file encryption and decryption, multiple search-and-replace, the ability to save printer settings with a file, and a more intuitive interface. (Gold Disk, 5155 Spectrum Way, Unit 5, Mississauga, Ont., Canada L4W 5A1, 416/602-4000.) *RS# 507.*

Flicker Free Video ($499.95) is the first flicker-free video card to work with all A500, 1000, and 2000 PCs. The small, multi-layer card works with a standard IBM VGA or multifrequency monitor to eliminate interlace flicker and visible raster scan lines. The board requires no soldering or heavy technical knowledge to install, and it doesn't occupy the A2000's video slot. Both PAL and NTSC video signals are automatically recognized by the card. The board relies on three megabits of onboard RAM to provide full overscan screens as large as the Amiga can produce. (ICD Inc., 1220 Rock St., Rockford, IL 61101, 815/968-2228.) *RS# 508.*

Applied Engineering now offers the **DataLink Express** ($159), a 4800/2400 bps modem that supports optional MNP-5 error correction, Bell 103 and 212 protocols, and European CCITT V.22 BIS,V.21 and V.22 standards. A combination hardware and software upgrade called AE Send-Fax allows you to use the DataLink Express as a send-fax modem. Now you can send text and graphics directly from your Amiga's screen to any fax machine. The unit comes with a five-year limited warranty and free communications software. (Applied Engineering, PO Box 5100, Carrollton, TX 75022, 214/241-6060.) *RS# 509.*

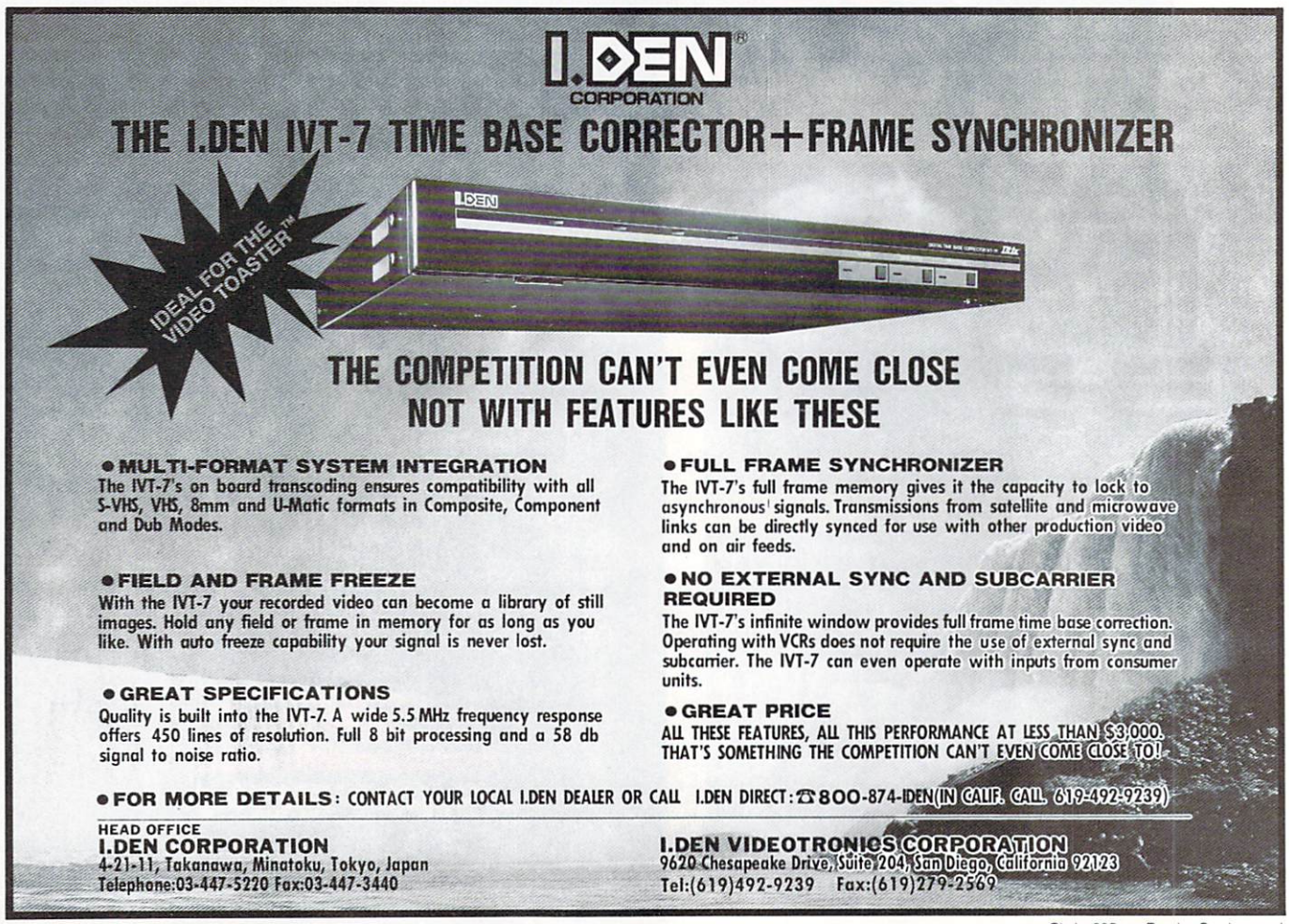
Oxxi, Inc. and noted Amiga artist Jim Sachs have combined forces to offer the **Jim Sachs Signature Collection 1991 Calendar**, a collection of 14 stunning computer-generated graphic images. The calendar includes Sach's favorite works, along with a treasure trove of tips for aspiring Amiga artists. (Contact your local Amiga dealer or Oxxi, Inc., 1339 E. 28th St., Long Beach, CA 80806, 213/427-1227.) *RS# 510.*

Who says desktop publishing has to be a serious matter? Not the people at Pelican Software. Billed as the "Lighthearted publishing program," **Pelican Press** ($99.95) is an easy-to-use printing program that lets you create giant posters, newsletters, cards, and even your own custom wrapping paper. The package includes a full-featured paint program and a great selection of professionally rendered clipart. A school version is also available for $119.95. (Pelican Software, 338 Commerce Drive, Fairfield, CT 06430, 800/232-2224.) *RS# 511.*

Free Spirit Software now offers the **Sterling Service BBS** ($149.95), which it calls the "Friendly BBS." According to the company, it's the first BBS system for the Amiga to provide an easy-to-use graphical user interface. It offers six user clubs, with up to eight sections each, ANSI and ANSI-extended color graphics, online menus and help, sysop remote CLI access, and an optional on-line screen editor. You can attach files to E-Mail messages and view a file prior to downloading. (Free Spirit Software, PO Box 128, 58 Noble St., Kutztown, PA 19530, 215/683-5609.) *RS# 513.*

AMKIT 2.0: An Introduction to the Workbench and CLI ($49.95) is a new version of International Technologies' tutorial system previously available for AmigaDOS 1.3. The new kit comes with a well-organized manual and three disks designed to help you over the hump with all that AmigaDOS 2.0 offers. The disks also contain over 30 fully documented public-domain programs. (International Technologies, 2302 D Ave., Suite 203, National City, CA 92050, 619/477-2024.) *RS# 512.*

Gain better control over your DeskJet (Hewlett-Packard) printer with **DJHelper** ($50). DJHelper offers improved control over positioning of graphics, page dimensions, and gray-scale manipulation, as well as providing binary editing in both Hex and ASCII and direct selection of typeface, character, and set. You customize your printer's output to define the typeface as pica, elite, fine, or enlarged. Or, if you wish, you can replace Amiga command codes with your own definitions or edit and transmit any printer-control sequence. (Creative Focus, Box 580, Chenango Bridge, NY 13745, 607/648-4082.) *RS# 514.* ■



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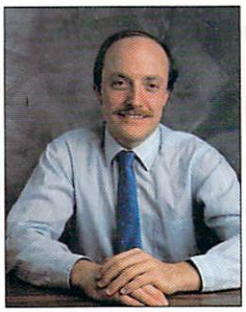

Discover what's hot on the nets this month.

Compiled by Tim Walsh

As winter really digs in, the Prospector is scanning the telecommunications networks, seeking to bring you a constant variety of download selections. As always, file numbers and library locations are listed for quick reference.

People/Link

JRC101.LZH (AmigaZone Section 8, File# 24972) The popular JR-Comm telecommunications program, upgraded to version 1.01. Offers Workbench 2.0 compatibility.

LHARCA99D.LZH (AmigaZone Section 4, File #24943) LharcA99D, a point and click interface for the Lharc archiving program. Also permits selective extraction of a particular file within a compressed file.

MACHIII.LZH (AmigaZone Section 4, File #24854) MachIII and SetMach combo. Provides mouse speed-up and hot keys.

WONDERSOUND1.5.LZH (AmigaZone Section 7, File #24804) Version 1.5 of WonderSound. Creates all manner of strange and unusual IFF sound files.

Kudos to Plink's Amiga section Chairman Harv Laser for uploading files #24980 and #24981 to Section 5. These 4-in-1 HAM pictures include *AmigaWorld* editors at the October 1990 AmiExpo.

CompuServe

JOY.LZH (AmigaTech, Library 1) Control your Amiga with a joystick plugged into port 2. Handy if the mouse dies or its port goes belly-up.

TEXTCA.LZH (AmigaUser, Library 7) An editor that performs math functions on two or more numbers in a document.

FIND.ZOO (AmigaUser, Library 9) Quickly locates files on a hard disk. Operates with Workbench 2.0.

RECOVE.LZH (AmigaUser, Library 9) Recover II disk-salvage program with an Intuition interface. Reads a device and lists deleted but recoverable files.

CompuServe Assistant Sysop Betty Clay says the network is alive with the sound of A64DIS.LZH, found in Library 15. It's a Commodore 64 emulator that runs most C-64 software. Send the author $25 for a cable that lets you attach a 1541/71/81 to the Amiga and use it with the emulator.

GEnie

RUNIT!11.LZH (Library 4, File #9356) Intuition-based interface that executes double-clicked program files. Shareware, but only one dollar!

DIRWORKS_V1.12.Z00 (Library 4, File #9345) Version 1.12 of DirWorks, a handy file-maintenance utility. Shareware, $20.00.

DU.LZH (Library 4, File #9344) Version 1.4 of du. A tiny (1640 bytes) disk utility that displays the disk usage of files and directories.

ICONIZE_V090.LZH (Library 13, File #9337) Converts IFF images into gray-scale icons for your Workbench screen. Can be used with either Workbench 2.0 or 1.3.

All of the fine GEnie files listed above notwithstanding, RRAM.LZH (Library 11, file #9330) has the highest number of downloads of any GEnie file recently. It's a 6300-byte file that creates up to 32 recoverable RAM disks at once!

Prospector's Perch: Disk utilities and keeping up with the (Dow) Joneses

After examining the above listings of top picks from the networks, it's clear that short, useful disk utilities are gaining in popularity. Attribute it to the increase in hard disk-equipped Amiga systems, the recessive economy, or a combination of elements, but something is keeping programmers at home writing decent code.

If you're uncertain of whether or not you want to establish an account on a network or two, there are some rarely mentioned advantages. Downloading utilities and applications is fine, but networks also serve as invaluable sources of up-to-the-minute news. While a five-dollar transistor AM radio does the same, networks such as CompuServe and GEnie provide up-to-the-hour NYSE prices. If you're worried about Wall Street fluctuations and can withstand about eight anxiety attacks per day, get one of these accounts. Besides a modem, all your computer needs is a telecommunications package, such as the top-notch JR-Comm program listed above.

As always, bear in mind that few files listed under one network can't be found on the others. Sure, there are exceptions to every rule, but, given time, nearly all the freely distributable files make the rounds to all of the nets. For example, IIZE09.LZH, found on CompuServe, is the same program as ICONIZE_V090.LZH, listed above under GEnie.

If all else fails, and a specific file can't be found on your network, check out the public-domain disk collections advertised throughout *AmigaWorld*. Another quick remedy is to contact your local Amiga dealer for other sources of freely distributable software.

If you're interested in establishing an account on any of the above networks, here are the voice numbers to call to get under way:

American People/Link: 800/524-0100
CompuServe: 800/848-8199
614/457-8650 from within Ohio
GEnie: 800/638-9636

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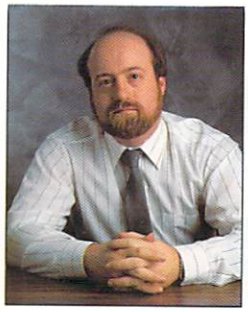

HELP KEY

Just when you are attaching the chain to turn your Amiga into a boat anchor, along comes Lou.

By Louis R. Wallace

X Lost the Spot

Q: *Help! I just had a weird thing happen to me using Workbench 1.3. I started with a drawer (call it drawer X) that contained another drawer (call it Y). I opened drawer X, and its window showed that drawer Y was inside. Next, I opened drawer Y. I closed drawer X and then dragged drawer X inside of drawer Y. Finally, I closed drawer Y, and both drawers disappeared! They never show up anymore on my directory. They never even write or call. What happened?*

M. Joiner
Sebastopol, CA

A: Well, you have encountered a rather obscure bug in AmigaDOS. I tried what you described, and both of my directories also went off to never-never land. I called Commodore's technical department, and the representative I spoke to confirmed that they are already aware of this bug.

If you lost important data in those directories, the only advice I can give you is to use a program such as DiskSalv (a PD file/disk recovery program) to try to restore your files. However, if you have written to the disk that the directories were on, the data may already have been damaged or destroyed. Oh yes, one more tiny bit of advice: I suggest you don't try such drawer gymnastics anymore!

DOC Squawk

Q: *I just bought a Trumpcard 500 and an ST138N hard disk in order to store all the programs I have in one place and to solve my floppy overload problem. The combination seems to be working just fine, and, as an artist, I love being able to load DeluxePaint III in two seconds. I am not a hacker, however, and have only a minimal amount of knowledge of the CLI, so I prefer to handle CLI functions with such programs as Click-Dos, Browser, and UtiliMaster because they are faster and easier for me than learning the CLI.*

The problem I am having is with the .DOC files for some of my programs. When I booted with a floppy, they would run and display their information just fine when clicked. Now, however, many of them either flash a 205 error or ask me to insert a certain disk. What did I do wrong when I installed my hard disk? Do I need some kind of assign or something for the .DOC files?

R. Corcoran
Wauconda, WA

A: I suspect the problem lies in the command and path that are named in the Default Tool field of the icon. To find out, click on the icon once. Then, from the Workbench menu select Info. This will display a screen with a number of facts about the icon, including which (if any) default tool is to be used.

The chances are quite good that the icon is using a default tool such as MORE (or another text file reader/display program), and may even specify the volume name of the program's original disk. If this is the case, you can edit the default tool to direct it to your own AmigaDOS C: or Utilities: directories. Depending on where you keep MORE (I moved mine into the C: directory, while other users keep it in the Utilities: directory), edit the information in the Default Tool field to contain:

```
SYS:C/MORE
```

or

```
SYS:UTILITIES/MORE
```

Finally, click on the Save gadget. The next time you click on the icon for the documentation file, it will be able to find the proper file-reading program.

Stop the Swap

Q: *I have an A2000, and I use the word processor excellence! Every time I try to save a file to my formatted data disk, the computer asks me to reinsert the program disk (excellence!) and ends up saving the file to that disk instead of my blank data disk! What's wrong?*

P. Gong
Kerman, CA

A: From the scenario you describe, I have to guess that you are working on a computer with only one floppy drive. If that is the case, you can do a couple of things to make excellence! save files as you wish.

If you have enough memory, you can create a RAM disk and modify your excellence! disk's startup-sequence to copy the program to RAM:; then run it from there. The easier choice, however, would probably be to merely enter a filename in the Save File Requester that includes a path to your data disk. For example, if you formatted your data disk with the name Data, you could tell excellence! to save your file, MyDataFile, to the destination disk, Data. As in:

```
Data:MyDataFile
```

When you try to save with the above name, you will get a message instructing you to insert the disk named Data. Swap disks, and the save should proceed smoothly.

The best, but most expensive, solution to your problem is to buy a second floppy drive. You will find this makes using nearly every productivity program (and quite a few games) a lot easier. ■

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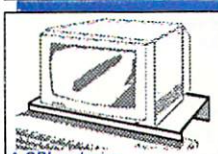

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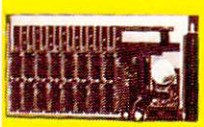

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AMIGA WORLD

Index to 1990 Articles and Reviews

Editor's note: Individual entries in the Index are presented alphabetically under two major headings: Articles/Columns and Reviews. Articles/Columns are organized alphabetically under the following subject categories:

- Games
- Graphics/Animation
- Hardware: Systems/Expansion/Peripherals
- Lists/Buyers' Advice
- Multimedia/Authoring Systems
- Music/Sound
- Operating System/Workbench
- Productivity/Business
- Programming
- PD/Shareware
- Telecommunications/Networking
- Video

Reviews are organized under the categories Hardware, Software and Games.
The Index covers all 12 regular 1990 issues of AmigaWorld *plus the* 1990 Video & Animation Special Issue *(abbreviated SI in individual entries).*

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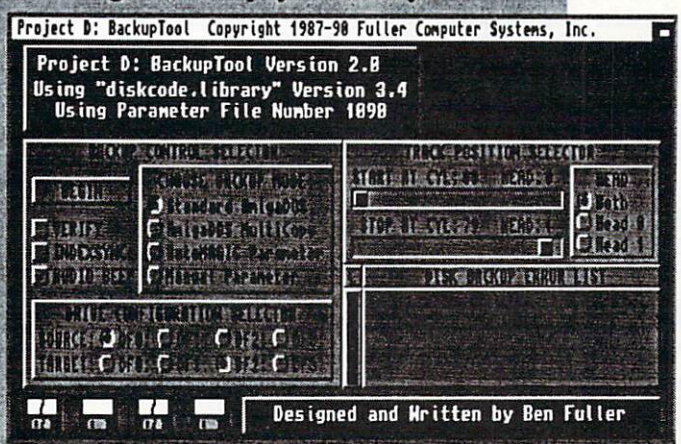

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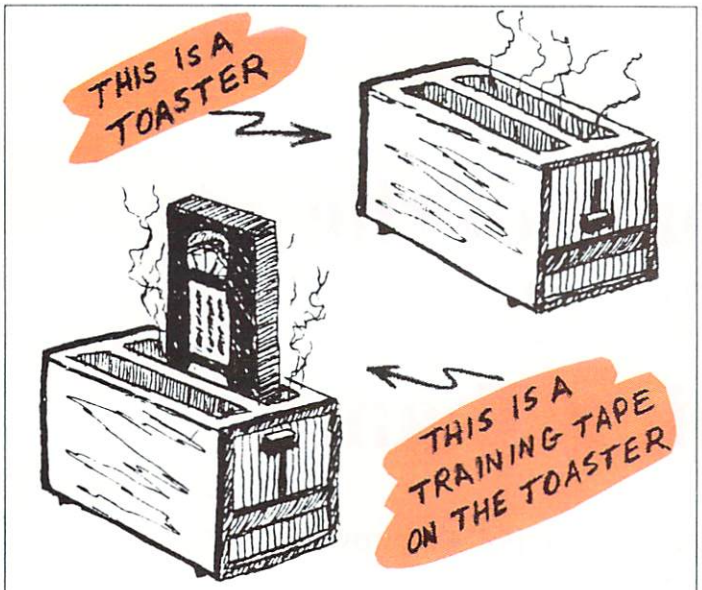

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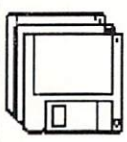

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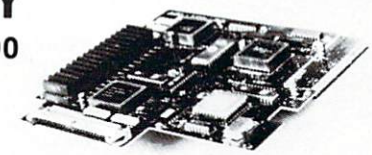

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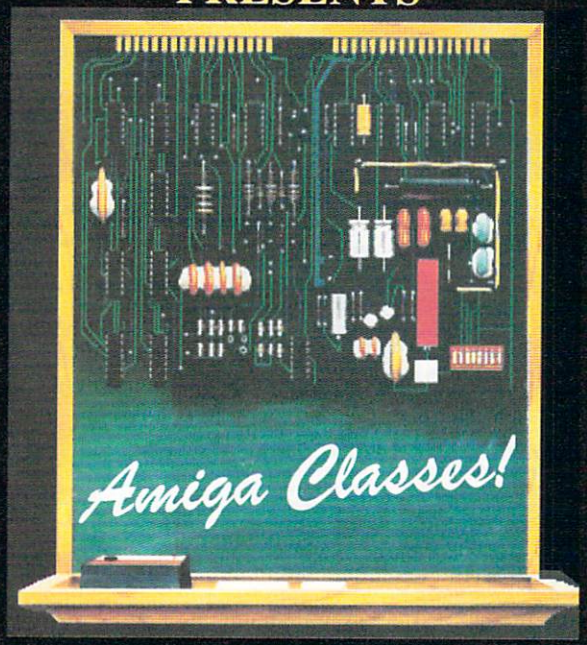

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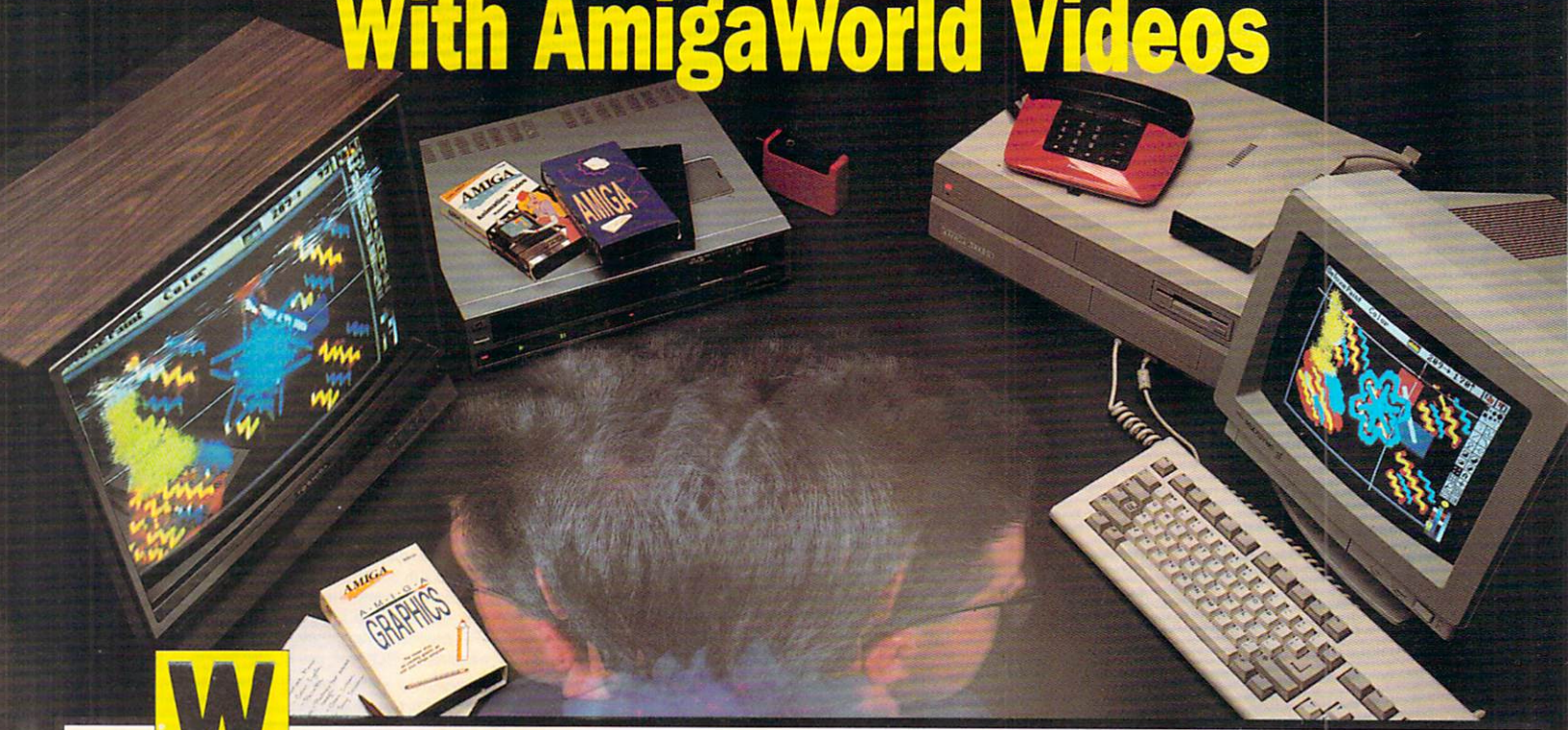

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From a simple tune to a full concert—the Amiga can help you do it all. This extraordinary video shows you what you need to get started and how to play music with existing software. You'll learn the best ways to sample sounds and manipulate sampled sound to produce dazzling special effects. And if you want to learn more about using a MIDI, this is the video that can help. It explores the uses of MIDI and gives you valuable ideas from some of the best Amiga musicians in the country.

AMIGA GRAPHICS, Volume I

You'll be amazed at how fast you'll be producing excellent art. This hour-long video adventure explores the full capabilities of Amiga art. It delves into computer painting...discusses the pros and cons of the most popular paint programs...tells you when HAM is a good idea...shows you how interlace works...and describes smearing, washing and tinting. Plus you get three extensive sessions on fonts, clip art and even digitizing!

DESKTOP VIDEO

Business presentations, instructional videos and even home movies—this exciting video shows how you can use video with your Amiga. You'll gain valuable insights into evaluating Genlocks, using your camera with professional results, developing effective production operations, creating terrific special effects, adding animation and more. It's a video you won't want to miss!

GETTING STARTED WITH YOUR AMIGA

There's no easier way to master the basics...and some of the more sophisticated operations as well. In a lively and easy-to-follow format, this video starts with assembling your system, feeling comfortable about working with screens, icons, and windows, and becoming a wiz at Workbench. It then addresses some of the more advanced topics of working with CLI, maximizing the use of your utilities and using a modem to expand your horizons.

ANIMATION VIDEO

When the editors of AmigaWorld canvassed the Amiga community looking for the best in Amiga animation, the response was overwhelming! Replies poured in from Amiga master artists as well as super-talented readers. The result—a mind-blowing video featuring dozens of real-world animations demonstrating what's being done and what you can do. Order your copy today...it's already becoming a collector's item!

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We are the **Offical Public Domain Library of Antic Amiga Plus**, we have been the **Offical PD library of Amiga World.** Find out why these magazines choose us! Each of our disks are jam packed with nothing but the best programs. The first two letters on each disk indicate the orientation of the disk; DD# intermediate to advanced - often contains source, WB# general interest - most programs can be run from the workbench, and FD# games and entertainment. Order our disk based catalog and receive a coupon for a **FREE** volume on your next purchase. We always use only SONY disks!

Featured Disk

FD39a & b:Tobias Star Trek - This is a new, completely different version of Star Trek than that found on FD12. This one was created by the German author Tobias. Now with English instructions. Very Excellent!!! Counts as two disks. Requires 512k memory, and a 500, 2000 or Pal Amiga.

New Disks

FD41:Games - Includes Capital Gains - a stock market game, Ball a Arknoids type of clone with many great twists, and Desert Shield - a shoot'em up with a destroy and conquer theme.

FD42:Games - Includes SpaceWar3 - a remake of this original Amiga classic, Trippin - a fascinating board game of intrigue, strategy, and player manipulation, Dominion - an engrossing strategy game of galactic war and conquest, Frog - a frogger type clone, and Mines - a very challenging strategy board game.

WB66:Icons #2- Lot's of neat icons. Also, several wonderful programs that to let you create your own icons, modify and manipulate icons and info structures.

WB67:MED songs - Several .mod files (playable songs) for use with noisetracker, soundtracker, or MED. MEDplayer included.

WB68:Music Utilities - several good utilities for the Amiga music enthusiast. Includes, Noisetracker - a great music creation program, Sonix2MOD - converts sonix to .mod files which then can be used by noisetracker, soundtraker, and MED, SpeakerSim - a speaker design tool demo, Wondersound is an additive harmonic instrument design tool with a separate envelope design window and 16 relative harmonic strength and phase angle controls.

WB69: Music - This disk has over 90 minutes of classical and modern electronic music for you Amiga.

WB70:Desk Top Pub - Atcp - transfer Macintosh screen fonts, Mac or IBM format .AFM metric files, to Amiga screen fonts and PPage .metric files. With this program open door to the libraries of Adobe and PostScript type!, Calendar - month templates in PS form, Post - a full featured post script file display and print utility.

WB71:C64 Emulation - The A64 Package is a complete, very powerfull, Commodore 64 emulator.

DD71:C compiler - This disk contains Dice, Matthew Dillon's full featured, powerful C compiler and environment system.

DD72:VT Emulators - Contains three powerful, full featured vt emulators, with many advanced features including kermit, xmodem and tektronix protocols. VaxTerm, VLT, and more.

DD73:BBS - Includes three different BBS's with many advanced features. PLW, Pro-BBS, and Trans-10.

Other Great Disks -

FD5: Tactical Games - BullRun - a Civil war battle game, Metro - you play the role of a city planner. Build wisely and your system will be a success, but poor planning will lead to disaster and financial ruin. Very very habit forming.

FD6: GAMES! - This disk is chock full of games including; Checkers, Clue, Gold - A new slide the pieces puzzle, Jeopard - An enhanced version of Risk, RushHour - Surprisingly addicting, and SpaceWar - Best described as a cross between Combat-Tanks and asteroids.

FD7: PACMAN - This disk contains several pacman type games including; PacMan87, MazMan and Zonix.

FD9: Moria - This has great graphic controls, multiple spells, similar to Larn and Hack. Play time several weeks!

FD10: HackLite - A dungeon adventure game. Considered a must-have classic. This is the second release of this game on the Amiga. Great Amiga graphic interface. Play time several weeks!

FD12A,FD12B: Star Trek, The Game - This is by far the best Star Trek game ever written for any computer. It features mouse control, good graphics, digitized sound effects and great gameplay. Counts as 2 disks. Req. 1Mb and two drives (or hd).

FD13: Board Games - contains multiplayer Monopoly, Dominoes, Paranoids, and others.

FD14: Dungeon Master Hints and Arcade Games - DM maps, spells, item location, and hints and more, also on this disk, Hball - an arkanoid/breakout type game, Trix - a Qix type clone.

FD16: Strategy Games - Includes Diplomacy and Empros, both great conquer and rule multiplayer games similar in concept to Simcity and Populace. Also includes blackbox, hearts, and others.

FD17: Educational Games - This disk includes several games for the younger members including geography, math, science, and word games, also includes Wheel of Fortune.

FD20: Tactical Games - MechForce(3.72): A game that simulates combat between two or more giant, robot-like machines. Simple words can't begin to give you the feel of piloting a 30 - 40 foot tall, fire breathing, earth shaking colossus that obeys your every whim.

FD26:Arcade Games - Marble_slide, this is a truly commercial quality game. Similar to a Lucas game named PipeDreams, excellent playablity and entertainment, Mutants , a small version of the arcade game of the same name, also SuperBreakout a pong/arkanoids type game.

FD29: Shoot'em up's - WWII - you're the pilot of a WWII plane flying through enemy territory, you've just been spotted, good luck on you mission, SpKiller - try and penetrate enemy lines with this game, and Retaliator - another great game.

FD32: Game Cheats and Flight Simulator - Includes an instrument flight simulator for a DC10. Also Cheats and Hints for the following games, Earl Weaver, Falcon, It c.f.t.d., SimCity, SpaceAce, Space Quest, Test Drive hd install, and Extract, a program that gets all of the text from within a game (or other) which makes cheating easier. Also several football teams (.team files).

FD33: Arcade Games - Ffreddy a mario brothers type of game, Gerbils a target practice game, PipeLine a German interpretation of Pipe Dreams, Tron a light cycles version, and wetroids a wonderful version of asteroids with a hilarious twist.

FD35 Omega (v 1.3) - A new dungeon and outdoors adventure game in a similar vein as hack, rouge, and moria. This version is considerably faster and better than all previous versions. Play time, months.

FD37a & b:Tactical Games - Empire (2.2w) This game comes highly recommended. Now with a full-featured graphic front end. Empire is a rich simulation of international politics, economics and war, which is played over a period of a few of months by 2 or more people. Players can run their countries from the normal Amiga keyboard, or via a modem at 300 to 2400 baud. Counts as two disks.

FD38:Games - Cribbage Master - A great cribbage game and tutor, Spades - a well done card came, ChineseCheckers - A computer version of this classic, Puzz - a slide piece puzzle game and construction set.

FD40:Arcade - MiddleEast - a timely arcade game of death and destruction set in Iraq, BackToTheFuturell - a very playable demo version of this soon to be released commercial game, City - a missile command clone.

WB4:Telecommumnication - This disk contains several excellent pd communication programs designed to get you on line quickly and easily, Access (1.42) - A very nice ANSI term program based on Comm v1.34, but with the addition of transfer protocols, Comm (1.34) - Last version of one of the best public domain communications programs ever made on the Amiga, Handshake (2.12a) Handshake is a Full featured VT52/100/102/220

WB5 - Fonts #1- Several fonts (35) for the Amiga, also included are five PageStream fonts,and ShowFont - a font display program.

WB7: Clip Art - This disk is loaded with black and white clip art. Art includes, trees, watches, tools, US and State maps, and more.

WB10:Virus Killers - The latest and best VirusX(4.0), Kv(2.1), and ZeroVirus(1.3).

WB12: Disk Utilities #1- This great disk is loaded with wonderful utilities for everything including making disk labels, disk cataloging, disk optimizing, disk and file recovery, archiving and organizing, and all sorts of file and directory manipulation. Incudes SID, greatly reduces CLI use.

WB13: Printer Drivers and Generator - over 70 different drivers, and if these don't do it, with PrtDrvGen you can make your own.

WB15: Business - This disk contains a spreadsheet, a database, a project/time management program and financial analysis (stocks).

WB16: Business - This disk contains an inventory manager, a loan analysis program, a great calendar/schedular, a rolodex program, and pennywise a good "Cash Book" accounting for home or office.

WB18: Word Text Processors - This disk contains the best editors. Includes,TextPlus (v2.2e) a full featured word processor, Dme(v1.35) a great programmers editor with strong macro features,TexED(v2.8) an enhanced Emacs type editor, and a spell checker.

WB20: General Interest - DiskSalv V1.42 a disk recovery program for all Amiga file systems, FixDisk V1.0 another file recovery program with features DiskSalv doesn't have, 3DLookt gives a 3D appearance to your WorkBench, Clean V1.01 a program to de-fragment memory, Tracer - trace any part of an image.

WB23: Graphics and Plotting - Plot (20b) a three dimensional mathematical function plotter. Can plot any user defined function, BezSurf2 - produce awesome pictures of objects one could turn on a lathe. Can also map iff image files onto any surface that it can draw. Now compatible with most 3D packages, and VScreen - makes a virtual screen anywhere, great for DTP.

WB25:Educational - On this disk are two programs that can generate maps of differing types, World Data Base uses the CIA's data base to generate detailed maps of any entered user global coordinates. Also Paradox a great demonstration of Albert Einstein General Theory of Relativity.

WB26: Disk Utilities #2 - MrBackup, KwickBackup - two well done utilities to help with harddisk and floppy disk backups, FileMast - a binary file editor, Labelprinter - Disk label printer with very powerful features.

WB27: Nagel - 26 Patrick Nagel pictures of beautiful women.

WB29: Graphics and Sound - This disk has several different Mandelbrot type programs for generating stunning graphics. Includes, MandelMountains - a realistic terrain generator, Fracgen - generated recursive fractals from user input, Mandelbrot and Tmandel - two fast mandelbrot generators, also Mostra - the best IFF display program to date, will display ALL IFF's including Dynamic HAM, and Sound - a great IFF sound player, will play anything. Try this disk, you'll love it!

WB33:Circuit Board Design - several terrific routines for the electronic enthusiast. Including PCBtool - a circuit board design tool, LogicLab - circuit logic tester, and Mcad (1.26) a well done new release of this PD CAD program, now comes with predrawn common circuit components for insertion into schematics.

WB36: Graphics - On this disk are several programs to create stunning graphical images including, MPath - creates swirling galaxy images, Roses - produce an unlimited number of variations of images that a symmetrically similar to a rose, SimGen - display those spectacular images as part of your workbenck screen, and RayShade - a very good raytracing program, create your own beautiful 3d graphics.

WB38: Plotting and Graphics - Plotxy is the most powerful full featured plotting package. Used by many colleges and universities. A welcome addition to our library! Highly recommended. Plans - a incredibly well done Computer Aided Drafting program, very full featured. Tesselator - a program that helps generates fantastic looking, recursive M.C. Ecsher type pictures.

WB39: Music - Intuitracker is an German offer of an exquisitely well done program that allows you to play music on your Amiga with CD like controls. Lets you strip out music from your favorite games or others and include them in your music library.

WB40: Music - "CD on a disk", 90 minutes of modern music on this well presented collection.

WB41: Music - MED an incredibly well done, full featured music editor. Create your own stunning music directly on your the Amiga. Similar to SoundTracker but better. Very powerful, easy to use program.

WB43:Business - This disk contains AnalytiCalc - probably the most powerful spreadsheet program on the Amiga. A full featured spreadsheet with many features expected in a commercial package.

WB53:Graphics- The disk contains C-light - The easiest to use raytracing we have seen to date. This one started out life as a full featured commercial product similar to Sculpt3d. Raytracing programs can generate stunning, realistically shaded objects. Also, sMovie - a full featured video text titler similar to ProVideo, Broadcast Titler. Great video scrolling, wipes, special effects, and more...

WB54:Printing - This disk contains several routines to help with the chore of printing. Includes Gothic - Finally a Banner printer for the PD! PrintStudio -a well implemented all-purpose printer-utility with a very comfortable graphic interface and many advanced features, Lila - with ease, print ASCII files to a PostScript printer, and many more.

WB55:Application - XCopyIII - a full featured disk copier, make backups of write protected disks. RoadRoute - find the quickest route from one city to another, highway description included, Diary - a diary program like "Dougy Howard M.D", Cal - a calendar program, Magman - a database tailored to maintain records on articles and publications.

DD47: Pascal - This disk contains everything needed to program in Pascal. Includes, A68k (1.2) 68000 assembler, Blink linking software and PCQ (1.0) a modest Pascal sub-set compiler.

DD49: C Compiler - contains zc(1.01) fully K&R, zcc(1.0) front end, A68k(1.2) assembler, Blink linker.

DD51: Circuit Analysis - Aspice (2.3) A full featured program for electric circuit analysis.

DD52: Scientific - Includes Elements - an incredibly well done periodic table program with source, Scientific plotting - over 600k of Lattice C source routines that can be included in your own programs.

DD54: Compression - This disk is loaded with ALL of the best file compression programs and aids for the Amiga. Many of the programs can be used by the new user. Includes Arc(2.3), Lharc(1.0), Lhwarp(1.03), Pkax(1.0), PowerPacker(2.3a) a must have by all, Zip(1.0), Warp(2.04), and Zoo(2.0). Also IFFcrunch an excellent compression for IFF files.

DD55: ARP - On this disk you will find the complete ArpRel3.0 release including the full user docs, the full Developers guide, and Conman (1.4). ARP is the official AmigaDOS Resource Project (ARP) release 1.3. ARP makes many improvements to AmigaDOS and makes your system easier to use from the CLI.

DD57: Advanced Utilities - Msh - like Cross-dos, copies files to and from MS-DOS, Pal-NTSC - convert any pal program to NTSC and vice versa, Also several utilities that improve your startup-sequence, plus 25 more programs.

DD62: Basic and Xscheme - Cursor - a full featured Amiga Basic compiler, sbasic and ftext - several wonderful routines to help in basic programers, and Xscheme - an interpreted object oriented programing language.

DD65 C Tutorials - Several well done tutorials on how to program the Amiga. Includes tutorials and working examples on Device drivers, IFF reads and writes, Sound implementation, Arcade game design and implementation, Double Buffering, and others. A must have for Amiga Programmers.

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EAR TO THE WALL

Lotus wilts? *AmigaWorld* intimated a while back that Lotus is working on an Amiga version of its 1-2-3 spreadsheet. Some recent snooping on CompuServe revealed rumors of a standoff between Commodore and Lotus. Apparently, Lotus is seeking direct financial reward for its port. Our sources report that the deal isn't dead, but could be stymied.

A competitor in? Several sources at Microsoft reveal an increased interest in the Amiga and its installed base of some two million machines. This industry giant is thinking of an Amiga version of its popular integrated package, Microsoft Works. An Amiga Works probably would not, however, see the light of day inside of two years, if ever. Admittedly, that's slow going—but Microsoft has a habit of getting things right the first time around.

Toaster Mania. NewTek's active shipping of its Video Toaster has generated celebrity interest right off the bat. Here's a quick tally of highbrows who reportedly own or have expressed an interest in the Toaster: The manager of Pink Floyd, ZZ Top, Michael Winfield (the cop with all the sound effects in the Police Academy movies), Danny Elfman (credited with Batman, Dick Tracy, Simpson's sound tracks, and the leader of Oingo Boing) and Todd Rungren, who is reportedly going to acquire five units. This may be just the tip of the celebrity iceberg.

Money, Money, Money. Here are a few tidbits from the 1990 Commodore Annual Report: Irving Gould owns 20% of Commodore stock, or 6,595,338 shares. Alexander M. Haig owns 1,500 shares and will remain on the board until 1993, unless voted out. At $2,015,949, Mehdi R. Ali, president of Commodore International, actually makes more than Chairman Irving Gould, who only pulls $1,750,000.

SOAP BOX

EDITOR'S NOTE: As we start 1991, you will notice some changes in ***Last Licks****—one of which is our new "Soap Box" column. Each month we will present an opinion piece—an essay, really—that we hope will provide food for thought for members of the Amiga community. Essays will come from a variety of different members of that community:* AW *editors and readers, Amiga users and developers, or even a spokesperson from Commodore on occasion. We welcome feedback from all quarters; perhaps some of the responses may become the basis for future "Soap Box" essays. If you would like to reply to any opinions expressed here, please write to Jan Jackson, "Soap Box,"* AmigaWorld, *Elm St., Peterborough, NH 03458.*

A View from the Patio

IN MY SHORT tenure as an *AmigaWorld* staffer, I have had the good fortune to learn a lot about the Amiga and its community. As Amiga users tend to be a helpful lot, that part was easy: All I had to do was listen. Unfortunately, during the listening process, I took in a great deal more than just information, namely, some pretty strong opinions and a lot of conjecture on a variety of topics. I read it in magazines and in the promotional literature from developers, and I heard it at trade shows and during telephone conversations: "[The people at] Commodore don't know what they're doing". . ."IBM and Apple computers stink". . ."The Amiga does it better than that piece of junk!". . ."Spreadsheets and networks are for those IBM nerds," and so on, along with other choice remarks all designed to bolster one ego while disparaging another.

What does this type of behavior prove? The answer is: Nothing. If there is a "bottom line," it is that everyone who uses, writes about, talks about, or makes his or her daily bread from the existence of the Amiga has a stake in its future. Not one of us wants to see it fall under the heels of a corporate giant (whether spelled with three letters or five). We all know that our worst fears will be realized if the Amiga fails to attract the new users it requires to make its market grow and prosper.

But how do we accomplish this? Not by publicly lambasting Commodore management. Not by offering to buy up the company's loose stock as a feeble and inane protest (something proposed recently by a member of the Amiga Developers' Association). Nor will we do it by rabidly shouting that our Amiga is the only computer that can generate a pretty picture. Many computers can do that. They just cost more.

While prospective users may be uninformed about the Amiga, they're not ignorant. We can convince them of the Amiga's superiority only by *showing* them and the rest of the world how good the Amiga really is. It does little good to preach to those who are already seated in the choir loft. So, get out there, grab a friend, and show them what the Amiga can do—not what the other machines can't do. No matter how good it makes you feel, ego bashing is a tactic that earns only contempt from its recipient and from everyone who witnesses it.

Because it is impossible to separate a computer from its software base, third-party developers will have a very large role to play. They must begin to think more about the mundane but necessary elements (and less about the bells and whistles) that make up a good software package. They must take seriously the fact that not everyone who sits behind the Amiga's keyboard is a programmer.

Many applications manuals are well below par (in an industry where the norm is based on there being so many bad manuals); help screens are sparse; install programs that work are a rare Sunday treat. Our marketing also needs a dose of professionalism if we are to be taken seriously in a competitive global market. Here's a place where the ADA can invest its money to reap a princely return.

If we are to expand the Amiga's circle of influence, we must venture from our tidy backyards and greet the computing world on its own terms.

—John Wolfskill
Senior Writer, Technology

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179	184	189	194	199	379	384	389	394	399	579	584	589	594	599
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TIP

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The Workbench's System Directory

The System directory contains tools that you can call from the Workbench – DiskCopy, FastMemFirst, NoFastMem, FixFonts, Format, InitPrinter, GraphicDump, and SetMap.

DiskCopy lets you make backup copies of your disks. Selecting the DiskCopy icon, however, does not start the copying function. You have to use the CLI DISKCOPY command or drag one disk icon on top of another.

FastMemFirst rearranges the system memory lists so that auto-configured memory (expansion memory that automatically tells the operating system, via special routines in Kickstart, what it is, where it is, and what it needs for system resources) appears on the system list ahead of any other non-autoconfigured memory.

Rather than rearranging, **NoFastMem** disables all memory beyond the 512K that reboots your system and that the custom chips

Continued on other side

(Agnus, Denise, and Paula) can access. Some early programs written for a 512K Amiga assume that there is no other memory available and will not run on expanded sytems. Using NoFastMem you can run many of these early programs on Amigas with more than 512K of memory.

If you delete or add any fonts to your fonts directory, the internal list of available fonts may not reflect the current contents of your disk. Running **FixFont** patches the system list to match the disk configuration. You need to run this tool only if you change the contents of the fonts directory after a boot. AmigaDOS updates the systems' font list automatically when you boot the system.

Format lets you prepare a new disk to store information. You can call this function with Initialize on the Workbench menu or with the CLI FORMAT command.

Many printers require the computer to send an initialization sequence (a special string of characters) before sending a document. If your software does not transmit such a sequence, you can use **InitPrinter** to initialize your printer.

GraphicDump lets you take a snapshot of your screen and "dump" (send) it to your printer.

SetMap lets you specify how the Amiga interprets the keyboard. You can change the keyboard to use American, British, French, or any of eight other international character sets.

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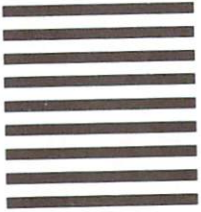

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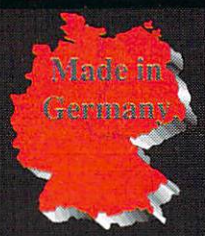

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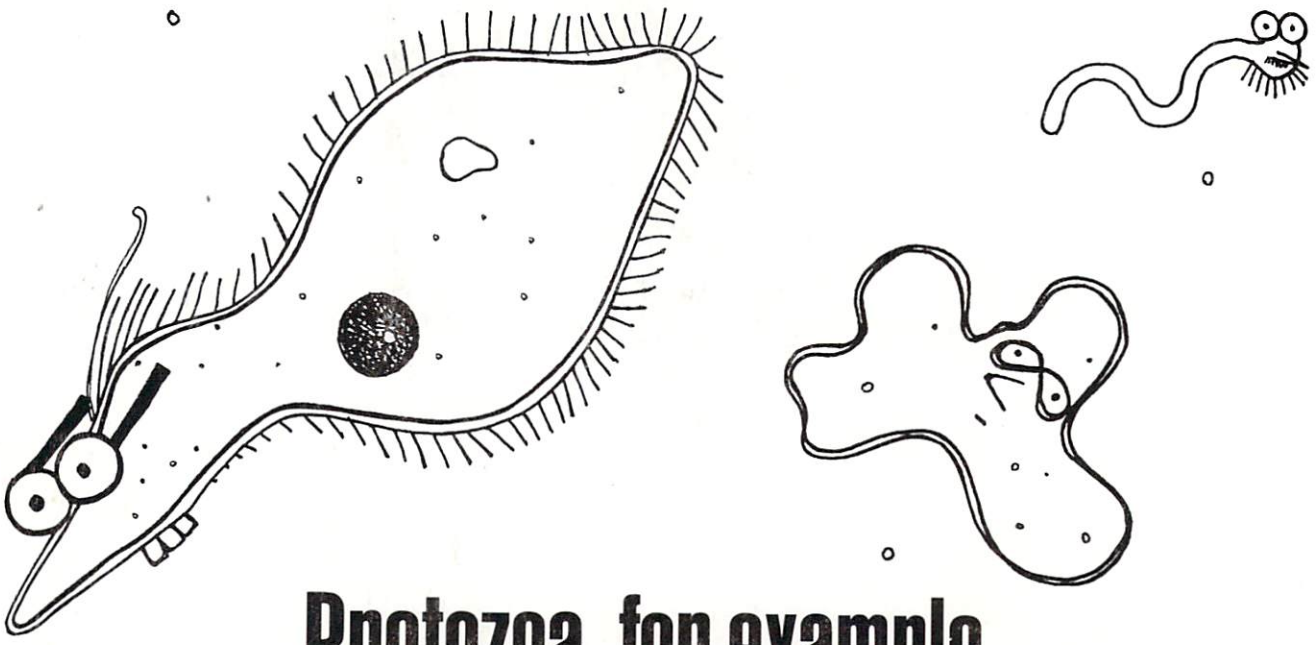

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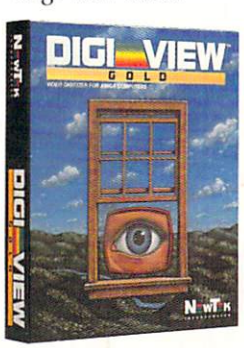

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