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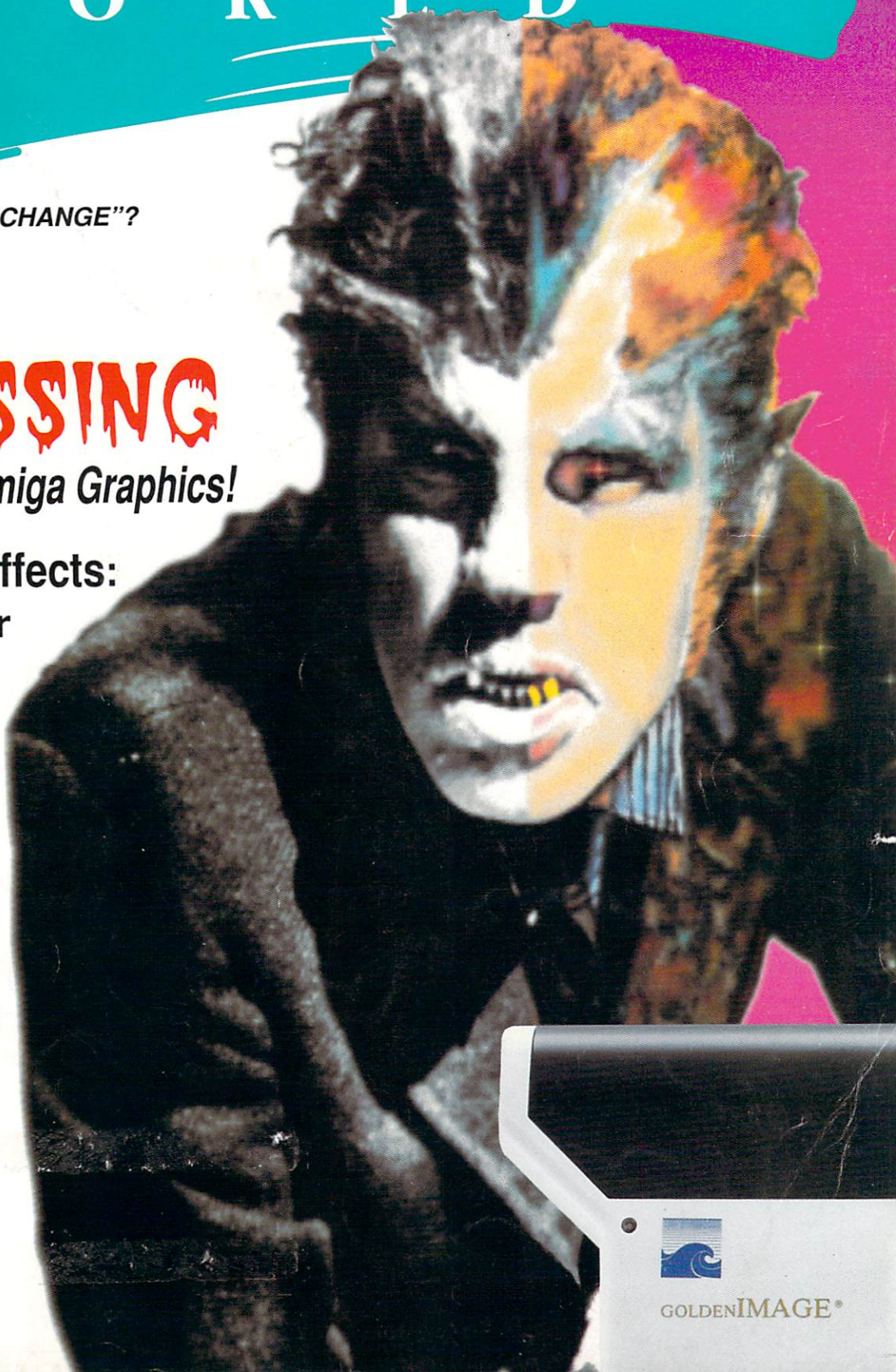
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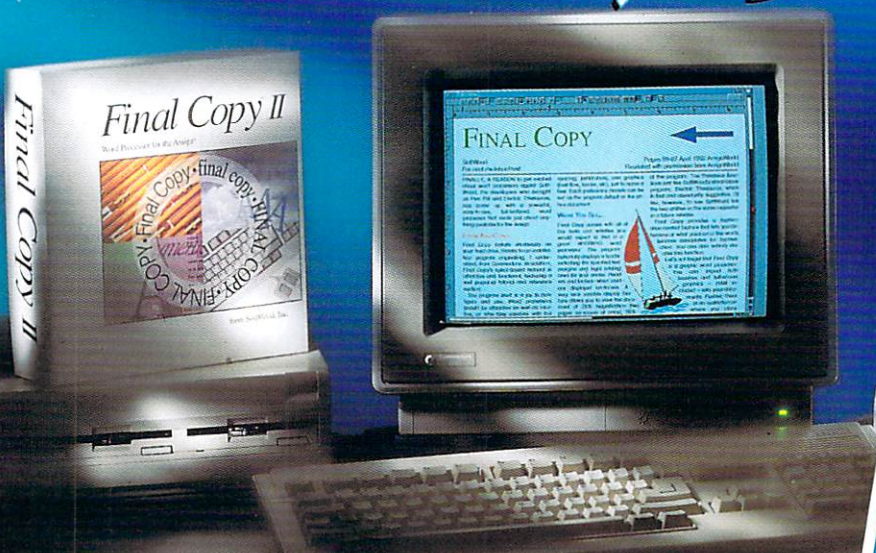
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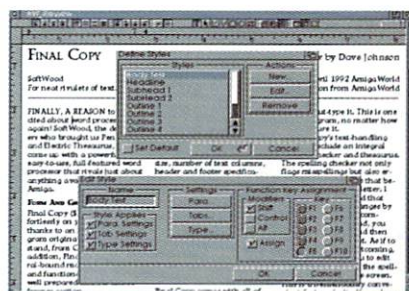
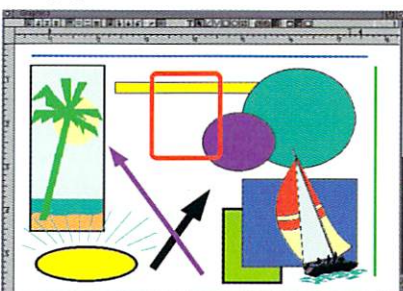
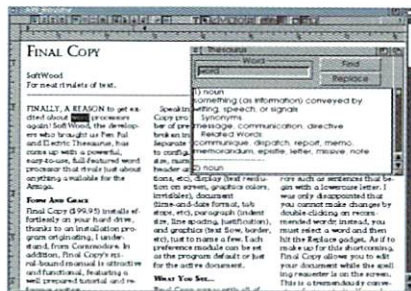
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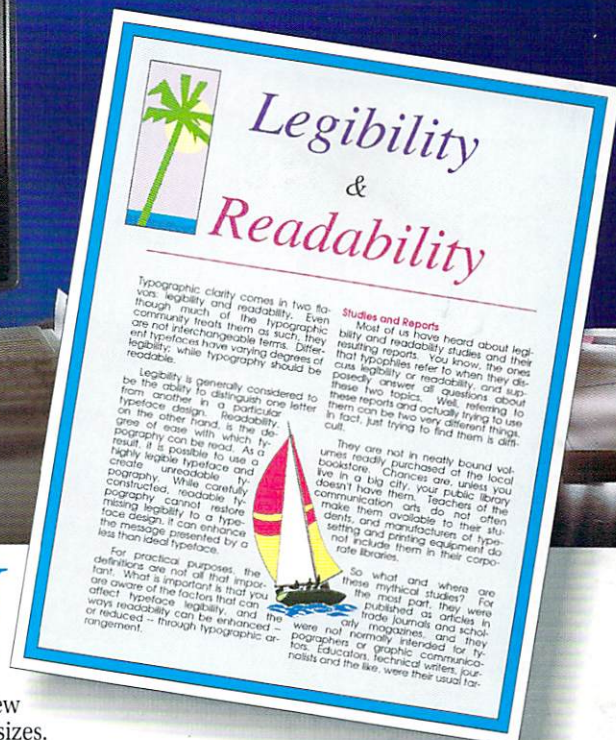
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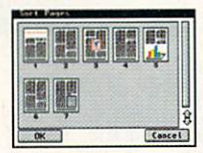
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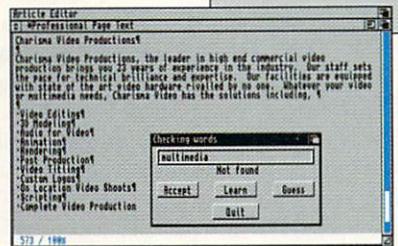
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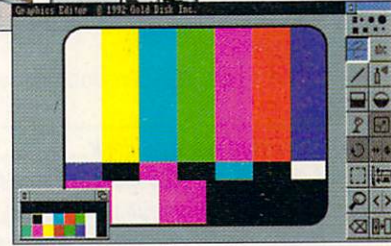
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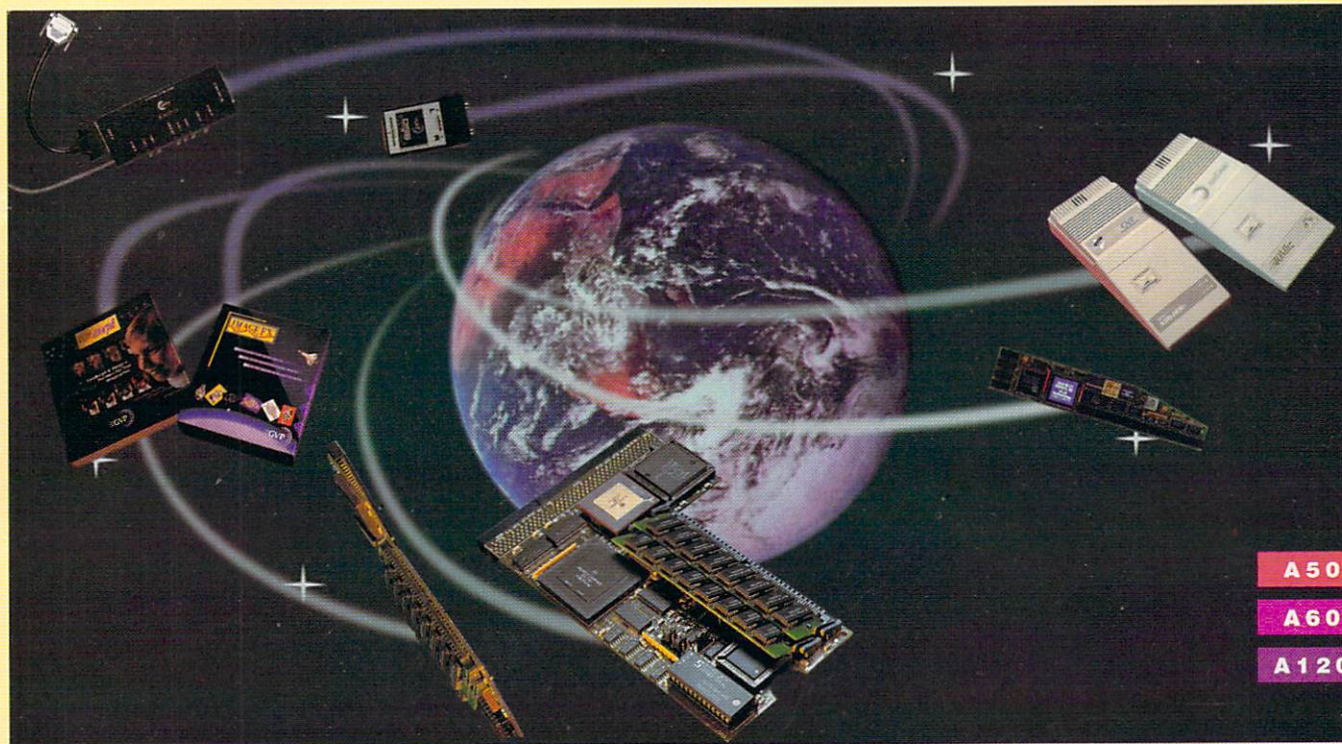
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AmigaWorld (ISSN 0883-2390) is an independent journal not connected with Commodore Business Machines, Inc. *AmigaWorld* is published monthly by TechMedia Publishing, Inc., an IDG Company, 80 Elm St., Peterborough, NH 03458. U.S. subscription rate is \$29.97, one year; \$57.97, two years; \$83.97, three years; Canada, \$41.97 (includes GST), and Mexico \$38.97. Foreign Surface \$49.97. Foreign Airmail \$84.97. U.S. funds drawn on U.S. bank. Prepayment is required on all foreign subscriptions. All foreign rates are one-year only. Second-class postage paid at Peterborough, NH, and at additional mailing offices. Phone: 603-924-0100. Entire contents copyright 1993 by TechMedia Publishing, Inc. No part of this publication may be printed or otherwise reproduced without written permission from the publisher. **Postmaster:** Send address changes to *AmigaWorld*, Subscription Services, PO Box 595, Mt. Morris, IL 61054-7901. Nationally distributed by Kable News Co. *AmigaWorld* makes every effort to ensure the accuracy of articles, listings, and diagrams published in the magazine. *AmigaWorld* assumes no responsibility for damages due to errors or omissions. Printed in the USA.



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EDITOR'S DRAWER

Some expert advice for budding computer artists who seek to enhance their Amiga interests and talents.

EDUCATING AMIGA ARTISTS

HOW DO YOU become a successful computer graphics artist? It's a question on the minds of many *AmigaWorld* readers considering an education and career in computer art and animation. More than a few interested readers have asked me which courses of study and which schools are best, what careers are available, and how to go about securing a position in the computer art field.

Lacking answers, I turned to the experts—successful professionals who use the Amiga—who provided useful insights and valuable advice.

RECOMMENDED STUDY

Many schools offer a variety of high-quality computer programs, as well as degrees in computer visual arts, for aspiring computer artists.

It wasn't always the case. Bruce Elliott, art dept. head at Germantown Academy (Fort Washington, PA), notes that when he started using his Amiga—six years ago—"it was impossible to find college programs that offered a sound foundation of courses for the computer artist or art teacher. All I could do at that time was teach myself..."

Many college programs now exist that teach basic drawing, painting and design, as well as computing applications, computer graphics and animation, and video/TV production. This is due, in part, to an increased realization of the computer's role as a critical tool for image creation and manipulation.

The experts I contacted unanimously recommended that college students become well-grounded in traditional art skills and design basics, as well as general computer ability. "Get a solid foundation in traditional art skills while you pursue computers as a medium," suggests Joel Hagen, *AW*'s long-standing graphics columnist and college arts and animation instructor in California.

But also, it is important to develop other skills—from basic math and sci-

ence to creative writing to drafting—that could be applied to your career. An interdisciplinary approach, allowing you to combine your study of computer graphics with other courses, is best.

Phil Fitzpatrick, associate professor of art at Lamar University (Beaumont, TX), advises, "Take a broad base of subjects; [don't] focus entirely on computers or computer graphics." He recommends complementing your study of computer art with "courses that teach thinking, creativity, and communications, which are fundamental to any type of visual imaging or communications."

In the world of computer art, it's best to maintain an open and creative mind and be prepared for anything, warns Fitzpatrick. "People will ask you to do the strangest sorts of things and assume that you know how!"

Rick Manasa, who serves as an Amiga consultant in audio-video and educational applications in Michigan, proposes that artists also develop some business, accounting, and communication skills. "All people in graphics and animation need good communication skills to be able to translate producer and client desires into reality."

WHICH SYSTEM TO BUY?

It should come as no surprise that the folks I queried overwhelmingly cited the Amiga as the most affordable, and easiest computer to use for animation and desktop video. In addition, however, students should become familiar with other platforms (e.g., PCs, Macs, and Silicon Graphics workstations).

Each platform has its merits. Jeff James, a student at Colorado State University (Fort Collins, CO), urges: "It never pays to criticize someone for his or her choice of computing machinery. Starting an argument with a potential employer over which computer is better is a sure way to be taken out of consideration for the job."

In the pursuit of a computer art de-

gree, your focus should be on *art*, not computer, according to Michael Hanish, an instructor for the Arts Institute of Vermont. "The hard part... will be in figuring out what to do rather than how to do it. I strongly feel that form and technique must be a servant to content. Computers are tools with a purpose—whether it be aesthetic, educational, or practical."

JOBS

If you have the education and/or the experience, how will you parlay your skills into a job? There's no easy answer, but the experts agree that talented artists are in high demand in the traditional fields of film, advertising, publishing, and television, and these opportunities will continue to expand.

Designers are well-suited for CAD applications in drafting, architecture, industrial design, mechanical engineering, and textile design. Multimedia production for training, education, and business is also a growing field.

"Today, the opportunities are almost endless... from designing artwork for computer games to rendering special effects for sci-fi films. Many of the nation's largest traditional animation houses—such as Disney, whose latest film, *Aladdin*, features computer-generated imagery—are using increased amounts of computer animation in their productions," states Jeff James.

Ingenuity, timing and perseverance are key. Computer artists are needed in many fields, including advertising, communications, and education, but ultimately, as the computer animation market evolves, you could find yourself creating and defining your own position.

"There are new opportunities in areas that have only recently developed an acute awareness of the computer as an image-making device (e.g., law, medicine, education and industrial training services)," adds Fitzpatrick.

Continued on p. 92.



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Circle 53 on Reader Service card.

OVERSCAN

News, New Products and Networks

AMIGA SUMMIT TAKES WORLD VIEW

ORLANDO, FLORIDA—This year's Amiga Developers' Conference was the first to bring together Amiga programmers, engineers, and marketing reps from both sides of the Atlantic. Not surprisingly, the late-winter event was also the largest DevCon to date. More than 400 industry insiders—from the US, Canada, and 11 European countries—gathered to attend seminars conducted by Commodore's Engineering, CATS (Commodore Applications and Technical Support), and Sales divisions.

Fueled by the recent release of the AGA-based A4000 and A1200, the mood was optimistic. The first of the 40 sessions outlined Commodore's technical development and marketing philosophies, directions, and strategies. The bulk, however, focused on specific issues

such as digital-signal processing, retargetable graphics, and, yes, future chip sets. Although attendees are under nondisclosure concerning specifics, we can assure you that Commodore is planning big for the future of Amiga.

While the amount of material presented was immense—backed by 700 pages and four disks of documentation—attendees still found time for socializing and showing off. As always, the computer room was crowded well into the wee hours of the following morning on Developers' Showcase evening. The annual "I'll show you mine if you show me yours" session was further enlivened by a number of interesting European products, from graphics boards to shareware.

The five-day program was capped off by the 1992 Developers' Choice Awards

Luncheon. Enthusiasm for the A4000 was clear here, as the machine itself picked up the Best Hardware award, and its AmigaDOS Release 3 operating system received Best User Interface honors. Other winners included SAS Institute's SAS/C6.0 (Best Professional Productivity Software), Electronic Arts' DeluxePaint IV (Best Consumer Productivity Software), Software Toolworks' Miracle Piano Teaching System (Best Education Software), and 21st Century Entertainment's Pinball Fantasies (Best Entertainment Software). Hardware designer Brad Carvey of NewTek had the crowd eating out of his hand after his thank-you speech following the Video Toaster's induction into the Amiga Hall of Fame.

—Linda Laflamme

"AW RIGHT!" SAID FRED

PETERBOROUGH, NH—Drivers, divers, doves, and dynamite. These are just some of the subjects depicted in *Amigamations*—the video containing the 20 winningest entries from *AmigaWorld's* Third Annual Animation Contest.

When 17 *AmigaWorld* and *Desktop Video World* staffers gathered to judge each of the 20 finalists in four areas (sound, graphics, storyline, and originality), fellow New Hampshireite Mark Thompson handily floated away with first place and a grand prize of over \$12,000 in Amiga gear for his 4 1/2-minute exercise in subtle 3-D rendering of *One Stormy Night With Fred Floaty*. Resplendent in his LightWave 2.0-cured polymers, Fred, a cheap inflatable toy, experiences a daydream so exciting it nearly bursts his Latex lining.

Noted animator Dr. Eric Fleisher gave Fred tough competition with *Commuter Chip*, the second-place winner. The good doctor's animation depicts a society in which 3-D computers reign supreme. See



Fab Fred finishes first.

computer chips commute to work. See them master manufacturing processes. Will their efficiency improve their quality of life? Who cares? After all, they're just computer, er, commuter chips.

Bob Eaton captured third place honors with *The Sculptor*, in which a strange 3-D creature begins sculpting with traditional manual tools but soon switches to high explosives. When the dust settles, a resulting

sculpture bears the remarkable likeness of... could it be...?

Matt McDonald and Mark Miller pushed the envelope of technical and artistic innovation to claim fourth place with the 3-D epic *Life*. (A still from this animation appeared on *AmigaWorld's* February cover.) Fifth place went to the Toronto-based duo Rob Currie and Phil Maeers for the politically-inspired *Mouseland*, a 2-D dynamo.

Other animators whose work appears on the tape are Dennis Schaeffer, Tony Goskie, Randy Wall, Bo Feng, David Smalley, Dan Wilcox, Dan Ritchie, Alan Price, Tracy Sabin, Jun Whang, Otto von Ruggins, Dave Woodard, and Chuck Wardin.

Choosing the winner was far from easy, as all the pieces are strictly top-notch. And choosing the "Top 20" among the hundreds of entries was no easier. This contest gave *AmigaWorld* the chance to witness first hand how creative and technically excellent Amiga animation has become. Thanks to all who participated.

—Tim Walsh

To locate the vendors of products mentioned, see the "Manufacturers'/Distributors' Addresses" list on p. 92.

SCALA

**Everybody's talking multimedia revolution.
Allow us to light the fuse.**

A lot of apples were bruised when we first introduced Scala, the professional presentation package. With the new Scala MultiMedia MM200, they will be blown into oblivion!

Let us introduce a few of the features that make Scala MM200 combined with the Amiga the world's most powerful multimedia environment:

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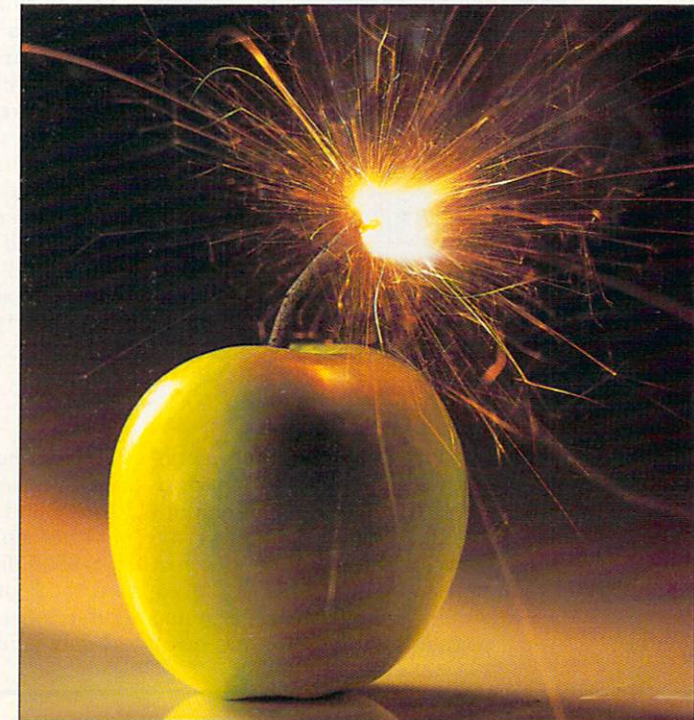
A revolutionary new plug & play system, for the integration of laserdisk, still video, MIDI, or CDTV sound in your Scala presentation. Extra EX'es, such as 24 bit graphic support and VCR control are also available.

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A series of advanced techniques make Scala load and display pictures and animations faster than any other package!

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Creating interactive hotspots has never been so easy! Scala MM200 even includes full support of variables.

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The multimedia language Lingua with its close link to AReXX puts the advanced user in total control!

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"...the best program in show business." *Amiga Format (UK)*

"Scala MM200 is the kind of software that many serious users simply can't afford to be without." *Amiga Computing (UK)*

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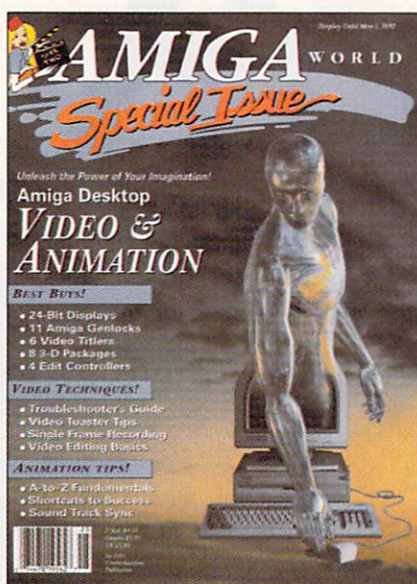
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Why make it harder?

AMIGA GRAPHIC GARNERS GOLD

Magazine and Bookseller magazine recently awarded *AmigaWorld's* 1992 Special Issue first place in the Computer Magazine category of its annual cover competition. Created entirely on the Amiga using products from Impulse and ASDG, Tim Wilson's 3-D image wowed judges and out-placed *PC Computing* and *PC World* magazines, which took second and third places, respectively.

The cover image represents the talents of many folks. Congratulations are due not only to Mr. Wilson for the stunning rendering, but also to Howard Happ for his excellent art direction, Lou Wallace for technical assistance, and finally to Roger Goode, the person who captured our imaginations with his *Terminator 2*-inspired concept.

Silver man takes the Gold award.



HERE'S YOUR CHANGE

If **A-Talk** is the program you use to speak up on line, you should know that developer **Felsina Software** has retaken its telecommunications package from New Horizons Software, which previously sold and marketed it. To talk turkey about A-Talk in the future, contact Felsina directly. (RS# 126.)

Even if you can't stand modern art, you may like the most modern **Art Expressions** (\$249, **Soft-Logik**). Release 1.02 improves many features of the original release. Soft-Logik has rewritten its Preferences printing routines (which were a problem in the first release), and has polished Adobe Illustrator and IFF 2R2D support. If you haven't sent in your registration card yet, do so now; Soft-Logik will send registered owners not only the update disk but also font and clip-art disks. (RS# 127.)

A HANDFUL OF COLOR

While there's no shortage of monochrome hand scanners on the market these days, **Migraph** is the first to put color scanning in the palms of Amiga users. Using the same four-inch wide scanning head of other hand-helds, the **CS-6000** recognizes and scans up to 262,144 colors in five color modes (su-

per color, 4096-color, gray-scale, monochrome dither half-tone, and monochrome line art/text), at six resolutions from 50–400 dots per inch. It offers true gray-scale scanning with 64 gray levels at 200 dpi.

Features include a stop/start scanning switch and adjustable brightness control.

The unit works with Workbench 1.3 and up, and supports the AGA chips of the A1200 and A4000.

Until April 30, you can purchase the CS-6000 direct from Migraph (suggested retail price is \$549) for \$399. This offer includes free software upgrades through June 30. (RS# 125.)



ON-LINE SCAN

By Tim Walsh

Reader Michael Hache recently expressed concern about the focus of this column, which was originally conceived to list freely distributable Amiga software. Rest assured that you will see more of popular Amiga PD files—with pauses for effect. After one such pause this issue, I'll hit the bricks next month with new-file news.

While this column discusses various on-line offerings, it rarely mentions my primary use of the nets: e-mail.

AmigaWorld relies on e-mail not only for transferring manuscript and image files, but also for monitoring the pulse of the Amiga community and, perhaps

most importantly, for getting reader feedback.

We editors tap into all the major networks that attract Amiga users. You can reach us on GENie, CompuServe, Portal, and BIX—either individually or by way of *AmigaWorld* areas.

BIX has reserved an area in our name (number 12 on the Amiga.Exchange menu) for a couple of years. You can also contact me directly through BIX via my handle twalsh@BIX.com or simply twalsh.

AmigaWorld maintains an area on Portal as well. After logging on, just enter: "GO AMIGA;3;1." You'll see our area is broken down into smaller sub-

sections, each with its own heading. My own Usenet address through Portal is timwalsh@cup.portal.com.

While the editors occasionally post messages in these areas to solicit feedback, we mainly scan for messages and respond to them. Feel free to use these forums to tell us what you like or don't like about *AmigaWorld*, and to let us know which issues and products you'd like to see us cover. Any message you post will make the office airwaves, and may well prompt discussion among other readers.

While *AmigaWorld* has no designated area on either CompuServe or GENie, you're apt to

bump into one of us on those nets, too. To e-mail me on CompuServe, use the account number 76376,2137. With reservations about breaking all e-mail delivery records, my address on GENie is twalsh9.

So, the next time you're on line, be sure to direct your questions, comments, and messages to us. We'd sure like to hear from you!

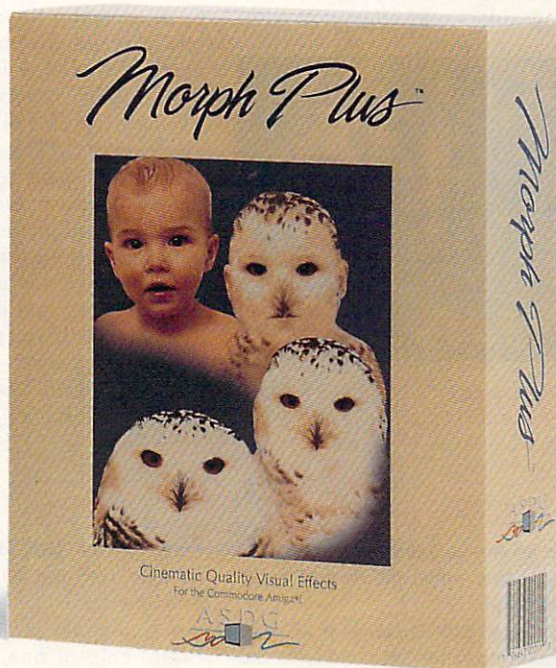
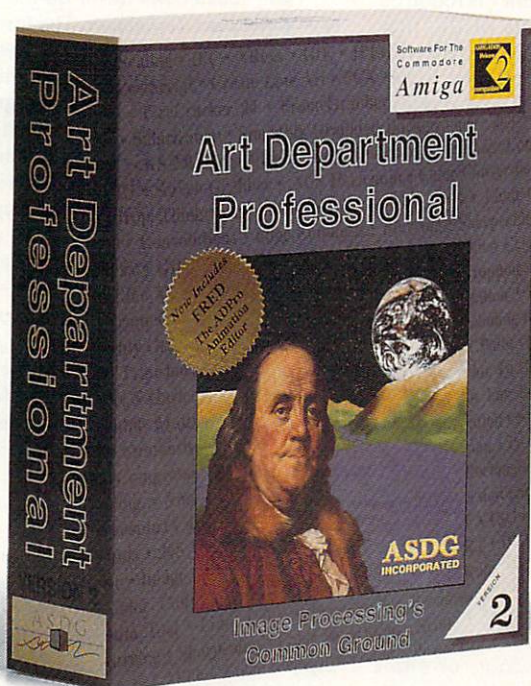
BIX
800/695-4882
617/354-4137/

CompuServe
614/457-0802
800/848-8199

GENie
800/638-9636

Portal Communication
Company
408/973-9111 □

Bring Home The Best



If you're thinking about getting an Amiga® special effects or image processing product, here are some facts to consider:

- ASDG's Art Department Professional was named the "Best Image Processing Program" for 1992 by the readers of Amazing Computing Magazine and "Best Video Software" by Germany's Amiga Plus Magazine.

- American Software And Hardware Distributors and MicroPace Distributors (the two largest Amiga® software distributors in North America) cite ADPro and MorphPlus as the best selling products of their kind.

- ADPro placed third among ALL Amiga® software products on the MicroPace 1992 Top 50 Sellers List.

- The Post Group, one of the largest post production houses in the world, has used ADPro and MorphPlus in the production of special effects for the prime time TV



show Quantum Leap and for major motion pictures.

- Mark Swain, an AmigaWorld reviewer (and animator for Foundation Imaging, the creators of the special effects for Babylon 5), said, "MorphPlus produces the most realistic shape shifting special effects I have ever seen on a desktop."

- David Duberman, Executive Editor of Video Toaster User, said in a comparative review of Amiga®

morphing products, "MorphPlus is the Rolls Royce of Amiga® morphing software... it will pay for itself with one job."

Consider the facts.
Then bring home the best.



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CIAO, AMIGA!

Amiga artists have always made an impressive showing in the Italian BitMovie computer graphics and animation com-



Antonio De Lorenzo's 3-D work won the hearts of BitMovie '92 judges.

petitions. The latest was no exception. While Italian-language fluency is required to discern the finer points of the new brochure announcing BitMovie '92 winners, no special skills are needed to see that 17 of the 18 top 2-D animations and 21 of the top 25 3-D animations are Amiga generated. The still-image category winners list spans several pages, but just one of those listed on the first two pages is a Mac creation; the other nine are Amiga works. Among the US Amiga artists on the winners roster are Mary McJohnson, Eric Schwartz, and Bill Graham.

BitMovie '93 will take place April 8-12 in Riccione, Italy. For details, contact Carlo Mainardi, Via Bologna 13, 47036 Riccione, Italy; fax: 39/0541-601962.

A1200 OR BUST

Where's an Amiga 1200 owner to go for machine-specific information and products? Right here!

GVP's new **A1230 Turbo** is a 40 MHz 68030 accelerator that fits inside the expansion bay on the bottom of the computer. Two SIMM sockets allow you to add RAM to suit your needs: Use 4MB SIMMs for up to 8MB of 32-bit wide 60ns DRAM, or use 16MB chips for up to 32MB. A Floating Point Unit (FPU) socket lets you add a coprocessor to speed math-intensive operations. Populated with 1MB RAM, the board sells for \$499. (RS# 132.)

MicroBotics offers some of the same op-

tions with its **MBX 1200z**, which installs internally onto the A1200's bus connector. The board provides an FPU and a real-time clock/calendar, and accepts one 32-bit SIMM chip of one, two, four, or eight megabytes of RAM. The board comes with diagnostic software and costs \$189 without memory. (RS# 133.)

Beginners might benefit from the **A1200 Insider Guide**, which goes for £14.95 from British publisher *Bruce Smith Books* (ISBN 1-873308-15-9). In 24 chapters, the book touches on Workbench 3.0, utilities, Preferences, and AmigaDOS via tutorials. (RS# 134.)

IMPROVING TOASTER CHARACTER

"Your Toaster will never be the same!" says *Innovision Technology*. The firm's new **Montage** (\$499.95) promises professional-quality text display, DVE transition sequencing, and 16-million color graphics output—plus the ability to integrate smoothly into the Toaster environment.

Innovative character-generation is at the heart of Montage. The program's typefaces offer real-time click-and-drag font scaling, and high-level antialiasing for an effective one-nanosecond resolution. Montage's eight master character sets include symbols and international characters, and for increased flexibility, the program loads Toaster, Chroma, and Amiga font formats.

Montage also imports and exports image files in IFF and framestore formats, and its ability to display 24-bit graphics on the Toaster's framebuffers allows for such applications as compositing multiple images with variable translucency blending. The program can generate full-color gradient spreads, instant beveled boxes, and embossed wallpaper patterns. Its sequencing capabilities let you automate Toaster Switcher functions for multiple event playback, and you can apply any Toaster DVE to Montage titles, framestores, or video sources.

Montage can calculate directly in D2 framestore format for improved signal quality and display speed. What's more, its drivers can improve the quality of the Toaster encoder's video output, and an optional NTSC can reduce dot crawl and ringing artifacts. (RS# 128.)



OVERHEARD

It's time for spring cleaning in West Chester, and *Commodore* hopes to move products out of its warehouse by polishing prices on several pre-AGA products. The largest savings are available on the most powerful machines; you can save over \$3000, for instance, on an A3000 Tower with a 68040 processor, 200MB hard drive, and 5MB RAM. That model, A3000T-40/200, is now \$2875; other A3000s sell at significant savings, too. At the other end of the scale, an A2000 bundled with a 1084S monitor is now \$1299 (a \$240 savings), and CDTV carries a suggested price of \$599 (a \$400 cut). Likewise, CBM has trimmed the ticket on its A2630/4 68030 accelerator board from \$1799 to \$1299. (RS# 124.)

MARK YOUR CALENDAR!

Take a peek at the latest in Amiga technology! Here's the most recent listing of shows for the upcoming months. For information on registration, conferences, seminars, and workshops please call the number provided.

NCGA '93
April 27-29
Philadelphia Civic Center
Philadelphia, PA
800/225-6242

AMIJAM '93
May 14-15
Southern Alberta Institute
of Technology
Calgary, Alberta, Canada
403/270-0270

Image World Dallas
July 13-15
Infomart
Dallas, TX
800/800-5474

MORE CONTROL

German developer *Phase 5 Digital Products* wants to send your files careening through your data bus with its **Fast-Lane Z3** DMA hard-drive controller. The board's 32-bit Zorro-3 interface allows it to work with both the A3000 and A4000. Employing the new SCSI-II standard to

speed data transfer, it represents a real alternative to the A4000's integrated IDE controller.

Besides hard-drive control, the board offers memory-expansion options—up to 64MB—with 32-bit wide autoconfiguration. (RS# 129.)

AlfaScan and AlfaScan-Plus

400 DPI Hand Scanner 256 Grayscale Conversion Software

Regular version includes New Scan&Save Plus V1.76-V.
Plus version includes Touch Up V3.07-V.

Both models include:

- Merge It V1.4
- Alfascan scanning conversion scale
- Cartridge, Interface and Power Adaptor

Desktop Publishers and Video Professionals can produce 24 bit IFF and TIFF 256 Grayscale files with the included software. When used with products like Pixel 3D Professional from Axiom Software, generating high tech 3D logos from printed materials becomes easy, productive and profitable.



AlfaPower

External IDE Hard Drive and 8 MegaByte Ram Expansion for your Amiga 500

- Solid metal case
- RAM expandable to 2, 4, 6 or 8MB
- Holds one 3.5" or two 2.5" HD(s)
- Includes all cables, screws and software
- Autoboot, autoconfig and zero wait states
- Separate HD and RAM disable switches

Pre-configured systems with hard drive and ram installed are available. Plug an AlfaPower into your Amiga 500's expansion port and increase your performance and power in just minutes.



TKB-MT-AC

3 Button Crystal Trackball for any model of Amiga Computer

- Top quality construction with opto-mechanical encoder
- Two-color shining Crystal Ball
- Auto-fire button & key-lock function switch
- Long 6+ foot cord for convenient placement

If you are looking for a productive alternative to standard mouse input, an Alfordata trackball is the answer to your needs. Effortless finger-tip operation and reliable micro-switch buttons.



Product	Description	MSRP
AlfaRAM-0	External A500 8MB Ram Expansion, expandable to 2, 4, 6 or 8MB - chassis is similar to AlfaPower (above)	\$149.95
AlfaRAM600-2	2MB AlfaRAM600 PCMCIA card provides 2 MegaBytes Fast Ram for Amiga 1200 or 600	\$199.95
AlfaRAM600-4	4MB AlfaRAM600 PCMCIA card provides 4 MegaBytes Fast Ram for Amiga 1200 or 600	\$349.95
FDD-M312	External 3.5" 880K Floppy Drive with pass-through drive connector and on/off switch for all Amigas	\$139.95
RA2-8M-0	Low cost 8 MegaByte RAM expansion card for the A2000, expandable to 2, 4, 6 or 8MB - 0K installed	\$149.95
RA5-4M-0	Amiga 500 4 MegaByte RAM expansion card includes set-up, RAM test software and on/off switch cable	\$139.95
RA5-512K	Amiga 500 512K RAM expansion module (501-style) with Real Time Clock and on/off switch cable	\$69.95
RA6-1M	Amiga 600 1 MegaByte RAM expansion device with Real Time Clock and Memory Enable Link	\$99.95
SWB-M-BT	Floppy drive boot selector for Amiga 500 or 2000 - boot from drive(s) other than DF0:	\$39.95
SWB-M-KS+	Auto Kickstart Switch Plus for Amiga 500 or 2000 - allows convenient switching between 1.3 and 2.0 ROMs	\$39.95
SWB-M-KS6	Amiga 600 Auto Kickstart Switch - allows users to easily switch back to 1.3 ROMs for extra compatibility	\$49.95
AlfaOptic	3 Button 300 DPI Optical Mouse - comes with optical mouse pad - Note: 3rd button is active	\$79.95
AlfaPen	3 Button Optical Pen with pad - allows comfortable Pen-style mouse input with high resolution accuracy	\$99.95
CLM-MT	"High tech" infra-red 3 Button Cordless Mouse with receiver/charging stand, mouse pad and power supply	\$99.95
OMM-MT	2 Button Mouse with mouse pad, holder and extra long cord - excellent replacement mouse for all Amigas	\$59.95

When You Consider Your Choices... Remember The Company That Has Them All.

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Dealer inquiries always welcome

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OpalVision™

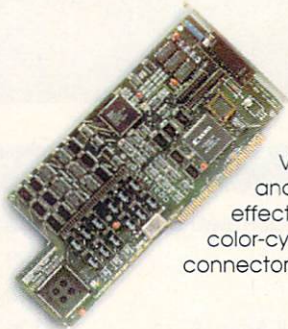
"Awesome, Spectacular, Amazing, Brilliant, Wonderful"

Choose any positive adjective and chances are it's already been used by both critics and consumers to describe OpalVision and OpalPaint — the most professional 24-bit power you've ever seen!

And now, Centaur Development and Opal Technology, whose dedication to excellence created OpalVision and OpalPaint, are pleased to give you complete details on all of the OpalVision modules...

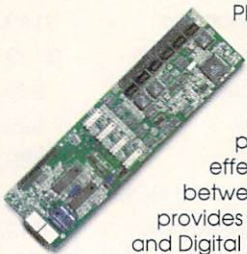
OpalVision's state-of-the-art modular design gives you unequalled versatility. Start with the OpalVision Main Board and included software. Then easily add additional modules if you require more capabilities, spending only what you need to get the results you need. Each of the modules fully integrates to create a seamless system.

The OpalVision Main Board



A true 24-Bit frame buffer and display device with 16.8 million colors available for every pixel and a maximum resolution of 768 x 480 (580 PAL). An internal card, it operates automatically in NTSC or PAL mode in any Amiga computer with a video slot (including the Amiga 4000). It's powerful VLSI graphics coprocessor enables stencil modes, a host of transition effects and smooth, hardware-controlled priority switching and scrolling/panning effects. The board's state-of-the-art design allows smooth fading of pictures, color-cycling effects, and smooth, double-buffered 24-Bit animation. Includes connectors for all of the optional OpalVision components.

The OpalVision Video Processor



Plug this card into the OpalVision Main Board and add a wealth of additional features and functionality. It's a high-quality, real-time 24-Bit framegrabber which doesn't require a time-base corrector. And, it's a professional-quality genlocker with chroma and luma keying. The 256-level linear transparency key allows the definition of transparency between two live video sources on a pixel-by-pixel basis for smooth vignettes, anti-aliased text and super-smooth effects. The Video Sandwich key allows you to insert chroma or luma keyed video between definable foreground and background layers of a 24-Bit image. It also provides real-time color processing of live video and an unlimited number of transitions and Digital Video Effects using the included OpalVision Roaster Chip and software. These include cuts, wipes, fades, and special organic effects (soft- or hard-edged), plus an infinite range of flips, tumbles, picture-in-picture, page peels and image wrapping.

- 24-bit real-time framegrabbing from composite or S-Video.
- Professional quality genlocking.
- Real-time, live-video color processing and chrominance effects
- High-quality Digital Video Effects

New Features:

- Now includes powerful, VLSI microcode processor "Roaster Chip" for Digital Video Effects of unequalled quality.
- Luminance keying with definable upper and lower levels
- Chroma keying on any color range
- 256-level "Alpha Channel" (transparency) key.
- 24-bit, 35ns character generation software
- 24-Bit Picture-in-Picture and Video Sandwich Keying

Included Software:

- Opal Character Generator
- Special Effects Manager
- OpalVision System Software

Inputs/Outputs:

- 1 Composite in/out
- 1 S-Video in/out (S-VHS, HI-8, Y/C)
- 1 expansion connector for Video Suite
- 1 RGB out via DB-23 connector



Includes OpalPaint and OpalAnimMATE for state-of-the-art painting and 24-bit animation.



Opal Roaster Chip creates unlimited Digital Video Effects and Transitions.



Alpha Channel functions with OpalPaint and with the Video Processor for transparency overlays.

The OpalVision Video Suite

A power-packed video and audio mixing, switching, and transcoding device. This 19-inch, rack mountable unit is so advanced that it has its own internal computer and every aspect is software-controlled for precisely timed and accurate functionality. The Video Suite includes a wealth of inputs and outputs. There are 9 video and 10 audio inputs available, plus the 24-bit frame store. Professional quality video inputs and outputs are available simultaneously in RGB or Y/R-Y/B-Y, Composite and S-Video. Choose any 2 sources from these inputs, assign a transition or special effect, and then trigger it manually or automatically. All of the transitions and effects provided by the OpalVision Video Processor are available for use by the Video Suite.



A, B and Preview display LED

Audio Level VU meters



Audio Inputs Sound F/X or 5th Audio input Stereo output RGB or Y/R-Y/B-Y inputs and master sync input 4 Composite and 4 S-Video inputs Preview composite and S-Video outputs Main composite and S-Video outputs Main RGB or Y/R-Y/B-Y and sync outputs Key in/out OpalVision input/output Power Connector

The linear transparency key (Alpha channel and transparency effects) can be taken from the Video Processor or an external video source, and/or output to another production switcher. This allows transparency control between 2 video sources on a pixel by pixel basis. The 10 Audio inputs (5 stereo pairs) are fully software sequenced with smooth fades and full, 5-band stereo frequency equalization.

Video Inputs:

(All available simultaneously)

- 4 composite inputs (8 composite inputs if S-Video inputs are used as composite)
- 4 S-Video inputs (S-VHS, Hi-8 or Y/C)
- 1 or 2 RGB or Y/R-Y/B-Y inputs (2nd source uses the 4 composite inputs)
- 1 master sync input (master sync can be selected from any video source)
- 1 infinite level linear transparency key

Video Outputs:

- 1 composite main output
- 1 S-Video main Output
- 1 RGB or Y/R-Y/B-Y main output
- 1 linear transparency key
- 1 composite preview (automatically transcodes composite & S-Video)
- 1 S-Video preview

Audio:

- Inputs: 10 mono or 5 stereo pairs
- Output: Stereo with 5-band equalizer and VU meters

OpalVision Scan-Rate Converter

Add this card to the OpalVision Main Board and achieve 31kHz, non-interlaced output of Amiga graphics, OpalVision images and any incoming source in either PAL or NTSC. And, we've added full time-base correction of incoming video. Time base correctors are used to synchronize two non-synchronized video signals, or for cleaning up the timing of a "dirty" video signal. The on-board memory also serves as a separate frame-store for dual framebuffer applications.

- Converts interlaced PAL and NTSC to 31kHz non-interlaced, flicker-free display.
- Plugs into the OpalVision Main Board. No external power supply needed.
- Works with any multi-sync/multi-scan monitor.

New Features:

- Includes full, infinite window Time Base Correction
- Operates in RGB for superior quality

Video Performance

Video Input Standards (User selectable):	NTSC, NTSC 4.4, PAL, SECAM
Video Output Standards:	NTSC, NTSC 4.4, PAL
RGB output Bandwidth	>7 MHz
Composite (Luma) Bandwidth	4.5 MHz typical
S-Video Bandwidth	5.5 MHz typical
Hue Control	+30 to -30 degrees
Video lock jitter	<15ns
Horizontal position adjust	-320 to +1000 ns
Horizontal lock range	+/- 1200Hz typical
Subcarrier lock range	+/- 350Hz minimum
Linear Keyer input speed	>7 MHz

Audio Performance

Audio Inputs	10 inputs (5 left, 5 right) line level 20k ohms
Audio Outputs	2 outputs (Left, Right) line level 70 ohms
Input Mode	Differential for very low noise
Frequency Response	20Hz - >20kHz
Frequency Equalization points	59 Hz, 205 Hz, 790 Hz
2.95 kHz, 12 kHz Equalization Range	+/- 15db
Total Harmonic Distortion	0.05 % typical
Mixing level control	0 to -70db (independent software controlled DAC's)
VU meters	10 steps -20db to +30db range

Amiga 2000/ 3000/ 4000 Compatible



Created by:
Opal Tech
Sydney, Australia

Manufactured and Distributed by:
Centaur Development
P.O. Box 4400
Redondo Beach, CA 90278

For information:
1-800-621-2202
Phone: (310) 542-2226
FAX: (310) 542-9998
BBS: (310) 793-7142

REVIEW

Professional-level multimedia development package for Amiga and CDTV lines.

AMIGAVISION PROFESSIONAL

Commodore Business Machines, \$399 (\$99 upgrade for AmigaVision owners).

Hard-drive installable.
Not copy protected (freely-distributable player included).
2.0/3.0 compatible.

Accelerator compatible.
Minimum system: 2MB of RAM.
Recommended system: 4MB of RAM and hard drive.

I've used AmigaVision for many projects, and while it has its limitations, it is still a powerful tool for creating interactive multimedia. For professional-level development, where you need sophisticated capabilities such as a wide variety of math functions, database capability, and free-form buttons, "AV" is by far the easiest program for creating presentations. It is simply one of the most powerful multimedia development systems available anywhere. Now, Commodore has done one better: AmigaVision Professional solves most of the original version's shortcomings.

NEW AND IMPROVED

One of AV's biggest problems has been its lack of a distributable player. It has also needed an easy way to launch an AV script upon bootup—essential in kiosk applications. To launch a script, you've had to double-click on its icon. AV Pro solves these problems by including a distributable player that you can use to launch a script from a startup sequence or CLI. You also can launch the editor so that it comes up with a playing script.

Display capabilities have been greatly improved. Support for AGA graphics (A1200 and A4000 display modes of 256 colors and 256,000 color HAM mode) has been added, with some current limitations: You can't color-cycle or modify AGA images from within AmigaVision (such as changing the palette); and when using the Object Editor to create an object to place on an AGA picture, you can use only the first 32 colors in its palette. You can, however, place full-color brushes on them.

More picture transitions are now available—34 in all. The requester separates them into two groups: Half of them work with transitions between pictures

with differing palettes and resolutions; the other half are for pictures that have identical palettes and resolutions. Not all transitions work well with AGA graphics, but plenty are available. The ability to call a random transition, which formerly required extra programming, is another welcome addition.

In interactive presentations, flexibility in the creation of buttons is very important. Even powerful programs such as Scala Multimedia 200 have limited button capability, and you are restricted to creating only rectangular buttons. In AV Pro, even an animbrush can be a button. And you can import a brush for this purpose, or use the improved drawing tools in the object editor to create one.

FLYING OBJECTS

With the new path creator, you can create and edit paths for buttons and objects to follow, with control over speed and movement along the path. For example, an interactive button could take the form of a bird flapping its wings and flying back and forth across the screen. You also now have control of object depth, so your bird could fly behind one button or object and in front of another. As a simple test, I created three AnimFonts (animated brushes of letters) moving around the screen, on circular paths. Each was a separate button. The arrangement worked perfectly, and was impressive.

Often, large animations can take a few seconds to load. To speed things up, ANIM streaming—which plays the ANIM as it is loaded, saving both memory and time—has been added. You can set the size of the buffer for streaming ANIMs.

Besides the standard Amiga graphics, AV Pro now supports the CDXL animation format for CDTV. You can even play a CDXL file within a window moving along a path. In fact, AV Pro is a powerful CDTV development system, with full support of CDTV functions such as automatic highlighting and support for the B button on the con-

To locate the vendors of the products reviewed, see the "Manufacturers'/Distributors' Addresses" list on p. 92.

WS

troller as a "back" button. You can even play tracks from audio CDs and audio sections from a CD-ROM.

Audio has been significantly improved: MIDI, which was limited to four channels in the original, now supports up to 20 channels; sound now supports streaming.

The Object Editor has been spruced up too, with a new paint-program-style menu bar, rather than a pull-down type. It is easier to use, and includes a button for dropping the menu out of the way to reveal more of the screen.

One of AV Pro's big changes is in object handling. Objects (anything you create in the Object Editor, or load in) can be named, are addressable by name, and can be manipulated from anywhere within the script. Objects can be addressed through the Expression Editor, and functions can be used to determine when an object moves to a specific position. You can add, load, clone, or delete objects, and their attributes can be directly manipulated with variables for sophisticated interactive applications.

Referencing requesters, which let you refer to another icon elsewhere in the script, have been changed. You can now reference an icon directly, or use a computed reference based on an expression.

Developers creating presentations for distribution or kiosks now have the option of limiting an application's memory use. If the kiosk system has 5MB but you have 12MB on your development machine, you can limit the system to 5MB (or any preset

amount), or default to CDTV memory limits.

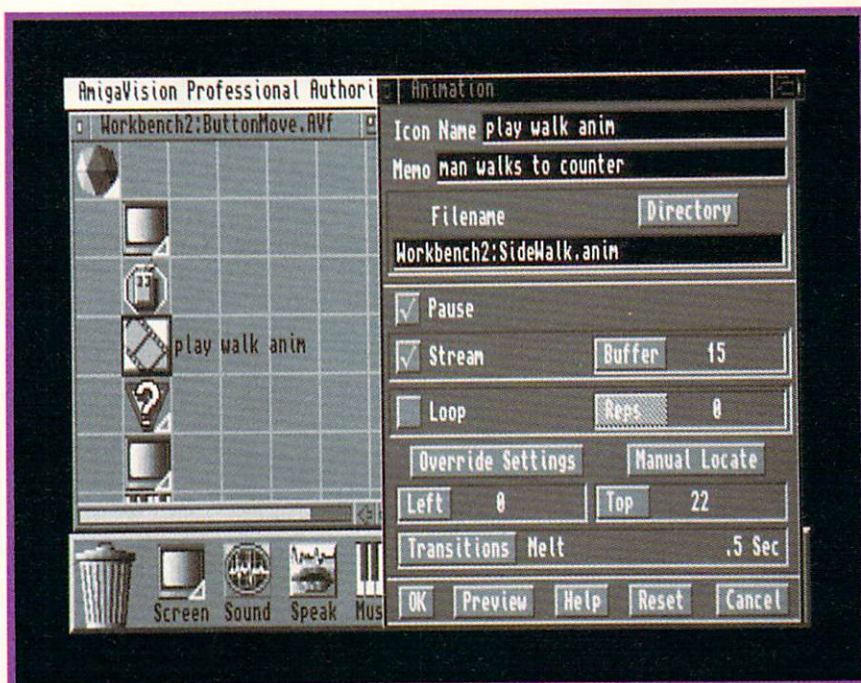
Other additions include conditional interrupts, variable-definition checking, external port communications without using ARexx, available memory checking, a customizable pointer, and manual location of animations, screens, and brushes.

MY WISH LIST

I'd like to see a few more things: ARexx control over objects and attributes would be useful; the Animation requester should include the option of playing an ANIM and holding the last frame; complete support of AGA—all resolutions; better support of new synthesized-speech capabilities. Overall, though, I am impressed with the new features.

While a number of other interactive-development tools are available (and I have them all), AmigaVision Professional will be my primary tool. Besides being very powerful, it is also very easy to use and has the best interface of any available multimedia package. If interactive multimedia is an area of interest to you, you can't afford to be without AV Pro.

—Geoffrey Williams



AmigaVision Pro's main screen gives you access to many new features.

ONE-STOP MUSIC SHOP

Blue Ribbon Soundworks, \$649.

A2000, A3000, A4000.

Internal, expansion slot connection.

Installation: Easy.

Hard-drive installable software.

Not copy protected.

2.0 (and up) compatible.

Accelerator compatible.

Minimum system: 1MB of RAM

Recommended system: 1+MB of RAM, hard drive.

Sample player and MIDI interface for multimedia producers and composers.

Electronic musicians will note well the introduction, a few years back, of the easy-to-use Proteus, a single-rack space MIDI sound module featuring 32-note polyphony and great ROM sounds.

Now, with Blue Ribbon SoundWorks' One-Stop Music Shop, Amiga owners can have a Proteus built in to their computer. At its heart is the actual sound engine from the Proteus, piggybacked onto an expansion card usable in an A2000, 3000, or 4000 card slot. Also onboard is a MIDI interface with MIDI in and out ports separate from the serial port.

OTHER FEATURES

Software includes a full-blown editor for the sound engine, an ARexx-controllable MIDI file player with several demo MIDI files, tools that allow One-Stop ▶

to be used with Bars and Pipes Pro and as a stand-alone source, a PatchMeister driver, and a demo of SuperJam 1.1.

The sound engine is essentially a ROM-based sample player with 213 sampled waveforms, which are used as sound sources and manipulated in a basic synthesizer-like architecture. The resulting sound is defined as a preset, which can be saved to disk. Output is via a pair of RCA jacks on the back panel of the card.

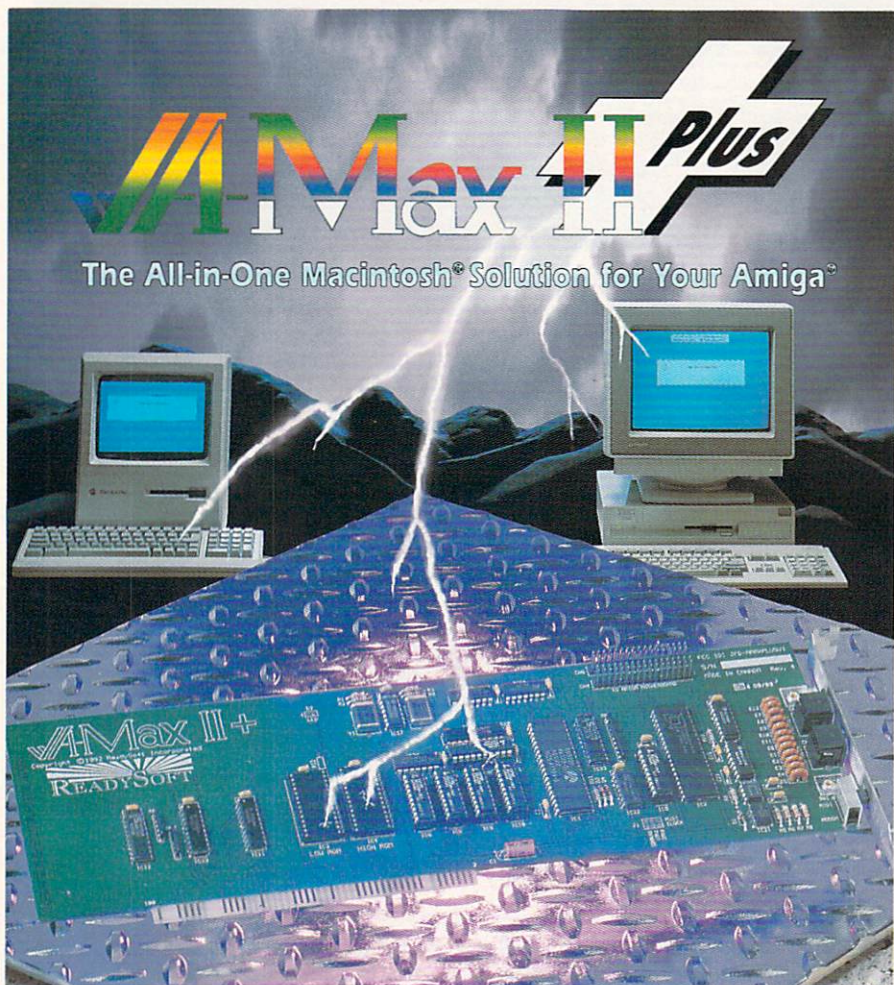
A preset is made up of two waveforms—the “primary” and “secondary”

instruments, which can be modulated separately by two low-frequency oscillators (LFOs) and an envelope generator. Each instrument can then be shaped by its own dedicated envelope generator. The sound engine packs some unusual features: Crossfade, rather than playing primary and secondary instruments simultaneously, gradually fades from one to the other; Sound Start lets you start a sound from any point in the sample; Reverse plays the sample backwards.

The sound engine's architecture be-

comes clear once you begin working with the editor. The signal path is displayed in the main window with buttons representing modules with editable parameters. The three basic modulation sources (LFOs 1&2, and the auxiliary Envelope Generator) are at the left of this screen. Each LFO offers five waveshapes (sine, sawtooth, triangle, square, and random), with the typical amount, rate, and delay controls—not so typical is a variation control. Three buttons (Key/Velocity Control, Realtime Control, and Miscellaneous) let you define modulation sources and destinations.

Click either the primary or secondary instrument buttons and a window containing these parameters appears. Click



The All-in-One Macintosh® Solution for Your Amiga®

The Wait is Over ...

The addition of A-Max II Plus to ReadySoft's acclaimed series of Macintosh emulators brings powerful new capabilities to your Amiga. A-Max II and A-Max II Plus are hardware and software combinations that, once you supply Macintosh 128K ROMs, run almost all Macintosh productivity software at full speed including Word, Excel, Quark XPress® and Illustrator®. A-Max II Plus is an internal card which may be easily inserted into a slot in your Amiga 2000 or greater series computer. Once installed, A-Max II Plus provides AppleTalk®, serial port, MIDI and disk compatibility with the Macintosh.

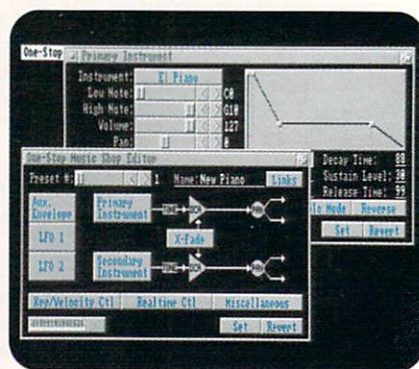
The A-Max 2.5 software also features: support for Amiga hard drives, mouse, keyboard, disk drives, serial and parallel ports, processor accelerators, RAM, all normal video modes and screen sizes, de-interlacers, playback of Macintosh digitized sounds, Apple ImageWriter® emulation for 9 and 24 pin Epson® compatible printers, and access to Macintosh SCSI peripherals through a hard drive controller's SCSI port.

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Richmond Hill, Ontario, Canada L4B 1B9
Tel: (416) 731-4175 Fax: (416) 734-8887

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One-Stop Music Shop spreads its controls over multiple windows.

in the instrument box to scroll through all of the sampled waveforms to select the one that will be the basis for this sound. Below are sliders to set instrument range along with volume, panning, tuning, start point, and delay (up to 13 seconds). At right is a graphic envelope to set the instrument's dynamic shape.

A “Chorus” button uses MIDI doubling to double the number of voices for a chorus effect. The Link button lets you combine up to four presets in either layers or zones across the keyboard range. A small keyboard representation lets you audition the sound.

MAKING MUSIC

One very attractive feature is the fine integration with other Blue Ribbon products. Aside from the stand-alone One-Stop editor, there is an accessory version for Bars and Pipes Pro that, once loaded, runs from inside the program.

Sound engine in and out tools are placed in the pipeline to access the sound engine sounds, and a separate set of MIDI in and out tools is used to address the MIDI interface resident on the One-Stop card. A General MIDI tool can also be placed in the pipeline to send

program changes to the sound engine. This tool sends patch numbers 0-127 while displaying a corresponding General MIDI Standard patch name. The stock sounds in the sound engine also conform to the GM spec.

The sound engine is also supported by Blue Ribbon's universal patch librarian, the PatchMeister, which lets you organize and manipulate sound engine patch banks, and can also be run as an accessory in Bars and Pipes Pro.

Using the Loop Back tool, the sound engine can also be used with other sequencers or as a stand-alone sound source. This entails routing the MIDI out from the Amiga MIDI interface or from your master controller to the MIDI in on the One-Stop interface.

SuperJam (version 1.1 and higher) works very nicely with One-Stop. When SuperJam senses One-Stop, it automatically replaces the turbo sound option with the sound engine and redirects MIDI communication through the One-Stop interface, freeing the serial port.

CONCLUSION

I have only one small complaint: You can't disable an incoming MIDI channel; every channel is assigned a sound. Though this should be a problem only for non-Bars and Pipes users with multiple sound sources and controllers—I could suggest a work-around such as creating a "zero" patch—a channel-specific data filter would be a helpful addition.

Nevertheless, this is an excellent product. It's especially useful for multimedia applications, but anyone making music with an Amiga could make good use of One-Stop. This is definitely one of the best Amiga music products that I have seen so far.

—Steve Quinzi

IMAGEFX

Great Valley Products, \$399.

Hard-drive installable.

Not copy protected.

Accelerator-optimized version included.

2.0 compatible; supports AGA.

Minimum system: 1MB of chip RAM.

Recommended system: 4+MB of RAM, hard drive, enhanced-display adapter, accelerator.

Image processing, 24-bit painting, special effects, scanner support, and polymorphic animation control.

In film and video, two currently hot topics are morphing and image processing. Fanning the fire, ImageFX in-

corporates extensive image processing, file-format conversion, image retouching, scanner and framegrabber support, as well as single, dual, and sequence morphing animation controls. The program gives you all this control over 24-bit true-color images, plus alpha-channel support, a clean intuitive interface, and generally fast execution.

I rarely start a review on such a glowing note, but these programs (ImageFX also includes CineMorph) are something to get excited about.

ImageFX imports Alias, ANIM, BMP, DPIX, FLI, FLC, GIF, ILBM, Impulse, JPEG, PCX, PPM, PMG, Amiga and Windows Icon, RAW, Rendition, Targa, TIFF, DCTV, and HAM-E files. You can load them into the main buffer, a swap buffer, or the alpha channel. You can grab screens, place images in the clipboard, load brush images, scan from the Sharp JX100 or the Epson ES3000, or grab frames with GVP's IV24 or Progressive Peripherals' FrameGrabber.

Images can then be rendered to de- ▶

Now Introducing

RETINA

List Price \$599⁹⁵ w/2MB



Retina™ - 24Bit Frame Buffer and Workbench Emulation

Output: DB-15 VGA Connector - Analog RGB output Supports 15 - 75KHz Hor. Freq. and 50 - 95 Vert. Freq. 800x600 full 24Bit 16.7 Million color Display Non-Interlaced. Allows multiple 8, 16, and 24Bit Resolutions.

Full Workbench Emulation with resolutions such as 1024x768 or 1280x1024 in 16 colors or even more! Up to 2400x1200! Compatible with Amiga 1950, 1960 and VGA and up monitors.

Ram Configurations 2 Megabytes or 4 Megabytes. 4MB allows double buffering for animations.

Compatible with the A2000, A3000, and A4000 series Amigas. Installs into any 100 pin Amiga slot does not use the video slot. Compatible with the Video Toaster and OpalVision.

XIPaint is a realtime 24Bit paint program that comes with the Retina™.

The Retina™ can still be used to display 24Bit graphics while emulating Workbench.

Compatible with programs such as AdPro, Morph Plus, MultiFrame, TVPaint, ImageFX, ProPage, ProWrite, PageStream, DynaCadd, Imagine2.0 to name a few.

The Retina™ requires the 2.0 or greater operating system.



List Price \$499⁹⁵



VLab™ - RealTime Video Digitizer

Digitizes a full frame in 1/30th of a second or 1 field in 1/60th of a second. Digitizes in full Broadcast NTSC or PAL. Will save images as 24Bit, YUV, or any Amiga format including AGA modes like Ham8.

The VLab™ has 2 Composite Video inputs.

The VLab™ will work in the A2000, A3000 and the A4000 series Amiga Computers and does not use the video slot.

There is also a VLab1200 that allows owners of the A1200, A500, A600 to also use the VLab™.

The VLab™ does not require a frame accurate video player to hold the image still to digitize.

The VLab™ will in real-time digitize any frame from the video source that you have connected.

You can digitize images from cable TV, Broadcast TV, VCR, Video Disk Players, and Video Cameras.

The VLab™ is supported by popular Graphics software such as ASDG's Art Depart™ Professional, TVPaint by TechSoft, MultiFrame by MacroSystemUS.

There is a special monitor window that allows you to see the video signal that you have attached to the VLab in a window on the VLab screen in up to 16 gray scales.

The VLab™ software requires the 2.0 operating system or higher and is fully ARexx compatible.

The VLab™ is compatible with the Video Toaster, OpalVision, Retina™, and Harlequin.

The VLab™ is also supported by the Nucleus Personal SFC.

MultiFrame for AdPro

Controls both ADPRO and MORPHPLUS operators from ADPRO. Perform ADO-style fly-ins of moving images easily. Multiple frame/Multiple Ripples, allowing ripples that start at different times that accelerate/decelerate over time. Create panning/tilting camera effects on still images or sequences. Direct display to supported framebuffers.

MacroSystemUS

Mt. Clemens, MI 48038
(313) 263-0095 Phone
(313) 263-9639 Fax

Circle 157 on Reader Service card.

vices such as Impulse's Firecracker, Centaur's OpalVision, IV24, a SAGE display, Digital Creations' DCTV, Black Belt's HAM-E, or to any Amiga display, including the new AGA resolutions. ImageFX displays a working full-screen image using the standard grayscale or color Amiga display for fast feedback, which is very helpful when your image is larger than the display area.

GRAY MATTER

ImageFX offers all the basic painting

and touch-up tools, along with "Magic Scissors," which helps you pick up brush areas without the background. While I would prefer a tool to provide an easily modifiable stencil, the manual suggests that you use the alpha channel as a frisket or stencil to protect areas.

The alpha channel is a 256-shade grayscale image you can use to control effects on the 24-bit image, without necessarily altering color values of the image. Areas that are closer to white in the alpha channel have a greater effect

than those that are closer to black.

While this may sound confusing, the quality of the effects can be remarkable. The water-drop effect in the accompanying photo, created with an ImageFX special effect, was accomplished using the alpha channel to generate the alteration.

Other tools provide control over the image, as well, including color balancing, contrast, antialiasing, color limits, scaling, sharpening, and edge detection. There are also special effects for distortion (based on the alpha-channel image), waves, oil transfer, and others.

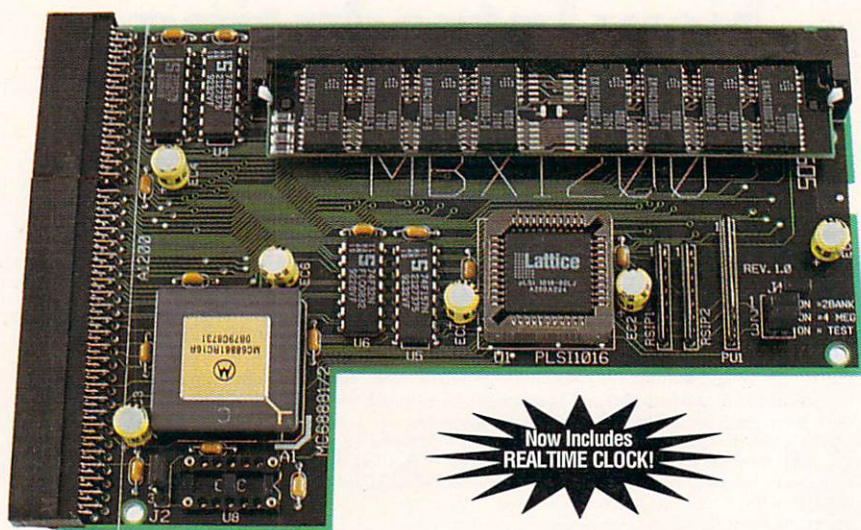
ImageFX fully supports ARexx and has add-on modules called Hook programs, which you can use in conjunction with image processing to add even more special effects, such as Black Hole, Spiral, and Explode. The Hook approach lets you add new modules without upgrading to a completely new program.

MORPH MAGIC

One of ImageFX's Hook programs is CineMorph. Briefly, morphing is the ability to create transitional frames by controlling the movement of specific points of the start image to match those of the end image. The beginning and ending could be the same image, two different images, or a series of images as required for a full-motion morph.

The single-image morph is easiest to explain: Think of a picture on a sheet of thin rubber. When you poke your finger at the back side of the rubber, the picture stretches and distorts. You can create this same effect by moving the end points of the morphed image outward in a circular pattern that is about the size of your finger.

This example can be much more detailed and can be utilized over a series of images. ImageFX uses a grid pattern of points to control the begin and end points of your images. Your work area is two side-by-side windows that contain grayscale versions of the start and end im-



MATH CHIP AND WIDE RAM MBX 1200 FOR THE NEW AMIGA 1200

MicroBotics is *first* in the field with high quality, affordable expansion for your new Amiga 1200. By installing MBX 1200 in the 150-pin expansion bay of your Amiga, the 1200 realizes its full potential—with hardware floating point math and up to eight megabytes of 32-bit FastRAM. Standard on the MBX 1200 is a Motorola 68881 clocked at motherboard speeds (14.3MHz). This feature alone will speed up math intensive operations by as much as 55 times (AIBB v5.0 Savage benchmark). If you do any ray-tracing, image manipulation, morphing or animation, such hardware floating point is a must-have feature. MBX 1200 is also available with a 25MHz or 50MHz 68882. Add on an optional 72-pin SIMM memory module to MBX 1200 and average system performance will increase to 193% of a standard A1200 (or to 688% of a standard A500!). SIMM sizes supported: 1,2,4, or 8 megabytes. SIMM type is identical to that used in the Amiga 4000. Don't buy sluggish, 16-bit wide "credit card" RAM—it actually *slows down* your 1200! Get true 32 bit wide, zero-wait state FastRAM access via MBX 1200 for maximum system performance. The SIMM is easily installed thanks to the top quality, metal latch connector found on MBX 1200. MBX 1200 is a low-power, highly integrated multilayer board, made in the U.S.A. MBX 1200 is a plug in and go expansion; no complex setup required. Software includes MBRTesT-2, a comprehensive system memory test, and MBXRAM8, a "credit card" toggling utility for eight megabyte installations. **Available now from your Amiga dealer.**

MicroBotics, Inc. 1251 American Parkway, Richardson, TX 75081

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Circle 6 on Reader Service card.



Combining ImageFX's alpha channel and effects controls yields stunning results.

IT HAD TO HAPPEN...

We put the creators of Deluxe Paint ST™, Deluxe PhotoLab™, and DCTV Paint™ together with the goal of developing the most awesome paint and animation software ever for the Amiga. After many man-years of inspired design and programming, it is simply... **BRILLIANCE!**

IT'S AMAZING...

By far the best paint program ever created for the Amiga. Paint and animation features you wish you had before are here now. You can paint and animate in virtually every Amiga graphics mode including all of the new AGA modes! Brilliance also has a unique true color mode allowing you to create and modify full fidelity 24 bit pictures. Your Amiga has never shined as bright as it will with **BRILLIANCE.**

IT'S POWERFUL...

Multiple levels of UNDO allow you to experiment without fear. Written in assembly language for the quickest response, smallest program size and the most sophisticated features. A rich set of drawing modes will unleash your full creative potential. Multiple paint and animation buffers can be worked on at once, limited only by memory. The more memory you have, the better Brilliance becomes. Power, features, sophistication, ease of use, Brilliance has it all.



IT'S EASY...

The user interface was designed to put YOU in control, not the program. Quickly and precisely control all paint and animation features with the dynamic menuing system. It gets out of your way at the press of a button. A help window assists in identifying controls as well as current modes. The

BRILLIANCE™

PROFESSIONAL PAINT & ANIMATION



Artwork by Jim Sachs. Created at 640x480 in 256 colors on an Amiga 4000.

stacking menu bars can be user configured and recalled with function keys. You can even save your own configurations.

IT'S BRILLIANCE...

Once and for all, in one easy to use package, the total paint and animation system for the Amiga.

Best of all, it's from Digital Creations.

Works with all Amiga models.

Minimum memory requirement: 1 Meg.

Graphics modes supported:

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Circle 63 on Reader Service card.

ages, respectively, with the grid superimposed over them. Points can be added, deleted, grouped, and locked in place points, but unfortunately cannot be hidden.

For detail work, you can zoom in on the images. Point movement can be linear or by spline curve, and you can control point-movement acceleration and dissolve speeds both globally or on a local point-grouping basis.

Perhaps the best feature is that the morphing calculations are quite quick,

although speed is, of course, dependent on your system, the image complexity, and the number of control points. In addition, this version of CineMorph lets you call another processing function and save the results in any of the supported file formats.

Another major feature in ImageFX is the use of virtual memory. If you don't have enough RAM to handle the processing for a large image, ImageFX uses your hard disk as virtual RAM. While this is slower, you can still complete your project.

I manipulated an 8MB image on my 9MB machine with only a small difference in processing time from smaller images.

PROS AND CONS

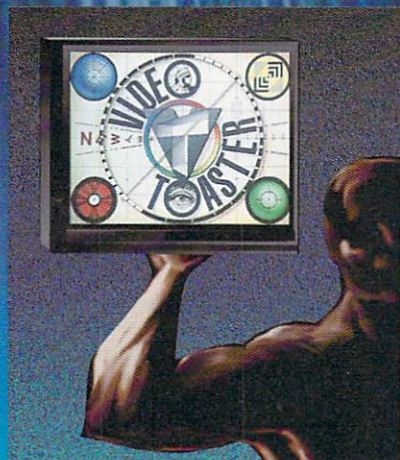
I was quite impressed with ImageFX; it has a better user interface, wider file support, and more features than its competition. The documentation, while well written and well indexed, is unfortunately incomplete. It does not explain many of the parameters used for special effects, and the tutorials refer to pictures and projects not included on the disks.

If you are looking for flexible image-processing and morphing capabilities, you will want to consider adding this one to your disk of tools.

—Steven Blaize

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DirectoryOpus's claim to fame is its configurability. With this latest release even more flexibility is available.

The list of new enhancements for ver-

Continued on p.26

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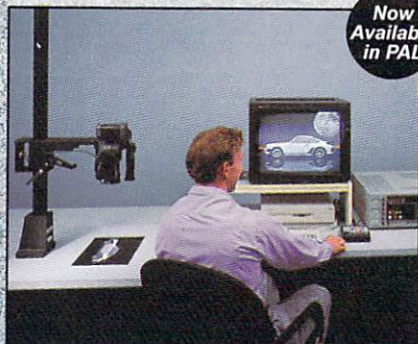
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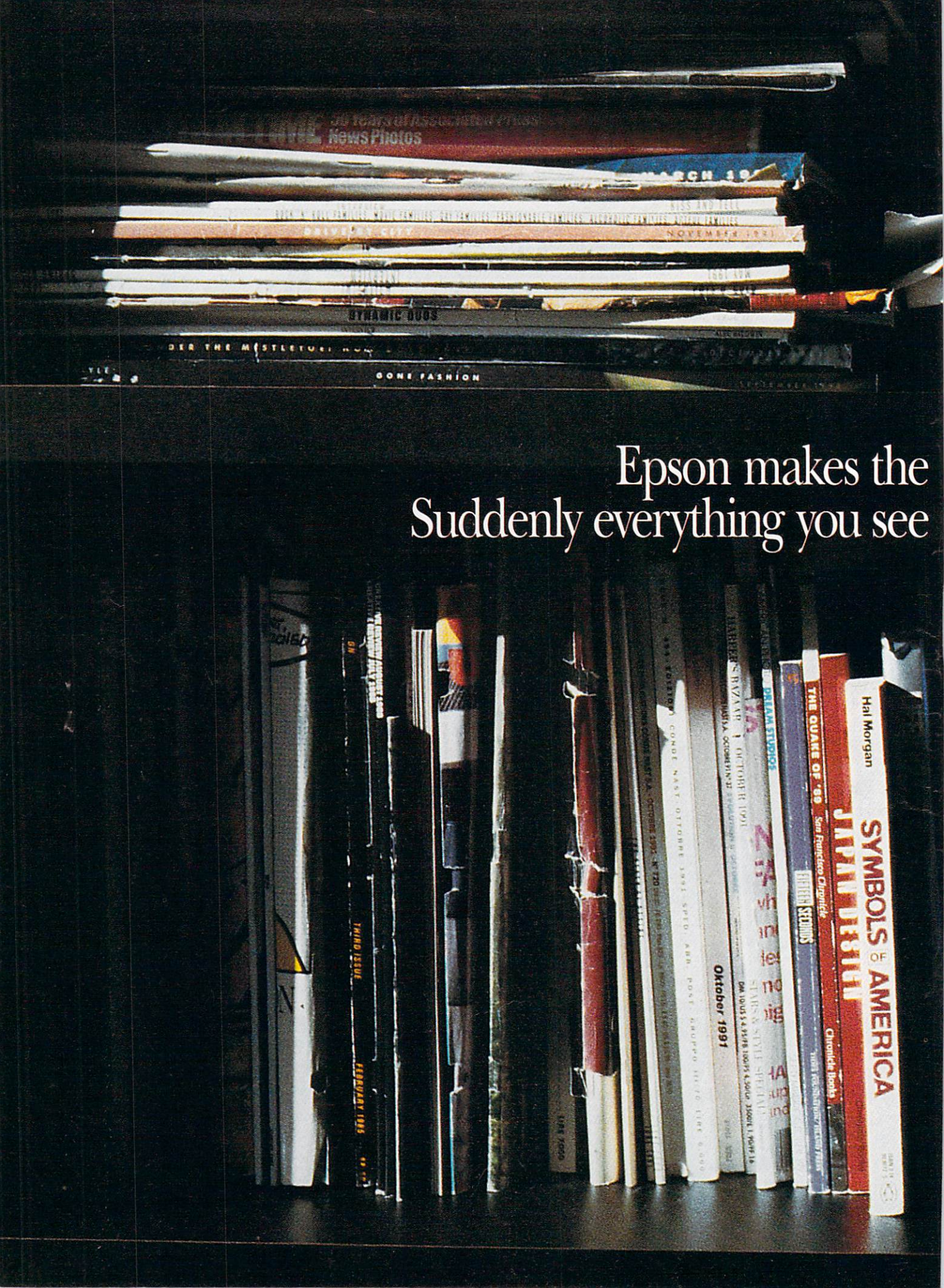
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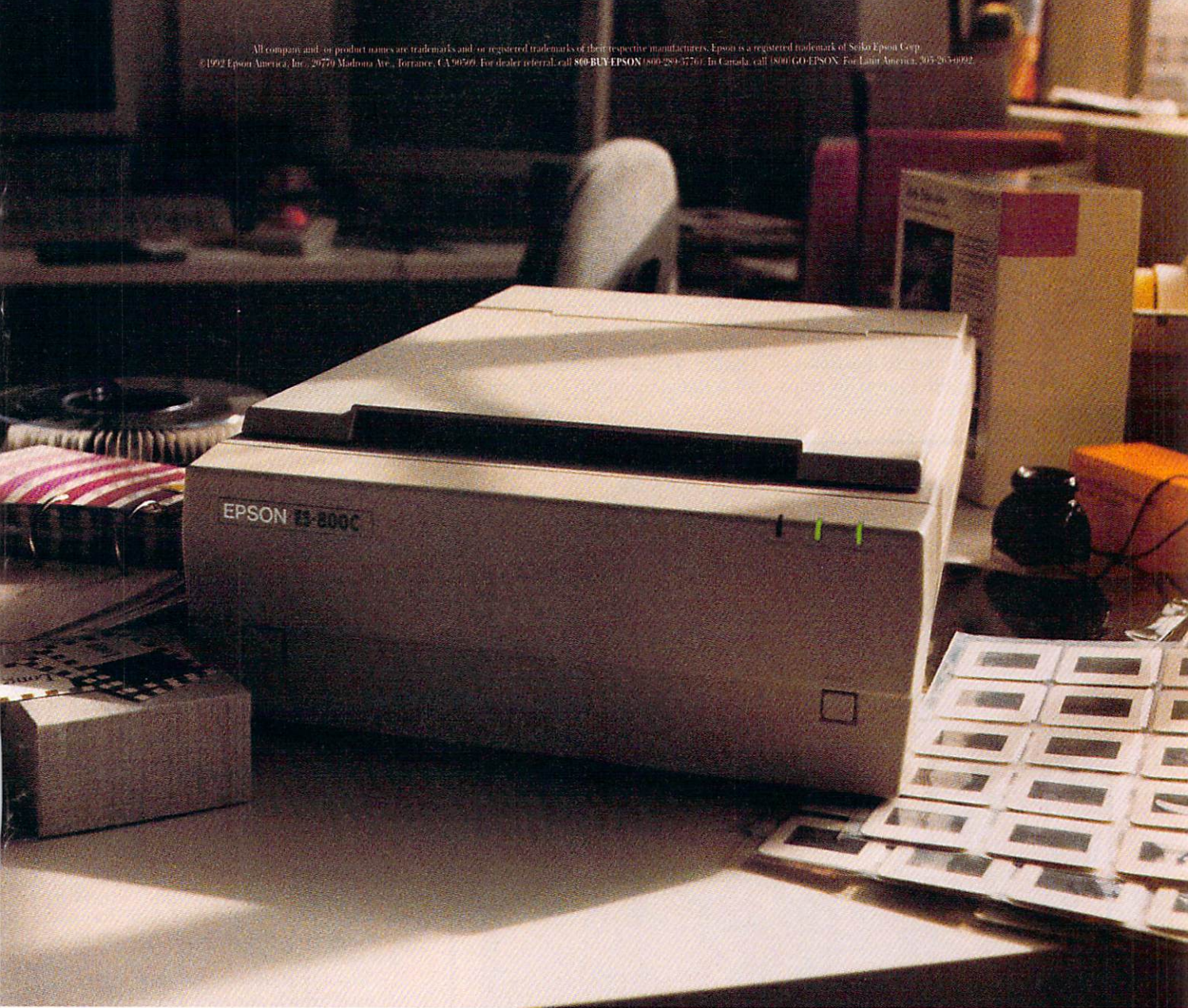
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As with any database, Address-It! lets you sort through your data in several ways. You can use a proportional gadget at the bottom of the main screen for casual browsing. Or, use one of the numerous ways to locate specific records, most of which have hot-key shortcuts.

A unique search feature in Address-It! is controlled by the 15 initially emp-

ty boxes on the main screen. Click the Define gadget below them, and you can enter a text string, which then appears in one of the 15 boxes.

For instance, if you're in charge of your user-group's newsletter, you could fill these boxes with different system configurations. Make one A500, one A2000, one for hard drive, and so on. Now, each of the 15 boxes is a flag that you can toggle on or off for each record. As you enter members' names, click the appropriate flags that define



Address-It! gives you quick access to your address-book records.

their systems. With just a couple of mouse clicks, you can later send customized notices to only the subgroups that would be interested in them.

In addition to mailing labels and index cards, Address-It! also generates address and phone pages and envelopes. Requesters let you specify either standard or custom page sizes, and the program shows you a preview of your layout. You can print envelopes with or without a return address or an attention line. All of the forms allow you to choose which information fields are printed, and you can change the field length to fit your data.

Address-It! also imports and exports data in WordPerfect, ProWrite, and ASCII formats, so you can import a list of customers from your database, select certain groups, and then output the data to a mail-merge word-processor document, all without retyping your names and addresses.

The only drawback is the 40-page manual, which appears to have been hastily duplicated and trimmed so close that parts of some letters were cut off. The documentation is still readable, but the printing and binding job needs improvement.

Address-It! is a flexible, easy-to-use program. I look forward to the forthcoming inventory and invoicing programs that will interface with Address-It!. These additions should make it a complete business package.

—Rob Hays

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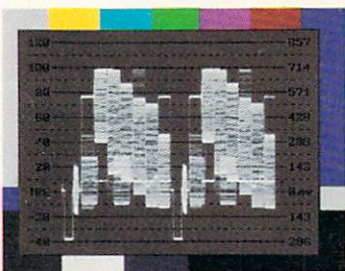
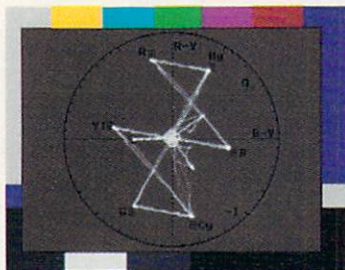


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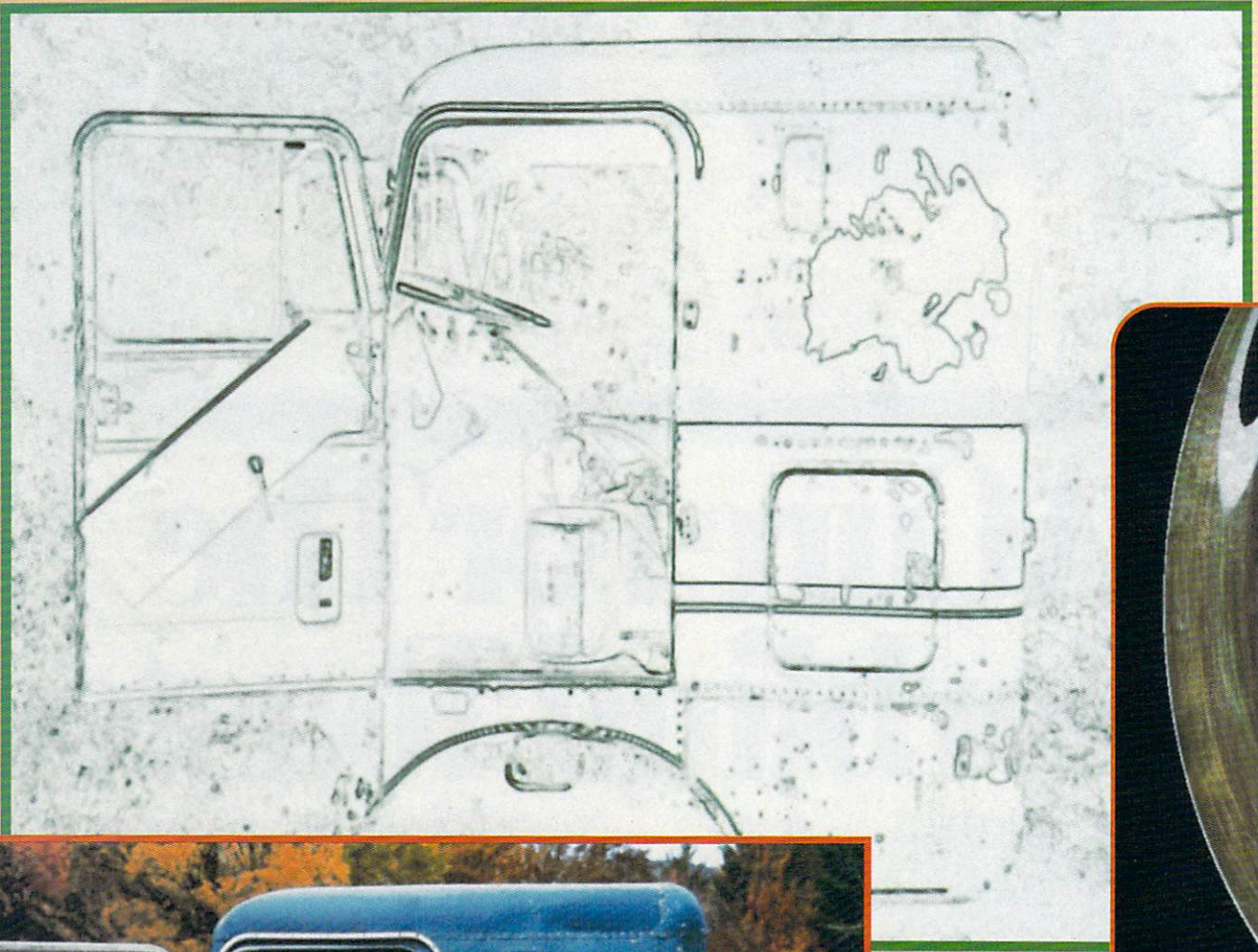


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THE GREAT



Heredity isn't everything, as the images above demonstrate. Both derive from the photo (lower left). At top, ADPro's Line Art effect brings out subtle outlines; at right, the program's Swirl function puts a whole new spin on things.

MANIPULATORS

BY DEREK GRIME

TODAY'S COMPUTER ARTIST has a freedom the traditional artist cannot even imagine. Traditional media are permanent, but computer pictures can be mixed, blurred, sharpened, converted, and enhanced. Furthermore, computer artists need not start from scratch with each work. With image-processing software, you can instantly apply effects to any images, including digitized photos.

Lately, much has happened in the realm of Amiga image processing. Before you put cursor to screen image, you should know how the available tools stack up. What are the programs' strengths and weaknesses? Which package gives the best dollar value? Which offers the most features? And most importantly, what is the right choice for you?

In seeking the answers to those questions, I reviewed what were, at press time, the latest releases of the Amiga's three main image-processing programs: **Art Department Professional 2.2** (\$299, *ASDG*), **Imagemaster 9.23** (\$199.95, *Black Belt Systems*), and **ImageFX 1.03** (\$249.95, *GVP*). (To locate the vendors of products mentioned in this article, see the Manufacturers'/Distributors' list on p. 92.)

ASDG's The Art Department followed the Amiga's first wave of image processors—PIXmate (now out of production) and Butcher (now part of Eagle Tree Software's authoring program Helm). Since upgraded to Art Department Professional, ADPro introduced the new wave of image processing. It has earned its good reputation, and ASDG continues to improve it; version 2.3 may be out by the time you read this.

ADPro's first challenger was Imagemaster. The program has an incredible range of features, and Black Belt constantly releases upgrades. In fact, Black Belt ►



*Amiga image-processing software
is continually evolving, allowing
you to alter more images
more skillfully.*

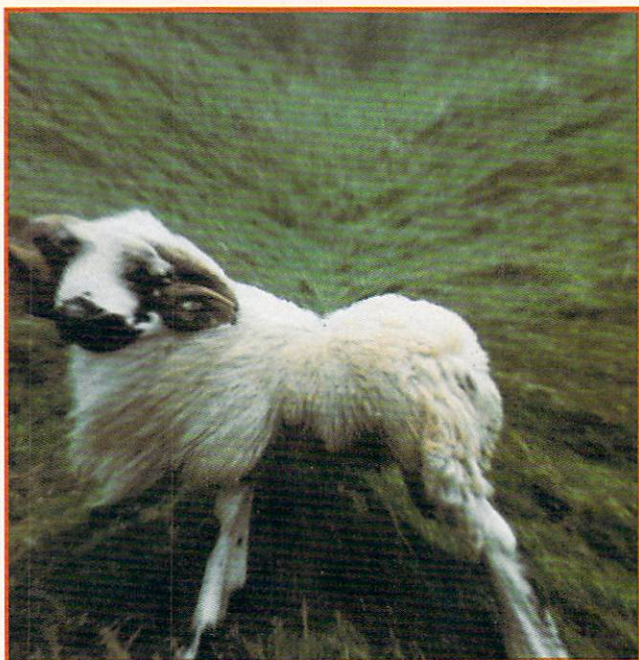
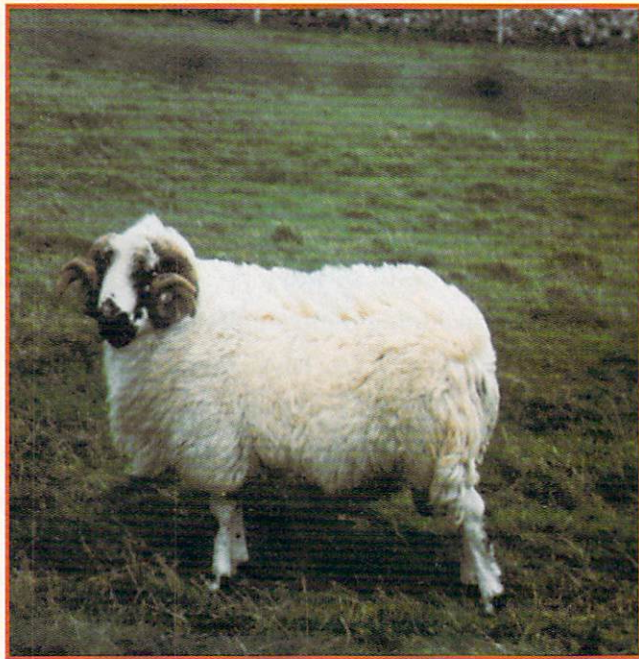
was promising imminent release of Imagemaster 9.24 as we went to press.

The new kid on the block, GVP's ImageFX, was released in late '92. ImageFX is far more than just a picture manipulator. GVP has packed in so much value that ImageFX must be considered by any serious user.

Let's start our exploration of the programs' differences by comparing their file-format finesse.

GRAPHICS IN, GRAPHICS OUT

Before processing an image, you must load it into



Imagemaster's Caricature operation gave the original sheep (above) an hourglass figure (below).

your software. While Amiga users are lucky to have just one major file format with IFF, the rest of the world is dogged by a maze of differing formats. On a DOS machine you may run into TIFF, GIF, Targa, and BMP, to name just a few. To make matters worse, formats often come in different versions. A TIFF file saved from a paint program may not load into a desktop-publishing program, and vice versa.

Why does this matter to Amiga users? Because you want to be able to draw from as many sources as possible. We've included a matrix (see the sidebar "Reading, Writing, and...") which shows how the trio fares in terms of loading and saving various picture files. Keep in mind that support for dozens of formats looks impressive on paper but unless the software supports all the format's variations, results can be disappointing.

For these tests, I used two different programs on an SGI workstation to generate 24-bit files in four formats each: Targa, GIF, TIFF, and Alias. I then attempted to load the eight files into each of the three Amiga programs. I used the auto-load features of both ADPro and ImageFX, which automatically try to decipher the format of the file; Imagemaster has no such feature and requires you to specify the file format before loading.

ADPro performed like a pro; while it does not support Alias, its universal-load feature recognized each of the three other formats automatically.

ImageFX supports all four of these formats but could read only the GIF and TIFF files automatically. It recognized and loaded the other pictures only after I specified their formats.

Of the four formats I tested, Imagemaster supports only Targa. It could not, however, read any of the test Targa files correctly. While it did attempt to load the files, the results were nothing like the originals.

All three of the programs performed well when writing files. The workstation software could read all the pictures the Amiga programs generated, although Imagemaster's Targa output was marred by vertical lines.

ASDG claims that ADPro is "image processing's common ground." It certainly comes close. Not only does ADPro support more image formats than its two competitors, but the program makes an effort to support all the formats' many permutations. ASDG should be applauded for a job well done. There is a cost for such flexibility, however. Support for Targa, TIFF, Sun Raster, and other higher-end formats is not standard, but requires the purchase of ASDG's Professional Conversion Pack (\$90).

THE LEARNING CURVE

If you're the type of person who hates to read manuals, then either ADPro or ImageFX is your best choice. While ImageFX employs simple icons for many of its functions and ADPro goes for a push-button approach, both programs provide easy-to-use, intuitive interfaces.

Imagemaster is not so straightforward. It requires you to dig for the functions you want to use. For example, to solarize a picture you must go from the main panel to the process panel and then to the special-effects panel where you click on the solarize option and then flip back to another panel to define the

area to be processed. The program gives you access to lots of power, but makes wielding it trickier than it has to.

Manuals are important and ASDG has provided the best of the group. At more than 300 illustrated pages, it is well written and comprehensive. ImageFX comes close with more than 200 pages, including an immense AREXX reference section.

Imagemaster's manual is adequate, though it does not explain every aspect of the program. A ReadMe file on the program disk contains more than 250K of information. That's 110 pages! You are supposed to print this monster and add it to the manual. (Apparently, a lot has changed since the initial release.) Black Belt knows this is a problem and is working on a new manual, but it's cold comfort to a new user faced with hours of printing. Despite this weakness, Imagemas-

ter's is the only manual that includes examples of processed pictures so you know what your results should look like.

CONVOLUTIONS AND TRANSFORMATIONS

Once a picture is loaded, all three programs can work miracles, yet each approaches the same process with a different attitude. ADPro offers a full-screen control panel and does all its magic out of sight on a background screen. ImageFX and Imagemaster provide half-screen panels that allow you to see the processing as it happens.

There is much overlap in functionality among the three. One program may refer to a feature by the name "collapse" while another calls a similar feature "the black hole."

ADPro has a large range of tools and lets you choose ►

READING, WRITING, AND ...

The more image formats and equipment a program fully supports, the more flexibility it offers. While the main article details my experiences with each program's format support, *this* matrix shows the range of loaders, savers, and device drivers the software provides.

IMAGE FORMATS:

LOAD	ADPro 2.2	ImageFX 1.03	Imagemaster 9.23
Abekas	B		
Alias		Y	
ANIM	C	Y	Y
BMP	Y	Y	Y
DKB			Y
DPaint IBM	Y	Y	
DigiView21	Y		Y
GE MRI			Y
GIF	Y	Y	Y
IFF	Y	Y	Y
Imagine	Y	Y	Y
JPEG	Y	Y	Y
NASA JPL, FITS, PDS			Y
MacPaint	Y		Y
PBM		Y	
PCB			Y
PCX	Y	Y	Y
PICT	D		
QRT	Y	Y	Y
Rendition	A	Y	Y
Sculpt	Y	Y	Y
SunRaster	A		
Targa	A	Y	Y
TIFF	A	Y	Y
XWindow	A		
YUVN	Y		

SAVE	ADPro 2.2	ImageFX 1.03	Imagemaster 9.23
Abekas	B		
Alias		Y	
ANIM	C	Y	Y
BMP			Y
DPaint IBM	Y		
GIF	Y	Y	Y
IFF	Y	Y	Y

SAVE (cont.)

	ADPro 2.2	ImageFX 1.03	Imagemaster 9.23
Imagine	Y		Y
JPEG	Y	Y	Y
PBM		Y	
PCX	Y		Y
PICT	D		
PostScript	Y	Y	
QRT	Y		
Rendition	A	Y	Y
Sculpt	Y	Y	Y
SunRaster	A		
Targa	A	Y	Y
TIFF	A	Y	Y
XWindow	A		

DEVICE SUPPORT:

	ADPro 2.2	ImageFX 1.03	Imagemaster 9.23
A2410	Y	Y	
Abekas	B		
Amiga1200/4000	Y	Y	Y
DCTV	Y	Y	Y
Film Recorder	B		
Firecracker	Y	Y	Y
Framebuffer	Y		
Framegrabber	Y	Y	
HAM-E	Y	Y	Y
Harlequin	Y		Y
IV24	Y	Y	Y
OpalVision	Y	Y	E
Printers	Y	Y	Y
Resolver	Y	Y	Y
Scanners	B	Y	
Vivid24			E
VLAB Digitizer	Y		

KEY:

Y = Yes—program provides support
A = Available with Professional Conversion Pack.
B = Available as a separate product from ASDG
C = Now available in MorphPlus; promised for ADPro2.3.
D = Promised for next version of ProConversion Pack.
E = Promised for Imagemaster 9.24



values on separate control panels for many of the operators. These panels allow for precise adjustments and make ADPro a natural when doing fine-tuning for print or video. Operators include blur, collapse, line art, tile, and twirl. ASDG's MorphPlus (\$295) works with ADPro to give you several additional operators. Incidentally, MorphPlus is ADPro's ticket to full-motion morphing, which is standard with Imagemaster and ImageFX. ADPro is fast, often much quicker than its competition.

ImageFX has many similar operators and makes them somewhat less involved by giving you limited control over each operation. If you don't want to operate on the whole picture, ImageFX makes it easy to choose a portion of the picture to work on. GVP also adds some standard paint tools (such as magnify) and sports an undo button. In addition to providing such basic operators as blur and sharpen, ImageFX offers extra features via the Hook tool. Through "hooks" you can measure pixels and produce histograms, counting the red, green, and blue content of the image.

Imagemaster ups the ante considerably by adding more functions and filters than the other two combined. This is Imagemaster's true strength: dazzling effects that the competition hasn't even dreamed of. No where else can you find droop, contour, caricature, thicken, zig-zag, shine, blueprint, melt, and dome options. And there are many, many more. You can even add fake geographic elevations to an image or use a picture to create a real elevation map that can be loaded into VistaPro (Virtual Reality Labs) and rendered as a landscape. Everything you can do with ADPro and ImageFX you can presumably do with Imagemaster by combining its numerous special effects. Keep in mind that some of these nifty tools take a long time to process the picture. All in all, though, Imagemaster has the best bag of tricks.

A nice touch is each program's provision of batch processors that let you alter entire groups of images any way you wish.

IF YOU ACT NOW...

There is more to this group than just image processing. For instance, all three programs include full ARexx ports that allow you to create new functions and modify existing ones.

The troika works with the entire range of Amiga displays. Oddball formats like SHAM (high-res HAM) are here, as well as the new AGA and HAM8 modes offered by the A1200 and A4000. There is good support for third-party display cards such as Impulse's Firecracker 24, GVP's IV24, and Digital Micronics' Resolver, and all work with DCTV (Digital Creations) and HAM-E (Black Belt) as well.

The three programs let you print directly; ImageFX and ADPro can even save in PostScript and En-



The original image (top) underwent somewhat revolutionary changes thanks to Imagemaster's Relief function (center) and ImageFX's Oil Transfer effect (bottom).

capsulated PostScript formats. Furthermore, each one creates text slides that you can save as IFF files.

If you need to create images from scratch or just do touch-ups, Imagemaster and ImageFX include full paint programs that are well integrated with the rest of the functions. Imagemaster's paint module has the most features, but the ImageFX offering most resembles a standard Amiga paint program and is simpler to use.

Of the program versions I reviewed, only ImageFX had built-in drivers for scanners. (Imagemaster's upgrade, which is due out by the time you read this, promises support for Epson's ES300, 600, and 800 units.) ImageFX's Sharp JX100 and Epson ES300C support is a generous bonus; in my tests the JX100 driver performed flawlessly. ASDG offers support for a much wider range of scanners, but at a higher cost. An ADPro driver module for Epson scanners is \$200, and one for HP's ScanJet IIc is in the works. ASDG's Professional ScanLab II, which drives Sharp units, is \$499.

Only ASDG offers separate products that support professional film recorders like Polaroid's CI-5000 and Lasergraphics' LFR. ASDG even sells ADPro modules that drive dye-sublimation printers and control Abekas digital-videotape recorders directly from the Amiga. Support for the Abekas is sure to be a crucial element in getting the Amiga into even more high-profile video post-production houses.

Standard equipment on ADPro are the programs Splitz and Joinz. If an image is too big to fit on a disk, you can use Splitz to break it into disk-size parts and Joinz to reassemble them. ADPro also includes IBM (DOS and Windows) and Mac versions of these two utilities so you can swap images with your friends on other platforms.

Finally, all three companies offer on-line technical support (via modem) to registered users.

WHAT'S RIGHT?

There are good *raisons d'être* for all three programs. Each is stronger in some way than its competitors, and each suits a different type of user.

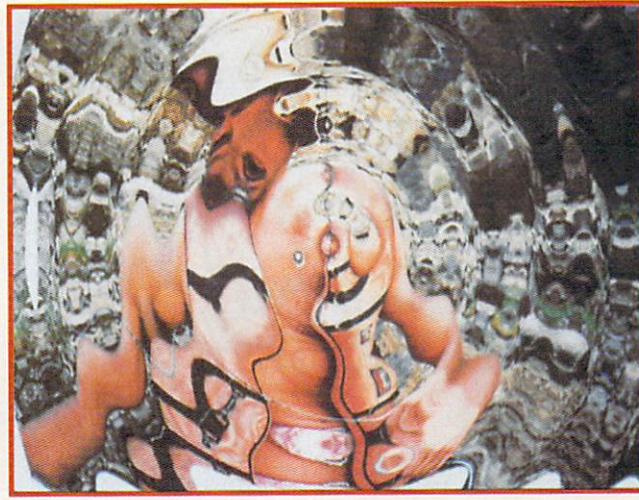
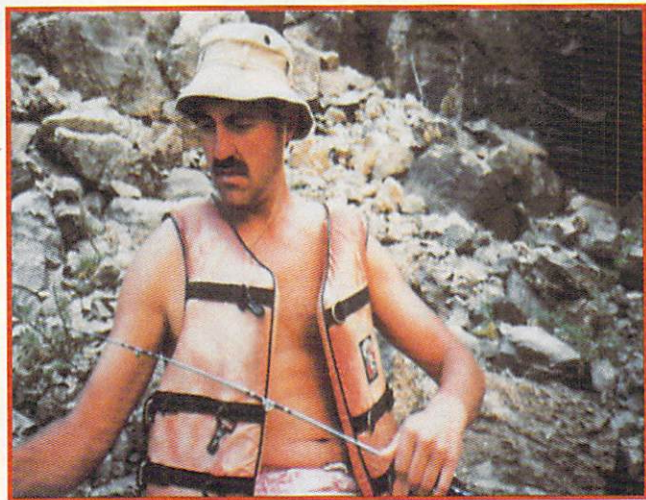
For the experimenter, the avant-garde artist who craves wilder and stranger special effects, I recommend Imagemaster. If you run a video boutique or post house you must buy this program. It excels when creating outrageous images, the type you see in music videos. Imagemaster does demand more from its users, but if you persevere it can outperform anything else. The exterior is an ugly duckling but the soul is solid gold.

If you run a small studio and want an all-in-one solution with good value, then purchase ImageFX. I feel the program's Cinemorph module represents the most elegant morph solution of the three, and it's included here for free. Plus, you get a powerful 24-bit paint program, lots of effects, and built-in scanner support. It's easy to use and you can be up and running in minutes. It also offers the most natural interface. When I use ImageFX, I feel as though I am transforming the image, not just sitting back and letting the software do all the work. If a quick solution is what you need, you can't go wrong with ImageFX.

Despite the strengths of the other two programs, Art Department Professional is the strongest of the three. It gets the nod because it does what it claims to do. To its credit, ASDG has done the job right, supporting formats correctly and adhering to standards the others have only touched on. If you ever transfer files back and forth to other systems, you must have ADPro or risk ending up with egg on your face. ADPro is much more expensive when you factor in MorphPlus and the Professional Conversion Pack, but you do get what you pay for. It's a solid value, despite its premium price. You will find uses for all three programs, but ADPro is the one you will turn to in a pinch.

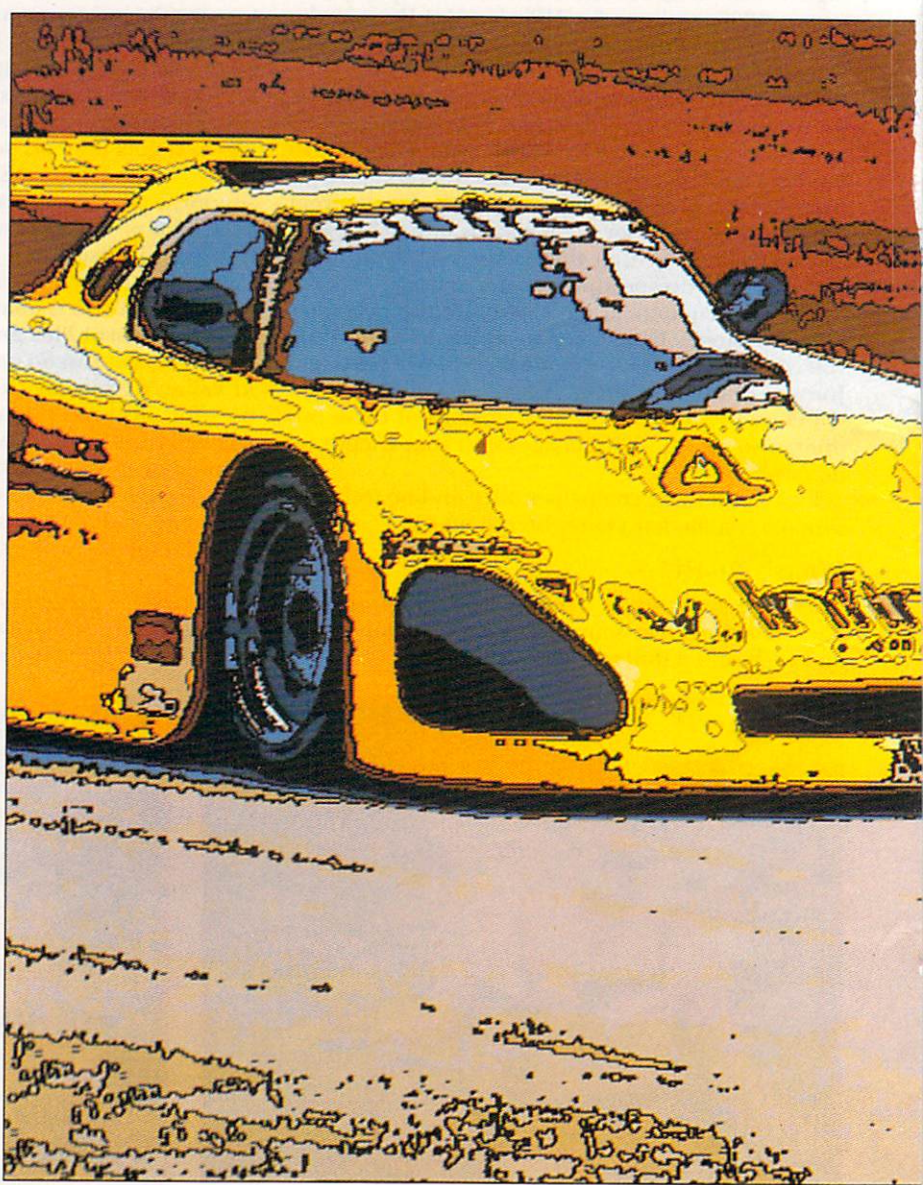
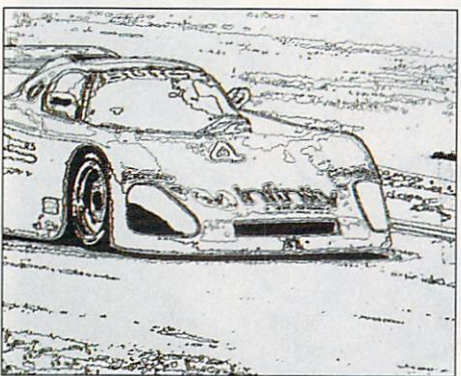
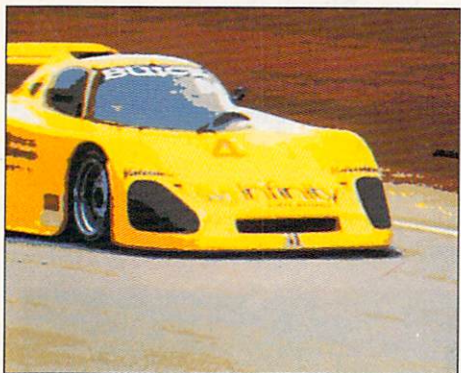
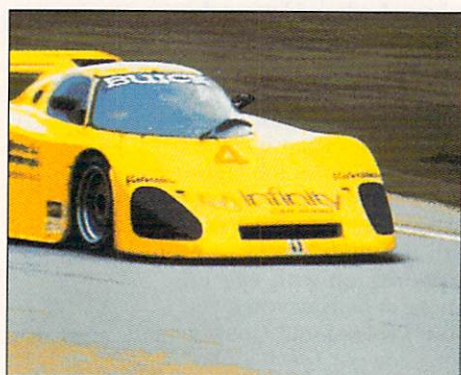
And hey, if your bank account can take the strain, get all three. Imagemaster has the flash, ImageFX has the range, and ADPro has the precision. As a trio they cover all the bases and then some. ■

Derek Grime is president of Beyond Graphics, a Toronto-based animation studio that recently finished work for Fox, Froot Loops, 7UP, and Commodore.



Did the fisherman in the photo (left) catch a big one (right)? Sorry, Charlie, it's Imagemaster's Radical Wave effect. (Photo credit: Nancy Gefvert.)

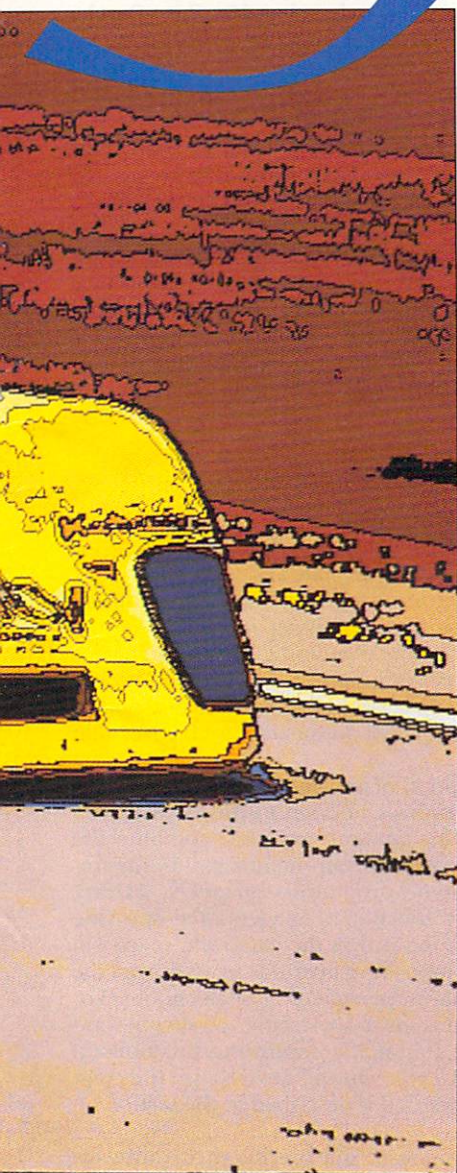
Graphics...



Outline Posterization: After the original color picture has been digitized (top left), posterize the image into fewer colors with flat color areas (middle left). Then, having created an outline version of the image (bottom left), composite the two images into the finished graphic (right). All operations for this example were done with Digi-View 4.0.

with

Flair!



If you're looking for some slick, snappy-looking tricks to liven up plain-vanilla graphics, check out these image-processing techniques for creating outlined posterized graphics.

LIKE EVERY MAGICIAN, a computer artist needs a few tricks up his sleeve. Image processing offers some excellent opportunities for conjuring up such magic. The techniques presented in this article will show you how to perform some digital prestidigitation on an ordinary grabbed or digitized image and transform it into an outlined posterized graphic with artistic flair.

You've got a wide array of choices when it comes to finding the necessary tools to perform your magic. Any one of the following seven popular graphics and image-processing programs will do the trick: PIXmate (Progressive Peripherals), DeluxePaint (Electronic Arts), NewTek's Digi-View or Transfer 24 (provided with Digi-Paint 3), Art Department Professional (ASDG), ImageFX (GVP), and Imagemaster (Black Belt).

Our tutorial will take you through all seven programs, step by step, to demonstrate how each one produces its effects in different ways. So, no matter which one you choose to use, you'll know the trick to making it perform your bidding.

Before we begin, though, keep this in mind: Selecting a suitable subject for your magic is extremely important. Outline posterization works best on an image with large elements. Too many small details will confuse the issue. A close-up of one or two flowers works far better than a picture of the whole flower garden. Image sources might include a digitized photo or slide, a grabbed frame of videotape, or an image from a graphics-library disk. The technique works with images in any format—from 16-color to 24-bit—so the only limiting factor is whether your software is capable of ►

By Fred Hurteau

handling that particular format. (The chart in "The Great Manipulators" on p. 33 in this issue, lists all compatible image formats for ADPro, Imagemaster, and ImageFX.)

Posterizing

THE FIRST STEP is posterizing the image into fewer colors, introducing flat color areas with no dithering. HAM or 24-bit images should first be converted to 16 colors. Your completed image can later be used in a 24-bit program and still retain the posterized look. ADPro, ImageFX, Imagemaster, DeluxePaint IV AGA, and Digi-View 4.0 will load and convert 24-bit or HAM images, while DeluxePaint IV, PIXmate, Transfer 24, and earlier versions of Digi-View will convert HAM images only.

Digi-View or **Transfer 24** users should open the program in the screen size of the finished graphic. In the Control requester select the 16-color button and set Dithering to Off to enhance the posterizing effect of reducing colors. (The technique of not using dithering is one we will employ with all programs covered in this article—see Figure 1 for more details.) Load your 24-bit, HAM, 16- or 32-color image. For 24-bit images, start with contrast and brightness sliders set about -20. Click Display to see the effect. Adjust brightness and contrast as necessary for a good image. You can further reduce colors by using the slider in the Palette requester and then clicking Display. Save your posterized image to disk when done.

To use **ADPro**, load your image and set the Screen Controls buttons to the desired screen resolution and 16 colors. Set Dither to Off and render with the Execute button. Now save the 16-color image to disk.

With **Imagemaster**, this process becomes a multi-

ple-choice test. To scale HAM images up to hi-res, choose Scale To New Size and then make the appropriate selection for hi-res under Set Render Size. (Be sure to select No Dither for Set Dither Type.) To posterize your image, go to the Process Panel, select Special Effects, and then click Posterize and Entire Image. Set the Poster Levels slider for 16 colors or less and click Done. You can achieve a similar posterization using Contour under Filters. Set the Contour Interval slider to about 125-150 and click Done. To save the image, click on File I/O and then on Render to File.

For **ImageFX**, load your image and resize it if necessary using the Size/Scale option. In the Render menu, set the left Dither Options button to None and the Display Options color button to 16. Render and save the "Rendered Image" to disk. You can further reduce colors by selecting Posterize from the Color menu, setting the slider to less than 16 colors. Render as before, making sure the Dither button is set to None, and save this "Rendered Image."

With **PIXmate**, load your HAM image and choose HAM To 32 from the Color menu. Then select Reformat As [640x400] under the Effects menu to obtain the desired posterized image. You can posterize any image using Less Colors in the Color menu. Be sure to save your image.

If you use **DeluxePaint**, open the program in the screen format of your image. Then load your image and select Screen Format from the Picture menu. Choose Hi-Res and 16 colors and click Okay. When the requester asks if you want the image stretched or shrunk to fit the page, select Yes. Now save this converted image.

Outlining

AFTER POSTERIZATION, YOU need to make an outline version of the image, which may require gray-scaling first. Except for PIXmate and DeluxePaint, using the same program for gray-scaling and outlining after posterization requires saving and reloading the posterized image before continuing. If you don't, your program will use the original data still in memory, and you will lose your posterization effect. Because outlining in DeluxePaint is not automated, we'll cover that program last.

With the exception of Imagemaster's "Edge Line" option (which requires no compositing), after you create your outline version you must combine the posterized image and the outline image into the finished graphic. Some programs—ImageFX, ADPro, and the "Line Art" function in Imagemaster—provide for such compositing within the program, so we will examine their compositing methods as we discuss the outlining procedures for each of those programs. For the other programs (or if you decide you do not want to use the more complex compositing functions in ImageFX and ADPro), you will need to use the compositing procedure that is described in the section on DeluxePaint.

Before we move on to the specific procedures for outlining with each program, however, be aware that each one handles outlining in its own unique way and therefore each is capable of producing very different kinds of outline effects. Figure 2, a composite of three



Figure 1. Differing degrees of posterization are achieved by turning off dithering when reducing the number of colors in an image. With dithering off, there are hard edges and more abrupt changes between areas of different color—as opposed to lots of dithered pixels simulating color and shade transitions when dithering is on. The overall effect is more like a drawing than a digitized image.

different outline images of the same original, provides a graphic representation of this point.

PIXMATE: EDGE DETECTION

Load your posterized image and convert it to gray scale using Color Bias in the Color menu. Pull the S slider (saturation) all the way down and click Use. Then adjust the C (contrast) and I (intensity or brightness) sliders for a good image. Click Use after each adjustment. Don't over-adjust because you may lose the very parts of the picture you want outlined. Save this gray-scale image to disk in case you mess up in the next step. Do not overwrite the original posterized color image.

Next convert this gray scale to line art by selecting Image Process under Effects. Practically every button here will alter the edging process, allowing for an infinite variety of looks. For this project, set the Threshold slider to 0, the Limit slider to 16, and the Hits slider to 100%. The NOP (No Operation) box should be highlighted in the Logic section.

Under the word "KERNAL" there are seven characters, ranging from an asterisk to a slash mark. All of these effect edging, but use + (plus sign) as a starting point. Click the EDG box (edge detection) and PIXmate goes to work. When the light show is over you will have a black image with white outlines. For black outlines and white background select Compliment in the Color menu for a negative image. (Note: All the programs covered here provide in one fashion or another for a choice of outline color—black on white or vice versa—see Figure 3 for an example of both.) The Color Bias adjustments will increase contrast and darken grayed lines to black if desired before you save the outline image to disk. It's okay to leave some grays in the image; you can adjust them later with DeluxePaint when you assemble the posterized and outline images into a finished graphic.

IMAGEFX: EDGE DETECTION

Load your posterized image. In the Toolbox menu click Color and select Color To Gray, choosing the weighting you desire. Then click Okay. Once the image has been processed, render it with dithering set to None as before, and save the "Rendered Image." Now select Convolve and click Edge Detect. Try a setting of 30 on the Threshold slider and click Okay. If you don't like the results, the Undo button will restore your image. The Balance button allows adjustment of contrast (the Co slider) and brightness (the V slider). Using these and various Threshold settings will provide full control. You can try adjusting contrast and brightness after the edge detection is done to thicken faint gray lines into good black outlines. If you want white outlines, selecting Color and then Negative will reverse colors. Render and save the "Rendered Image."

Compositing this image with ImageFX can be a complex process, and less experienced users may wish to defer to DeluxePaint. If you do want to proceed, follow these steps: With the outline image still visible, go to Palette, click on Pick, and then click on the white background in the image. If the RGB sliders show R=255, G=255, and B=255, you're okay. If not, reprocess the image with more contrast until the background is pure white. When this is accomplished, click Color and then Gray To Color. If you don't do this, the compositing will not work properly. Now copy the im-

age to the swap buffer and load the color posterized image. Selecting Swap Buffers will allow you to view the outlined image again.

Now go to Palette, click on the whitest white in the palette, select Pick, and click on the image's white background. The RGB sliders for this color should read R=255, G=255, and B=255. Click the ranges or the All button until it reads R1. Make this white color in the palette a one-color range for R1. If this is done ▶

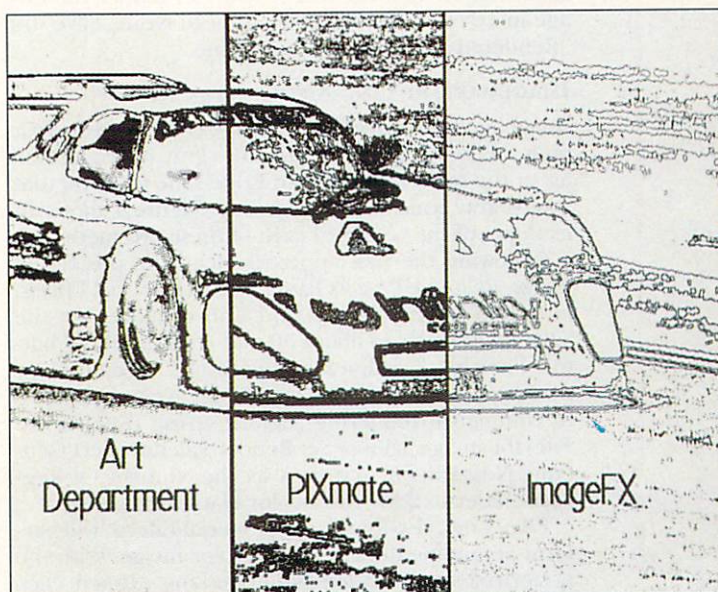


Figure 2. A composite of three outline images generated from the same original color picture of the race car from the opening illustration. Note how each program produces very different outline effects. You can also vary these effects within a single program depending on the settings for contrast, brightness, and other variables that you choose.

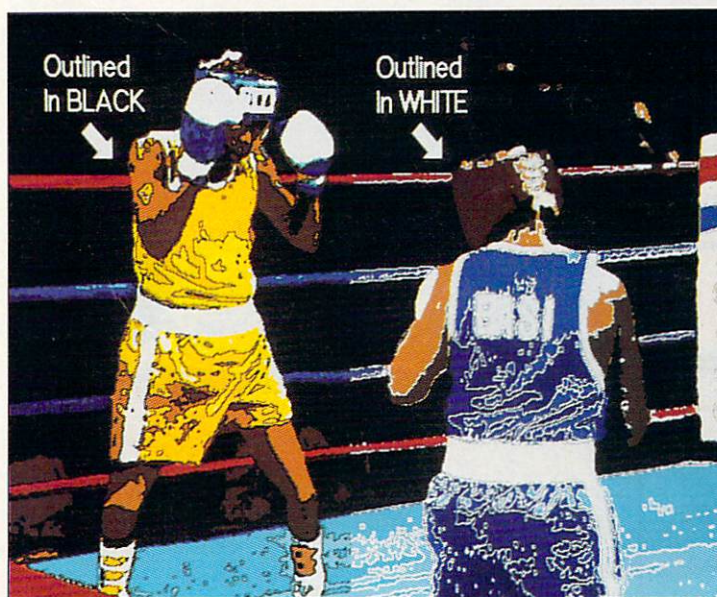


Figure 3. You can produce your finished image with either black outlines or white outlines, depending on the darkness or lightness of the color image.

properly, the white palette color will have a dash across it. If you have white outlines, substitute the black background color for the above operations and adjust values accordingly (R=0, G=0, B=0).

Go back to the Toolbox, click Composite, and select Matte. Using the Transparency controls, set the Include button for R1, the Exclude button for None, the Closeness slider for about 200 to 230, and then click Merge. Set the Merge Percentage slider for 100% and click Okay. When the merge is done, render the image in 16 colors with dithering set to None. Save the "Rendered Image" and you're done.

IMAGEMASTER: LINE-ART CONVERSION

Imagemaster again offers multiple choices, providing both a Line Art function that does gray scale and line art at the same time, and an Edge Line function that avoids gray scale and compositing. Figure 4 shows an example of the results of each of these two methods.

Following the first approach, load the posterized image, go to the Process Panel and click Special Effects, and then select Line Art and Entire Image. Set the Threshold slider to about 50 and click the B&W button. For a black outline click the Black Line button; for a white outline leave this button off. Now click Done to commence rendering. Before saving (Render To File) the image, choose Set Render Palette, select Generate New Palette, and then set the Number Of Registers slider to 2 for a two-color black-and-white file.

Edge Line, also found under Special Effects, will perform an outline directly on the color image. With the posterized image loaded and Edge Line selected, click B&W and try slider settings of Edge Line at 75% and Threshold at 20. The Black Line button functions the same as above. Click Done to render and save your image. That's all: No further compositing is required.

If you used the Line Art function above, Imagemaster can composite the images. Load the posterized im-

age first, and then load the outline image—selecting New As Secondary when the requester pops up. In the Compose Panel, choose Color Keyed Compositions and then Keyed Sec Max Rub Thru. Set the Red, Green, and Blue sliders all at 255 for a white background (black outlines), or all at 0 for a black background (white outlines). Set the Var slider at 20. Click Done and Entire Image. Be sure to choose Generate New Palette under Set Render Palette before rendering to disk (saving) the composited image.

ADPRO: LINE-ART OPERATIONS

Load your posterized image and set the Dither button to Off. Execute the Color_To_Gray operator for gray-scale conversion. Set the Screen Controls to the screen format of your finished picture, and the Color button to 16. Click on Execute to render the image to screen. If you need contrast or brightness adjustments, use the Balancing controls. Don't forget to use the Apply Map operator afterwards to make the new settings take effect. Render and save the color image (not the 24-bit image) to disk, and then reload it. This forces ADPro to work from the processed image, not the original image data.

Now select the Line Art operator and Execute Op. Render the outline image to screen. Again, you may want to adjust contrast or brightness to eliminate gray lines or make them darker. An optional way to eliminate grays is to set the Screen Controls Color box for two colors and rerender as a two-color image. Save your color image to disk for compositing next.

Be aware that ADPro's Line Art operator makes the image two pixels smaller vertically and horizontally, so care must be taken to properly align the images in the combining step. As with ImageFX, less experienced users will find that this type of compositing is simpler with DeluxePaint.

For ADPro to properly composite this project at all, you must load and resave the outline image through DeluxePaint. While in DeluxePaint, check the palette and set the background to pure white (all RGB sliders at 15) and the outline to pure black (RGB = 0), or vice versa. Now save this image over the original outline file. Return to ADPro and load the color posterized image first. Then click the Replc (replace) button, changing it to Comp (compositing), and load the outline image. The Composition Control requester will appear.

You must adjust the Offset X and Offset Y boxes to properly align the images. The amount of adjustment can vary depending on original image size and the available sizes within DeluxePaint. Usually an offset of 2 for both X and Y is correct. Set the Mix box to 100. At this point, the R, G, and B boxes will probably read -1. Delete these and type 255 in all three boxes, making the pure white background transparent during compositing. If you are using white outlines and black background, set the R, G, and B boxes to 0 and click on OK. The outline image will be loaded and composited with the color image. Render this composited image to screen. If the outline and color areas are not properly aligned, recomposite the two images with the Offset X and Offset Y adjusted to compensate for the shift you now see. When done, save the color image.

DIGI-VIEW/TRANSFER 24: OUTLINE ART

This is my favorite method for outlining. I can stop the ▶

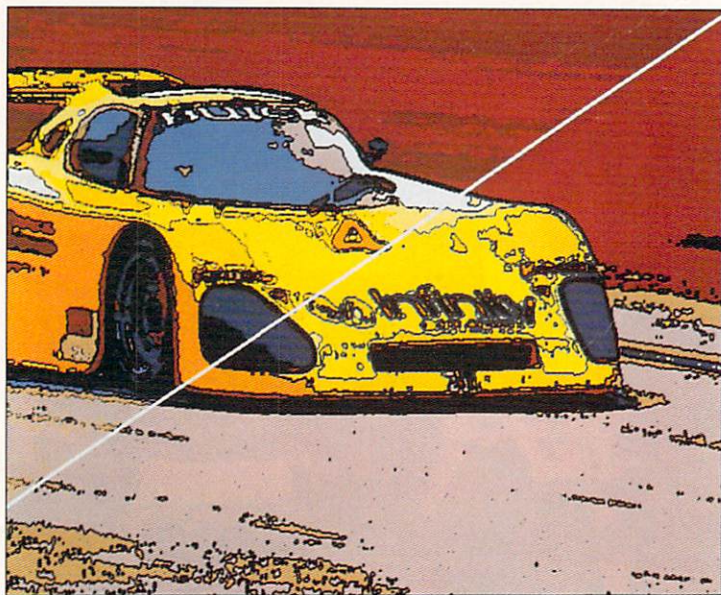
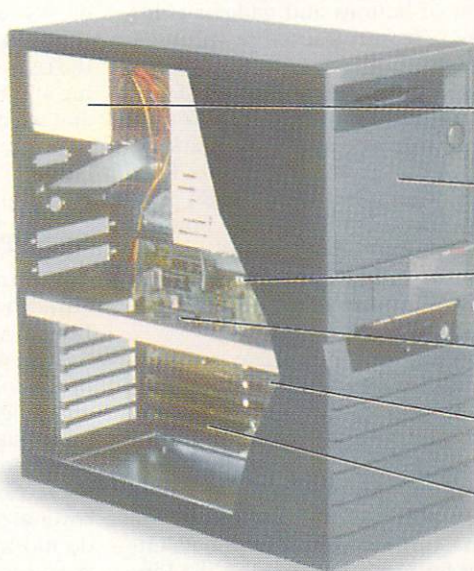


Figure 4. Imagemaster offers two distinctly different outlining approaches: The top-left area was done with Posterize, Line Art, and compositing; the lower right with Contour and Edge Line, which requires no compositing.

TIME TO GET SERIOUS.

SHUTTLE 2000 TOWER

The Shuttle Tower, manufactured by Eagle, transforms your Amiga 500 into a professional powerhouse. Four Zorro-II expansion slots, two PC compatible slots, video slot and processor slot make this great looking black (or beige) casing and detachable keyboard the piece of Amiga hardware every Amiga 500 owner has been waiting for. Together with the heavy duty power supply and four drive bays, you can now take advantage of all the upgrade possibilities offered to other Amiga users. The Shuttle Tower makes your Amiga a professional tool.



250 watt power supply

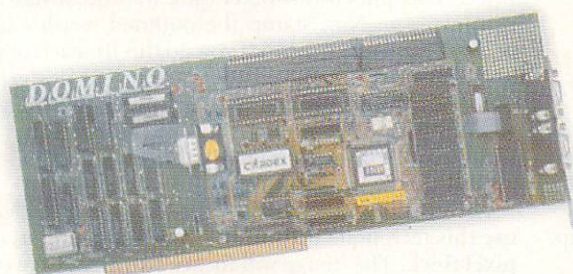
four drive bays

processor slot

video slot

five Zorro-II slots

two PC compatible slots



DOMINO

For those who want thousands of colors at an affordable price, Domino is just the board. With 32,000 colors, and a maximum resolution of 1024 x 768, this board is a real bargain. To make it even more attractive, every Domino board comes with free TV-Paint Jr., a 24-bit color drawing package with professional features, and the workbench emulator which will let you run your Amiga workbench and virtually all software in resolutions up to 1024 x 768. (De-interlacer required)



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FLink, the fastest AmigaDOS object file linker available today. FLink is a must for those who take programming seriously. FLink is compatible with any programming language that produces an AmigaDOS linkable file, and gives you linking times, independent of program size, of less than a second.

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process at any point with a mouse click and try different settings without undoing or reloading, making experimentation quick and easy. Novice users will find the simple sparseness of buttons and gadgets is less confusing than the more feature-packed programs already covered.

Open the program in the screen resolution of your color image and set Dithering to Off in the Control requester to maintain the posterized look. Click the Default button to ensure all sliders are at zero. Load your posterized image, select the BW button for gray-scale conversion, and click Display to see how the whole thing looks. Adjust the brightness and contrast sliders to suit your taste and save the image in case you mess up later. Be sure you don't overwrite the color version.

Click Default again and reload the gray-scale image, forcing Digi-View to use the new image data. Push the Sharp (sharpness) slider all the way up to 48. Now click Display and view the result. Adjust the contrast and brightness sliders to help eliminate gray areas in the image. This may also make the lines thicker. Click Display with each change to test your new settings. As a final option you can set the Palette requester color slider for two colors, or click the Line Art button for a two-color image. Save this outline art to disk.

DeluxePaint: Compositing...and More

DELUXEPAINT WILL EASILY assemble the color and outline images into the finished product. Experienced DeluxePaint users can find two or three ways to accomplish every step in this assembly process. Because some users may not have a one-meg Agnus chip, we'll use the most memory-efficient method.

Open DeluxePaint in the screen format of your color image. Load the black-and-white outline image first. If the message "Do you want to change format to that of file?" appears, click No. If the image contains grays, go to the the Stencil requester, click on the darker gray shades you wish to keep, and click Make Stencil. Select the brightest white (R=15, G=15, B=15) in the palette below your Tools menu as the current background color by clicking on it with the right mouse button. Now clear the screen. The light grays will be cleared to white, but the dark grays and black locked with the Stencil remain. If too many lines disappear, select Undo, lock some additional lighter grays in the Stencil requester, and try it again.

When the desired light shades have all been changed to white, go to the Stencil requester, click Invert, and then click Make Stencil. This will lock the light shades. Select pure black (R=0, G=0, B=0) as the current background color and clear the screen again. You now have a pure black-and-white outline image. Be sure to turn off Stencil when done.

To combine the images, go to the spare screen and load the color posterized image. Go back to the main screen and check the outline image. If the outline color has changed, you should apply Stencil to all colors except the outline color. Select black (or white as desired) from the palette and draw a solid rectangle over the entire screen. This will paint the outlines and

not affect any other color on the screen. Again, turn off Stencil.

If the background has changed to some other color, it's okay. Simply make white, or whatever color it changed to, your current background color by clicking the right mouse button on it as before. While still looking at the outline image screen, go to the Picture menu and select the Spare/Merge In Back submenu. The color image on the spare screen will merge in place of the background color, leaving the outlines over the image. Now you have the completed graphic.

BUT DPAINT DOES IT, TOO!

As you can see, compositing with DeluxePaint is easy. Earlier we converted and posterized the image with DeluxePaint, but that's not all the program can do. Although we've used several relatively complex image-processing programs to perform edge detection or outlining, DeluxePaint III, IV, or AGA will give you the same outline effects. Here's how.

Once the image has been posterized with DeluxePaint, carefully choose a few colors in the image that cover areas you want outlined (five to eight colors will do nicely). Now Stencil all colors except one of your chosen colors and pick up the whole screen as a rectangular brush. Turn off the Stencil, select black or white as the current brush color, and press the o key twice. This puts a two-pixel-wide outline around the brush image. Now stamp the outlined brush exactly back where it came from. If you do this for each of your chosen colors, you will have a complete posterized, outlined graphic without having to do gray-scaling or compositing. The only drawback to this method is that picking up a whole screen as a brush eats up a lot of chip RAM.

One important caveat here for video buffs: Never use this technique for video if you have outlines one-pixel thick. The image will flicker like crazy on a composite monitor and look extremely unprofessional. Take time to thicken the outlines before (or after) merging them with the color image. Using DeluxePaint, either pick up the lines as a brush without background or use Stencil to exclude the other tools. Use the o key or stamp the outlines back down shifted one pixel vertically, horizontally, or both.

Following the steps outlined here (no pun intended), you can produce this technique both with a variety of trusty old standbys or with some less familiar but high-powered new image-processing programs. The only real expertise required lies in selecting a good image to work with. The rest is simply taking advantage of the wonderful graphics software available for the Amiga. And we haven't used up all the magic by any means. There are many more interesting, striking effects you can try with these programs. It just requires experimentation. I hope this article has given you the courage to delve deeper into the graphics magic of the Amiga. ■

Fred Hurteau spent 12 years as a commercial artist prior to opening an Amiga-based video and graphics studio where he produces corporate, educational, and commercial materials, including training videos for Amiga products and techniques. He teaches Amiga graphics and animation classes at Pembroke State University in North Carolina.

The *AW* Amiga Fonts
**BUYER'S
GUIDE**

PART 1



DTP FONTS

WHILE THE AMIGA is recognized as the leading video/multimedia platform in the desktop field, its capabilities for producing text and graphics for high-quality printed documents are much less well known. Although it still does not enjoy the reputation of the Mac and MS-DOS platforms, the Amiga has recently been making significant headway as a serious desktop-publishing (DTP) tool.

Some of this new-found publishing strength stems from improved font-handling routines in the new releases (2.0, 2.1, and 3.0) of AmigaDOS, as well as from improvements and new additions to the stable of Amiga DTP software. But a lion's share of the credit must go to the tremendous growth in the number of high-quality fonts now available for use with the Amiga.

One of the essential components in a finished document is the quality of the typesetting. Printed text is much less forgiving than video titling, requiring much higher resolution, better quality letterform design, more graceful letter and word spacing, and careful design and placement of the text and graphic elements on the page. In the early days, the Amiga was equipped with only fairly coarse bitmapped fonts, which were not suitable for quality typesetting. Things have changed dramatically, however, and today's Amiga users enjoy a wide range of options for creating professional-quality typeset documents.

In Part 1 of our buyer's guide, we will focus on so-called "structured" (or "outline") fonts, which have

been specifically designed to give smooth, jaggie-free output. Bitmapped fonts, so useful for video production, will be covered next month in Part 2.

A WORD ABOUT STANDARDS

Someone once said, "The nice thing about standards is that there are so many to choose from!" Whether you're using an Amiga, a Mac, or an MS-DOS-compatible computer, one thing that becomes clear very quickly is that there are a lot of nonstandard "standards" among outline fonts. All outline fonts are similar in that they consist of letter shapes made from mathematically defined lines and curves, but different developers have attempted to establish competing, proprietary (and often incompatible) formats. All of these outline fonts, however, are a bit like electronic rubber: The basic letter form can be stretched to a variety of sizes and still print out smoothly, and depending on the program with which it is used, structured text can be rotated, squeezed, twisted, and manipulated in a wide variety of ways.

There are two main kinds of outline fonts, originally developed for MS-DOS and Mac systems and now available on the Amiga. These are Agfa Compugraphic Intellifonts and Adobe Type 1 PostScript fonts. In addition, three very good and very popular Amiga programs, Final Copy (Softwood), Saxon Publisher (Saxon Industries), and PageStream (Soft-Logik), each offer their own proprietary structured-font formats. There are a number of other structured font formats ▶

BY JEFF EVANS

available on other computer platforms (including Type 3 PostScript, Bitstream, and TrueType). While some of these can be converted into an Amiga-usable form (see "The ABCs of Amiga Fonts," p. 51, in last month's issue), they are not used all that often on the Amiga. For now, we'll concentrate on the two major and three minor structured-font formats with which virtually all serious Amiga DTP is currently being done.

What follows in the remainder of this article is designed to help you in two ways: The rest of the main text will explain the different approaches taken by each of the developers of the various structured-font formats—with an eye towards showing you what each has to offer (or not offer) for your type and printing needs. The "Mini-Buyer's Guide" sidebar will present specific type collections available in these formats—plus several font-conversion utilities you may find useful.

GOLD DISK STRIKES FIRST: COMPUGRAPHIC INTELLIFONTS

Until now, most Amiga DTP fonts have been created on other computer platforms and then converted into an Amiga-usable format. When *Gold Disk* introduced the **Professional Page** (current version 4.0, \$295) DTP program in 1987, Pro Page used only bitmapped screen fonts and metric tables that it had licensed from Adobe, the creator of the PostScript page-description language. Without actual Amiga-format versions of the fonts, Pro Page users were limited to creating a rough approximation of the text on their Amiga monitor screens, and then getting a printout by sending instructions from the Amiga to the output device (a PostScript-compatible laser printer or Linotron typesetting machine). The actual structured Adobe fonts were resident on the printer, not the Amiga.

This was okay if you were satisfied with the 35 PostScript fonts that were installed on ROM chips on most

PostScript laser printers. If you wanted to use any other fonts, however, you had to buy them in Mac- or MS-DOS-disk format, download them from a Mac or an MS-DOS computer to the printer's memory, and then print your Amiga document—in effect, requiring you to have a second computer hooked up to the printer.

Gold Disk got around this problem in late 1988 by licensing Agfa Compugraphic's "Intellifont" technology, which offered any number of advantages. First, because the fonts were actually converted to Amiga-disk format, they could be loaded onto the Amiga and then downloaded to the printer along with the document. That meant you no longer needed a Mac or an MS-DOS computer (or bridgeboard). Also, rather than using an inaccurate, coarse bitmapped version of the font, Intellifont fonts actually "printed" the letterform to the Amiga monitor screen, as well as to the printer, giving you a much more accurate WYSIWYG (What You See Is What You Get) display, than the older style Adobe screen fonts.

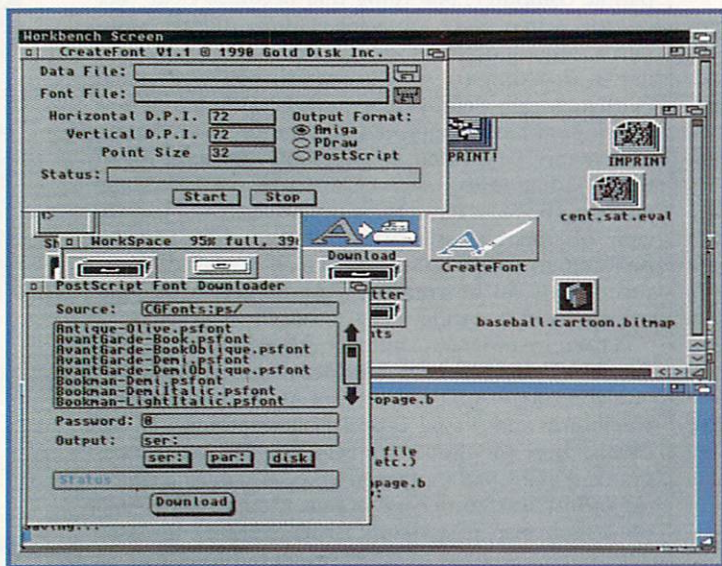
In addition, Gold Disk developed a font-conversion utility that allowed users of Amiga Intellifont fonts to convert the basic typesetting fonts into **Professional Draw** (current version 3.0, \$199.95) format (to allow users to do such sophisticated text effects as bending and warping), as well as to convert the structured fonts into Amiga bitmapped format for use in video or paint programs. Not only that, the Intellifont structured fonts could also be output to dot-matrix or inkjet printers to the maximum resolution of those devices. This meant that cheap non-PostScript printers could be used for proofing, or even for final output if quality requirements were modest.

One limitation of the original Gold Disk Intellifont offering was the limited number of fonts in Amiga format. Gold Disk has continued to license additional fonts, so that it now provides a reasonably good basic assortment of more than 180 fonts; the company states that it will add additional typefaces to its library "as demand warrants."

Commodore picked up on the benefits of the Compugraphic Intellifont technology and included it as a part of the AmigaDOS 2.0 operating system. Most 2.0-compatible programs, such as the current version of Electronic Arts' *DeluxePaint*, support bitmapped versions of Intellifonts. With 2.0's *Fountain* program, you can make bitmapped versions of any Compugraphic font—in user-selectable sizes. AmigaDOS supports PostScript output directly through the *PrinterPS* program in AmigaDOS 2.1 and above. *PrinterPS* offers a fairly wide range of output options, although there have been some incompatibility problems, especially with older Amiga programs, as well as bugs with the *PrinterPS* program itself. (For more on the new font-handling improvements to release 2 of AmigaDOS, see Parts 4 and 5 of the series "Digging in to DOS," Feb. '93, p. 55, and Mar. '93, p. 65, respectively.)

SOFT-LOGIK: POSTSCRIPT ... AND A WHOLE LOT MORE

Soft-Logik, the publishers of **PageStream** (current version 2.2, \$299.95), initially had some problems with the bugginess of early Amiga versions of its software. This limited PageStream's acceptance among professional Amiga desktop publishers for a while, in spite of its extensive list of high-end typesetting features. However,



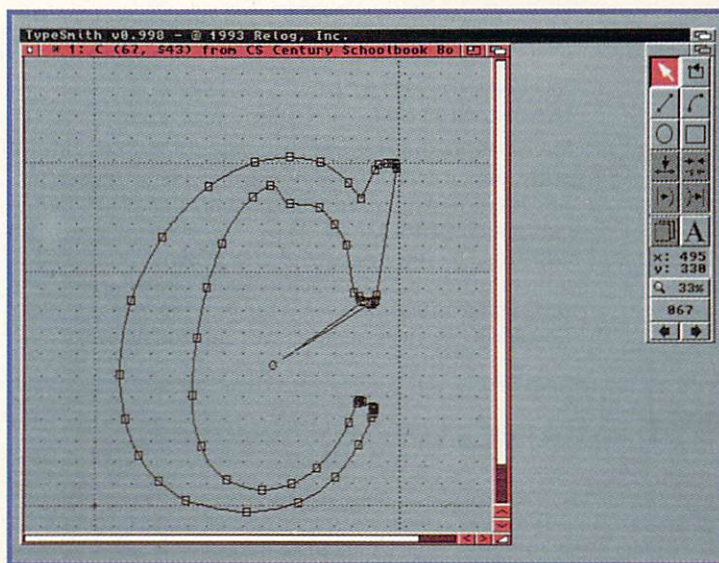
Gold Disk's Pro Page allows users to take dozens of Compugraphic Intellifont faces and convert them to Pro Draw, downloadable PostScript, or Amiga Bitmap formats.

in the course of making PageStream more robust, Soft-Logik also included even more extensive font options than are to be found in Gold Disk's Professional Page program.

Currently, PageStream offers its own proprietary structured-font format, plus compatibility with Adobe Type 1 and Type 3 PostScript fonts, as well as with Compugraphic fonts. In addition, Soft-Logik provides a vast assortment of PostScript fonts in Amiga-disk format. In terms of font selection and typographic control options, PageStream is unquestionably the leading Amiga DTP program, and it compares quite favorably with publishing software on other platforms.

Recently, Soft-Logik released **Art Expression** (\$249), a direct competitor to Gold Disk's Professional Draw structured-illustration and text-manipulation program. It is compatible with Type 1 PostScript fonts (MS-DOS format only), which means that thousands of fonts are available for use with it. (For a complete review of Art Expression, see Apr. '93, p. 28.)

Even more recently, Soft-Logik has done a great favor to the Amiga desktop-publishing community by announcing the imminent release of the first full-featured professional Amiga outline-font editor. **TypeSmith** (\$199.95) will allow users to create outline



Soft-Logik's forthcoming TypeSmith program allows users to create new outline fonts from scratch or [as pictured above] to modify existing ones.

Mini-Buyer's Guide to Amiga

DTP FONTS AND FONT UTILITIES

WHILE THE FOLLOWING is not a complete list of what's available in the way of structured fonts and font utilities for Amiga DTP, it does include most of the more commonly available commercial products. In addition to the fonts already available in Amiga-disk format, the font-conversion utilities listed at the end of the guide will enable you to convert many of the more than 27,000 PostScript fonts available on Mac and MS-DOS platforms into Amiga format.

FONT COLLECTIONS

Gold Disk Type CG Outline Fonts

Gold Disk

Gold Disk supplies several font libraries in Agfa Compugraphic Intellifont format. As well as the approximately 60 fonts that are available in these sets from your Amiga dealer, Gold Disk sells directly several dozen other typefaces "on request." Using the included CreateFont utility, you can take the basic Intellifont format and convert it to Professional Draw, downloadable PostScript, and Amiga Bitmap formats.

The Agfa fonts install easily and provide

very accurate and detailed screen displays, generally good dot-matrix printer output, and excellent high-resolution PostScript output. The Intellifont format is also supported directly by AmigaDOS 2.0 and higher. The only drawback to the Intellifont format is that it isn't the industry "standard"

for outline fonts (effectively, Adobe Type 1 is the closest thing to a standard there is). There are only a couple of hundred fonts available in Agfa format, and while the offerings are of excellent technical quality and cover the most commonly used typefaces, the selection is not increasing rapidly. ►

TYPE:
CG Century Schoolbook
CG: Futura Bold
CG TIMES ROMAN

Examples of some standard Agfa Compugraphic Intellifonts from Gold Disk, developer of Pro Page DTP software.

fonts from scratch or modify existing ones. (See the "Mini-Buyer's Guide" for more on TypeSmith.)

SAXON AND SOFTWOOD: STRONG SUPPORTING ROLES

Saxon Publisher (current version 1.2, \$299), an unfairly obscure DTP program from *Saxon Industries*, has its own structured-font format, as well as being compatible with Adobe Type 1 PostScript fonts. In addition, Saxon Industries has recently released a unique program, *SaxonScript Professional*, which is a powerful PostScript interpreter that lets you use non-PostScript devices such as dot-matrix printers and

non-PostScript laser printers as though they were full-fledged PostScript printers. The company also claims that the program supports a wide range of PostScript fonts, and offers a sizable array of font-conversion options. (See the "Mini-Buyer's Guide" for more on *SaxonScript*.)

SoftWood's Final Copy II (\$99.95) word-processing software provides the last and perhaps the most independent-minded of all the font offerings described here. *Final Copy II* has its own structured-font format, with *Softwood* including a decent range of fonts with the program, as well as selling additional packages of fonts on request. One of the principal advantages of

Mini-Buyer's Guide (continued)

It would have been better for Amiga DTP users if Gold Disk (and Commodore) had settled on Adobe Type 1 fonts as the standard, but for various historical reasons, this opportunity was passed up in 1985, when, unlike Apple, Commodore declined to invest in Adobe technology.

One serious weakness of Gold Disk's handling of the whole font issue is that its Font Manager conversion utility (which is provided as part of Professional Page 4.0, Page-Setter 3, and Professional Draw 3.0, and is supposed to be able to convert Adobe Type 1 fonts into formats usable in the various Gold Disk DTP programs) simply doesn't work very well—either simply refusing to work or hanging up and "Zzzz-ing" indef-

initely. It failed to convert most Adobe Type 1 fonts that I tried it with. Gold Disk tech support simply suggested that the fonts I was trying to convert "weren't standard Type 1 format." These same fonts, however, all worked fine with PageStream.

Prices for Gold Disk font packages range from \$36 for a single family, to \$60 for a set of three decorative display fonts, to \$199 for a set of the basic 35 fonts commonly found on PostScript laser printers.

Newsletter Font Pack
Starter Font Pack
Classic Font Pack
Designer Font Pack

Soft-Logik

Through an arrangement with Image Club, a major vendor of PostScript fonts, *Soft-Logik* sells a vast assortment of good quality PostScript fonts (more than 200 currently listed) and structured clip-art in Amiga-disk format. These fonts work very well with the company's PageStream and Art Expression programs. They can also be imported into *Soft-Logik's* new TypeSmith font editing/design program for specialized modification. In addition, they can be converted into Pro Page or Pro Draw formats using *Mirror Image's* MIFont and MIOutline utilities, respectively (see "Font Utilities" below).

Prices for the *Soft-Logik* Library collections are: Starter Fonts and Newsletter Fonts, \$99.95 each (eight fonts per set); Classic Fonts and Designer Fonts, \$199.95 each (16 fonts per set).

ProStream Plus
Western Fonts
Fancy Fonts
Condensed Fonts
Allied Studios

The ProStream Plus collection of 70 Type 1 PostScript fonts is the class act of third-party DTP font offerings for the Amiga. A labor of love, these fonts show obvious evidence of great care and hard work in every aspect. They were also a breeze to install (ProStream Plus was the only piece of software reviewed for this article that was entirely idiot-proof—an extremely important feature for any software this reviewer has to learn) and the fonts worked perfectly. The package includes two separate versions of all fonts: one for Professional Page and one for PageStream. This overcomes the usual problem of ProPage's notorious finickiness about non-Intellifont typefaces.

Numbered among the 70 fonts included are some of the best of the public-domain/shareware display typefaces available,

PS1: Nuevarese Bold Italic

PS1: POSTCRYPT

PS SHOWBOAT

1: PARIS METRO

PS1: Sparkle Swash

A wide variety of Adobe Type 1 PostScript fonts are now available to Amiga desktop publishers. [From Allied Studios' Pro Stream Plus collection.]

Final Copy II's font system is that it seems very fast, especially on Amigas with slower processors. For a word processor, Final Copy II has very powerful page-layout and graphics-handling features, and fairly comprehensive PostScript output capabilities. For many users whose needs fall short of high-end commercial typesetting requirements, Final Copy II offers all the DTP power you will likely need. (For a complete review of Final Copy II, see Feb. '93, p.74.)

The rapid progress in the development of Amiga fonts has meant that Amiga DTP users now enjoy font options comparable to those available on any other

computer platform. Ranging from the sophistication of PageStream and Professional Page (and their associated illustration programs) to the simplicity, speed, and economy of Final Copy II, there is a comprehensive array of fonts and page-make-up tools that can handle the full range of professional typesetting and illustration needs. ■

*Jeff Evans co-founded Canada's first microcomputer-based typesetting company in 1984, and has used the Amiga for animation and design since 1985. He teaches in Toronto, edits **Liquid Image Multimedia** magazine, and is a writer for TV Ontario's **Prisoners of Gravity** sci-fi series.*

and publisher Lion Kuntz includes acknowledgements of the creators of each of the faces. Kuntz, one of the pioneer Amiga type designers, did some of the first decent Amiga bitmapped fonts back around 1986-1987, and he continues to render a great service to Amiga users. While the program's excellent install routine is installing your fonts for you, you can sit back and peruse the included ReadMe file in which Kuntz makes some very pertinent editorial comments on current issues and problems relating to Amiga font technology and DTP generally.

With a retail price of \$70, ProStream Plus is a definite bargain.

Kuntz also publishes Western Fonts, Fancy Fonts, and Condensed Fonts—PostScript packages containing 16, 14, and 19 fonts, respectively. The Condensed set was not available for review at the time of this writing, but should be shipping by publication time. Western and Fancy Fonts (\$30 each) both feature attractive display fonts that are fun to use. If you need high-quality decorative faces at a low cost, these packages are a good choice.

Kuntz will also convert any of the 27,000 available PostScript and TrueType fonts into Amiga format on an "as requested" custom basis, and, if you wish, he will also add custom logos to your fonts for a fee.

Fontmania

80 Track Software

distributed by InSync Digital Corp.

The largest collection of Amiga Adobe Type 1 fonts (300 in all), Fontmania is a vast 15-disk set of public-domain offerings. The fonts are not as easy to install on Professional Page as Allied Studios' ProStream are, but they do install quite nicely on PageStream and Saxon Publisher. At \$84.95, Fontmania represents an excellent value and should also silence anyone who still claims that "there aren't any PostScript fonts for the Amiga."

PageStream Fonts

Dennis Palumbo

Type designer Dennis Palumbo has created an excellent series of high-quality outline fonts compatible with PageStream's proprietary font format. (Please note that only Disks 1 and 2 of this five-disk set were evaluated for this article.) They installed easily and worked perfectly. The fonts provided excellent dot-matrix, as well as PostScript, output.

With the release of Disk 5, Palumbo intends to convert all the fonts to Adobe Type 1 format, which would make them easily convertible—via utilities such as MIFont and MIOOutline—to Pro Page and Pro Draw formats, respectively.

Priced at \$34.95 each, all disks come with three fonts, and there is a discount of 30% if you purchase the complete five-disk set.

FONT UTILITIES

MIFont

MIOOutline

Mirror Image Productions

MIFont and MIOOutline comprise a set of excellent utilities for converting PostScript fonts into formats usable with Professional Page and Professional Draw, respectively. Unlike Gold Disk's Font Manager, which is supposed to do the same thing, these utilities are robust and reliable.

I found the MIOOutline program indispensable for adding to my library of available fonts for Pro Draw. Installing and using both programs are easy, and each performed exactly as billed. Prices: MIFont—\$105; MIOOutline—\$125.

SaxonScript Professional

Saxon Industries

Released just recently, this utility should prove very valuable as a handy PostScript interpreter and conversion program (although the early version that I used was somewhat difficult to install). Supporting virtually every imaginable file format and output device, SaxonScript Professional (\$130) may become an essential tool for the serious Amiga desktop publisher.

For instance, Saxon Industries reports that the program supports all PostScript downloadable fonts (outline fonts that you can download from the Amiga into the printer's RAM) that are compatible with PageStream, Pro Page, or Saxon Publisher. The program also converts outline fonts into Amiga bitmapped, Saxon Publisher, and Adobe Type 1 PostScript formats, and "prints" PostScript files to the Amiga screen for a "soft" preview.

TypeSmith

Soft-Logik

TypeSmith is a full-featured outline-font editing/design program—the first of its kind on the Amiga. It is intended to let users create new PostScript, Compugraphic, or Soft-Logik outline fonts from scratch, or to edit existing fonts in these formats. Structured objects from Soft-Logik's Art Expression can also be imported to be used as characters.

Prior to the release of TypeSmith, an Amiga designer's only option was to auto-trace a scanned bitmap of a letter or logo, or to use the font editor in Dyna-CADD, a 3-D CAD program from Ditek Int'l with some good text-handling features. If the program lives up to its advance billing, it could fill a very annoying gap in the line-up of Amiga DTP programs, and stimulate a wave of Amiga-based font creation. □

—JE

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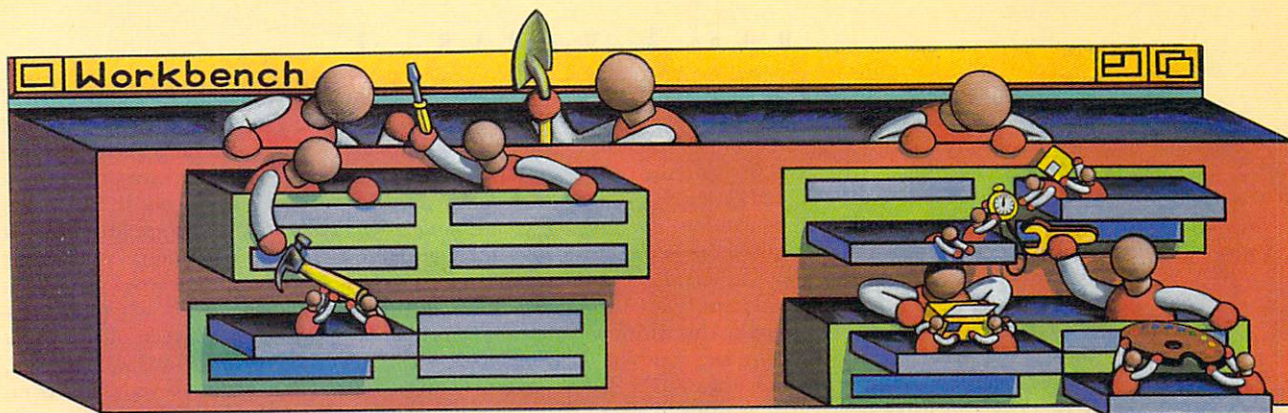
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C= Commodore
AMIGA



Digging in to DOS

A SERIES THAT EXPLORES THE AMIGA'S RELEASE 2 OPERATING SYSTEM

*Our series' final installment
explains why AmigaDOS 2's
Commodities programs have nothing
to do with wheat futures, but lots to
do with easy customization of
your system.*

Before Workbench 2.0 came along, Amiga owners used a hodge-podge of utility programs to perform specialized functions involving the mouse and keyboard. Different utilities would activate a window as the mouse pointer passed over it, assign text strings to function keys, or launch programs with a series of keystrokes. The problem was that these background programs would often interfere with applications such as word processors that relied on the function keys for their own purposes. Moreover, there was no guarantee that two such programs wouldn't both require the Alt-F1 key combination, for instance, for different purposes.

Workbench 2.0 addresses this problem, providing an officially sanctioned method for creating utility programs that manipulate mouse and keyboard input. This new facility makes it easier to create such programs and minimizes the risk that they will interfere either with applications programs or with each other. The system software at the heart of this scheme

is the Commodities library, and programs that make use of it are called commodities. The standard commodities that Commodore supplies are found in the Commodities drawer in the Tools directory of your Workbench partition (if you have a hard drive), or of the Extras floppy disk.

SHARED VALUES

While Commodities programs perform a wide range of functions, they have certain features in common. Each commodity is assigned a priority that determines which gets first crack at the input information. This priority value usually defaults to zero, but you can change it by editing the ToolTypes in the commodity's icon. You do this by clicking once on the icon, and selecting Information from the Icons menu on the Workbench. This brings up a window in which you can edit the lines of text in the ToolTypes list. The relevant line reads CX_PRIORITY=x, where x is the priority number. ►

BY SHELDON LEEMON

Another feature many commodities share is a control window from which you can alter the programs' settings. The CX_POPUP ToolType determines whether or not this window appears when you first run the program. If the ToolType reads CX_POPUP=NO, the program will run without opening its window. Even if the window does not open automatically, however, each commodity with a settings window also has a corresponding key combination, designated in its CX_POPKEY ToolType, that can be used to make this window appear. Because the descriptions of the key combinations are relatively straightforward (the phrase "CTRL ALT B" describes the three keys you must press to bring up the Blanker screen, for example), you can easily change them, or just read them from the Information window if you forget what they are.

You can also bring up a Commodities Settings window by using the Exchange program. This program, also located in the Commodities drawer, acts as a control center for all of your Commodities programs. When you run Exchange, it displays a list of all of the commodities that are currently running. Its gadgets allow you to show or hide the settings window for a particular program, deactivate or reactivate the program, or remove the program from the list by sending it a message to quit.

CHOICE PICKS

Several standard Commodities programs come with Workbench versions 2.0 and higher. One of the simplest is AutoPoint, a program that activates any window over which the mouse pointer passes. This program does not have a control window—you just double-click on its icon to start it and double-click again to turn it off.

The NoCapsLock program works much the same way, but serves to disable the Caps Lock key. You can still use the Shift keys, but with NoCapsLock running, accidentally pressing the Caps Lock key won't suddenly shift you to ALL CAPITAL LETTERS.

Screen blankers are programs that put up a blank screen if you don't use the mouse or keyboard for a certain period of time. They save wear and tear on your

monitor. Commodore's Commodities version is called Blanker, and in its simplest form, it pops up a control window into which you enter the number of seconds of inactivity that you want to elapse before the screen turns black. The 2.1 version adds a couple of options to create screen activity so that you won't forget about the blanker and think that your computer has suddenly gone dead. The Cycle Colors option causes the screen color to cycle through various shades, while the Animation option creates a moving pattern of lines that whirl around the screen. If both options are selected, the lines change color as they move. As with most commodities, the options are saved in the program icon, using the ToolTypes CYCLECOLORS=YES (or NO), ANIMATION=YES (or NO), and SECONDS=x, where x represents the number of seconds of inactivity before Blanker activates.

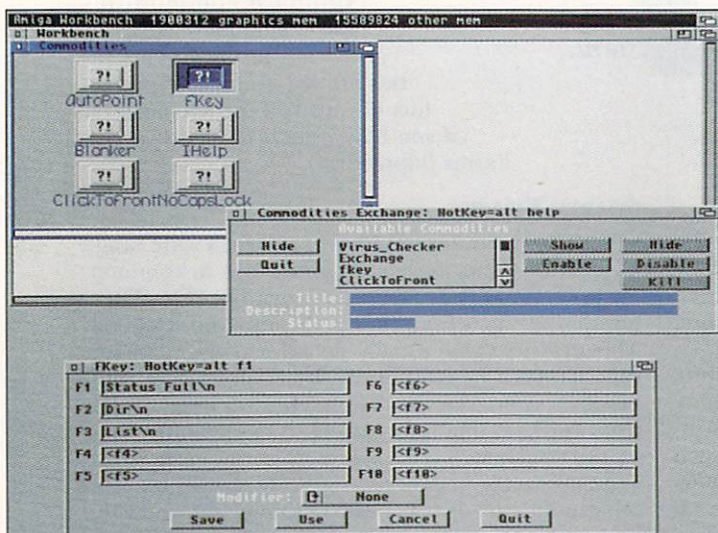
Programs that add more keyboard shortcuts have always been popular, so it is no surprise that a couple of these types of commodities are included. The IHelp (short for Intuition Helper) program lets you use the keyboard to perform a number of window-sizing and -activation functions that normally would require the mouse. By default, the F1 key invokes the Cycle Windows function, which brings the rearmost application window on the Workbench screen to the front and activates it. The F2 key enlarges the active window to its maximum size, while F3 shrinks it to its minimum; F4 cycles through possible sizes, as does clicking the Zoom gadget. The F5 key cycles through screens, bringing the rear screen to the front, as does the Left-Amiga-M combination. You can change any of these defaults by editing the ToolTypes in the program's icon. These default to CYCLE=F1, MAKEBIG=F2, MAKESMALL=F3, CYCLESCREEN=F4, and ZIPWINDOW=F5.

FUNCTIONALLY LITERATE

The FKey commodity is the program that finally answers the question "What do I do with those function keys, anyway?" FKey allows you to assign text to function keys (F1–F10) and shifted function keys. For example, if you assign "Dir \n" to the F1 key, when you press F1 at a Shell prompt, the function key will type in the Dir command and hit Return (the \n is the new line command that automatically presses the Return key at the end of the line). You can also assign special keystrokes—such as the zero on the numeric keypad—to a function key. This allows you to emulate the numeric pad even on the Amiga 600, which does not have these keys.

The 2.1 version of FKey carries this idea much further. In this version, you can assign functions to virtually any key or combination of keys on the keyboard; such functions are not restricted merely to inserting a string of text characters, either. For example, you can assign any of the IHelp functions (Cycle Windows, Cycle Screens, Enlarge Window, Shrink Window, Toggle Window Size) to any key, thus eliminating the need for a separate IHelp program. Like the popular public-domain program PopCLI, 2.1's FKey also allows you to run a program or ARexx script just by pressing one or more keys.

The ClickToFront program allows you to bring a window to the front of the screen by double-clicking anywhere inside it, which can be very handy if the depth gadget is not visible. By default, you must also press the



Windows on the world of Commodities: the contents of the main directory, the Commodities Exchange window, and the FKey requester.

Left Alt key while double-clicking in order to move the window. You can change this qualifier key, or eliminate it entirely, by changing the QUALIFIER= ToolType. Possible choices include Lalt, Ralt, Control, and None.

With the addition of the CrossDOS file-exchange program to Workbench 2.1 came a new CrossDOS commodity. This program allows you to specify text filtering of files read from an MS-DOS disk, such as changing the carriage-return and line-feed combination used in MS-DOS text files to the simple line feed used in Amiga text files. A translation button also allows you to do character translations, such as eliminating MS-DOS line-drawing characters that do not have Amiga equivalents.

One new commodity made its debut in Workbench 3.0. MouseBlanker makes the mouse pointer invisible whenever you are typing on the keyboard. This eliminates the annoying situation in which the mouse pointer hides what you are typing.

COMMODITIES FUTURES

Although the Commodities scheme makes things easier for both the programmer and the user, it does exact a cost in the form of increased overhead. Having a number of Commodities programs running at the same time means that the system may have to check with each one every time you press a key or click the mouse. While this should not cause a noticeable slowdown under ordinary circumstances, it may if you run lots of commodities on an unaccelerated machine. To prevent this problem, Commodore software engineers

have indicated that they may integrate the functions of some small Commodities programs, such as Click-ToFront, directly into a future Kickstart version.

Even if Commodore reduces the number of standard commodities that it includes with Workbench, however, there will still be an enormous number of public-domain and shareware Commodities programs. These include screen blankers, clocks, print spoolers, window manipulators, text cut-and-paste utilities, and programs that add items to the Workbench Tools menu. If the idea of performing complex tasks with a single keystroke appeals to you, you'll find it worthwhile to track down some of these programs. ■

Sheldon Leemon is a frequent contributor to AmigaWorld and writes for several other computer publications. He also wrote the fourth edition of the AmigaDOS Reference Guide (COMPUTE Books), a guide to using the CLI under operating-system releases 2 and 3. When he's not writing, you can often find him at Slipped Disk, a Detroit-area Amiga dealership.

This article concludes our seven-part look at using the new features of Workbench 2.0. Would you like to see another series devoted to using system software in a more general way? Please let us know. Also let us know what topics you'd like to see covered. Write to "DOS Column," AmigaWorld Editorial, 80 Elm St., Peterborough, NH 03458.

AMIGA

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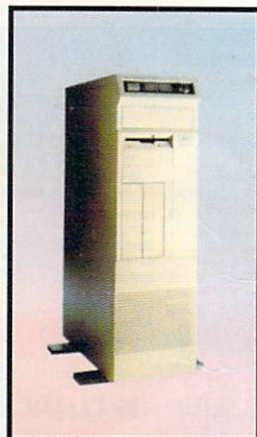
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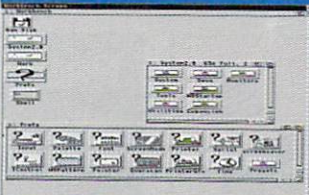
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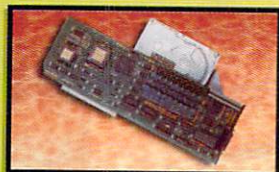
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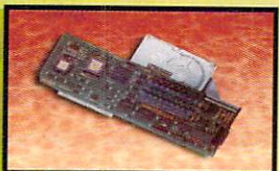
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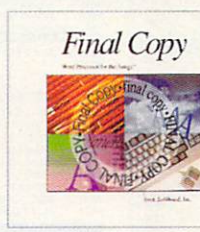


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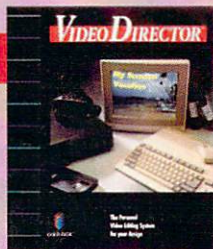
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Fun & Games With DTP

51

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

By Joel Hagen

MANY AMIGA ARTISTS have never really explored the world of desktop publishing. I have fallen completely in love with it, although I confess I use it primarily for gags, fun, and hoaxes. (A few of my "SAND FIRE WARNING" signs can still be seen on bulletin boards in Death Valley.) If you are new to DTP, perhaps this column will give you an overview of some fun ways you can get involved.

Desktop-publishing software lets you create professional-looking page layouts on your home computer. You can combine text, images, and other graphic elements with powerful control over size, composition, type style, and so forth. You can then print your page at any resolution your printer supports. This means that you can bypass the layout services of a print shop and produce high-quality ads, newsletters, reports, and so on at your computer. If you own a laser printer, you can print fairly nice versions of these at 300 dpi. A service bureau, of course, can print them at much higher resolutions for truly professional results.

Most desktop-publishing programs share similar features. The accompanying illustration shows the interface of Soft-Logik's PageStream 2.21. That particular version has been attractively updated and streamlined. It is smooth to work with and easy to learn. The illustration shows a magnified area of the page; the tools on the right and menu bar above contain a multitude of convenient features you can utilize to create and modify clean page layouts. Shown here are two examples of mixed text and graphics such as you might use in a letterhead or business logo.

PageStream, Professional Page (Gold Disk), and other DTP programs come with several basic fonts included. More exotic display fonts such as the ones shown here are available from other sources and can be great fun to play with. Fonts are available in public-domain collections, online via modem downloads, and in commercial packages. One particularly good source of display fonts is Allied Studios (see p. 92

for address and phone number), which supplies bundles of fonts for both PageStream and Pro Page at reasonable prices. The variety should be enough to keep any font-hungry desktop designer satisfied for some time. (Editor's Note: *AW* is presenting a comprehensive, two-part Buyer's Guide to Amiga Fonts, beginning with DTP fonts in this issue, p. 43.)

If you use a lot of these complex display fonts, however, you may find that your printer refuses to process the page. This can usually be remedied. In PageStream, for example, you can bring up the Configure Printer requester from the Global menu. Enter "auto-unload" under Special and select the Save Default button. Each font will be dumped from the printer memory when a new font loads.

"ZING WENT THE STRINGS OF MY ART . . ."

Typefaces are not always letters of the alphabet. Fonts such as Zingers, Dingbats, Ornaments, and other special sets have ornate pictures, symbols, and border designs in place of letters. The Viking ship in the illustration, for example, is typed to the screen when you press the u key in one of Allied's Zinger fonts. Having a selection of these clean little graphic spots available as fonts is often handier than sorting through disks of clip art.

The sun image in the Planet Productions logo was created using techniques discussed at greater length in Accent #43 (see Sept. '92, p. 44). The sun was drawn in DeluxePaint's (Electronic Arts) high-resolution mode, then converted to a scalable PostScript object using the Trace program included with Gold Disk's Professional Draw. This gives an interesting "woodcut" character to the printed image that is difficult

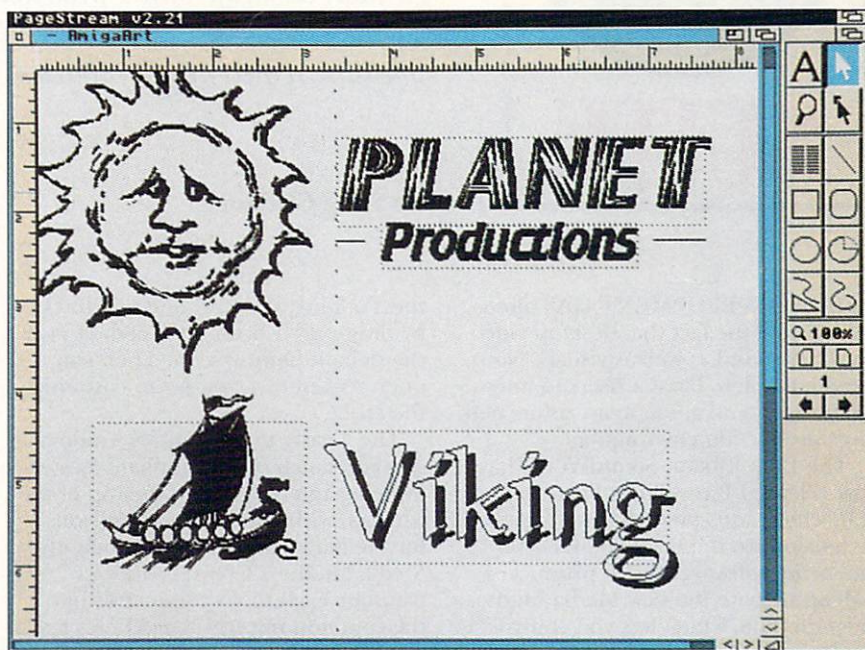
Whether for serious business purposes or just for a little light-hearted diversion, specialized desktop-publishing projects can be a lot of fun.

to achieve with standard drawing software. The ability to convert painted or scanned line art into clean, high-resolution printed graphics is a powerful feature of desktop-publishing operations that can become addictive to any computer artist.

There are also many materials available now to DTP artists that expand the options at the printout stage. Paper companies are paying attention to the growing phenomenon of desktop publishing and are producing preprinted and die-cut stock suitable for laser printers. You can even buy packs of paper printed with marble texture, color gradients, headlines, and a variety of colorful designs ready to run through your laser printer or copier. You can buy laser-ready adhesive backed labels in a variety of sizes and shapes. Also available at paper supply outlets are die-cut laser sheets of Rolodex cards, doorknob hanger signs, badge making kits, and other specialty items.

An even more unique option you might want to try is the hot-foil effect. Allied Studios and other sources sell packs of a special foil designed to be used with laser printers and most copiers. A piece of the special foil can be fastened to a laser printout and run through the machine a second time. The heat and pressure of the rollers causes the foil to adhere only to the printed areas. The unused foil is simply peeled off. You have to see this effect to believe it. My favorite variation is the hologram diffraction foil. For either business or fine-art experiments, this is an amazing trick. Be aware, however, that while using foil is a proven technology, it is not what laser printers were intended to do—so be cautious.

If you put your imagination to work, there really are no limits to the kinds of fun projects possible with an Amiga, DTP software, and a laser printer (even



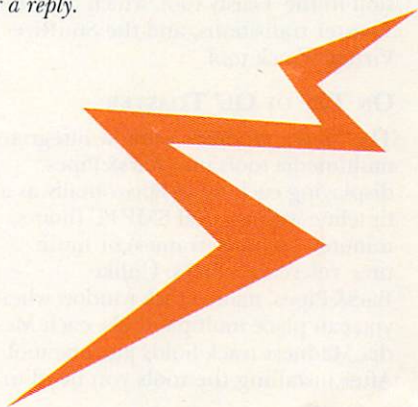
This screen from PageStream shows a magnified area of a page layout. Display fonts and the Viking ship are from Allied Studios collections. The sun image was painted in DPaint and then converted to a scalable object with Pro Draw's Trace program.

dot-matrix results looks pretty good.) Anything you do looks official. You can crank out fortune-cookie messages, signs for your kid's door, personalized jam and pickle labels, KGB letterheads, bumper stickers, Foreign Legion draft notifications . . . the mind boggles. Every now and then I attend a conference where I want to have a business card containing information relevant to that particular situation. In an hour on my Amiga I can whip out a few sheets of unique cards or letterheads for the occasion. Tricks like the hot-foil effect are perfect for these limited special runs.

Back in the gag department, you could try using the ideas mentioned here to print fake can labels of Klingon Chile (or whatever) and glue them over real cans from the supermarket. I have spent some fine afternoons hanging around the generic-food aisle watching people's reaction to a stack of corn cans I bought, relabeled, and then

slipped back onto the shelf. The ultimate satisfaction is hearing a checker's voice over the loudspeaker asking, "Price check on Anteater Surprise?" ■

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 Sound Simply

At last, desktop-video production embraces audio—without requiring acrobatics.

By Steve Gillmor

AMIGA DEVELOPMENT HAS often overlooked the fact that desktop video includes sound as well as visuals. Now, new tools allow Toaster users to integrate video and audio in an automated post-production environment.

The Blue Ribbon SoundWorks has just released Bars&Pipes Professional 2.0, which adds powerful multimedia extensions to the original MIDI-sequencing software. Video producers will appreciate the new Media Madness module, which lets you control multimedia devices on unlimited, simultaneous tracks alongside the music. Add Blue Ribbon's One-Stop Music Shop 16-bit E-Mu sampler-on-a-card (\$649) and SunRize Industries' Studio 16/AD516 stereo digital-audio system (\$1495) and you have all the elements under Bars & Pipes' timeline control.

Media Madness supports many devices and formats directly (see "A Show of Strength," Apr. '93, p. 30, for details), and its Command Performance tool can control others via ARexx and the serial port. We'll limit this discussion to the Toasty tool, which controls Toaster transitions, and the SunRize Virtual Track tool.

ON TOP OF OL' TOASTER

The Media Madness window integrates multimedia tools into Bars&Pipes, displaying each track horizontally as a timeline with vertical SMPTE (hours, minutes, seconds, frames) or music time reference marks. Unlike Bars&Pipes' main Track window where you can place multiple tools, each Media Madness track holds just one tool. After installing the tools you need in

the Toolbox, you add one to a track by dragging it from the Toolbox over the default Output icon. Then you open its Control window to customize the tool.

The Toasty tool's Control window displays much of the familiar Toaster Switcher interface along the top of the window, with names replacing icons for the banks of Switcher commands. Media Madness Control windows translate each tool's commands into the common musical Bars&Pipes language by assigning each event to a specific MIDI note. The Hit List Translation mechanism gives a textual description to each note; in the Toasty tool's case, C5 becomes Shatter or Sheep, C#5 is Smooth Fade or Tear Page, and so on. Each note can have up to six Toaster commands, so you can bunch related commands to set up your Program and Preview video inputs, for example, or choose a transition and activate it with the Auto command. It's a good idea to assign multiple transition sequences to individual notes in the Control window, and then save each group of effects in a catalogue by copying the Toasty icon to one of eight Tooltrays. This way, you can skip the setup next time, and simply drag a prepared Toasty icon from a Tooltray to a new track.

You can test your transitions while in the Control window via the Test button. When you are satisfied, close the Control window and click on the Pencil icon in the Media Madness window. Now, simply click to add events on the timeline of your Toasty track. You can change to a Hand icon to move existing events, an Eraser icon to remove

them, and so on. All the Bars&Pipes Transport controls are active, so you can move to the main Track window and play the events by clicking on the VCR-like Play, Fast Forward, Rewind, and Stop buttons. More convenient is the Mini-Transport window, which you can summon with the m key. Because you can synchronize Bars&Pipes with external devices via SMPTE time code, you can also start and stop Media Madness tracks externally.

SET FOR SOUND

SunRize's AD516 digital-audio board with companion Studio 16 2.0 software is one source for SMPTE time code. The AD516 is a 16-bit stereo card allowing up to eight channels of simultaneous playback. Its internal SMPTE time-code reader allows it to create extensive Cue Lists of samples to trigger to a videotape. The Studio 16 software lets you record, edit, and play back CD-quality stereo sound.

SunRize and The Blue Ribbon SoundWorks have collaborated to allow complete control of the AD516 from within Bars&Pipes. ARexx commands can also be sent to initiate recording, load and play samples, and set volume and panning levels. We'll use the Media Madness SunRize Virtual Track tool to integrate the AD516, in conjunction with Bars&Pipes' Mix Maestro automated mix-down feature.

Mix Maestro gives you real-time control over volume and stereo-panning levels by recording MIDI-control changes on a track. You can go through each track in your song, setting the various levels and stereo positioning of your instruments to ►

optimum levels; the same holds true for AD516 samples. With the Virtual Track tool, you can add tracks for a lead vocal, voice-over, or multitrack mix down of audio dubbed from videotape—all synchronized with MIDI musical events and Toaster transitions. To illustrate, I'll detail the steps necessary to coordinate an audio/video transition between two sequences—a procedure you might use several times for a typical production.

TEAM EFFORT

Because the Toaster disables multitasking while performing Switcher effects, the rest of your Bars&Pipes performance halts during Toaster transitions. A remedy for this is SunRize's Toaster Handler, which replaces your existing AD516 device driver and allows you to play one or two tracks while performing a Toaster effect. A more powerful approach is to assemble your final video in two passes, first with Toaster visual transitions and then with the audio mix. Better still, you can coordinate two Amigas, which I'll return to later.

For now, let's assume you have a video-editing setup that allows you to record video on one pass and audio on a second. I use Sony Hi8 V decks that I can control using serial commands sent by the Command Performance tool. Blue Ribbon's One-Stop Music Shop not only gives you 16 channels of 16-bit multitimbral stereo sound, but also a MIDI interface for attaching a synthesizer keyboard. This frees up the serial port for triggering the V decks or another Amiga.

A word about SMPTE: There are many ways to record and synchronize consumer, prosumer, and professional VCRs. Some machines have an additional third linear track just for time code. Others allow you to overdub on hi-fi tracks without erasing the original video, while a common low-end solution is to use one channel for time code and the other for a mono mix down. In all cases the outcome is the same: SMPTE time code recorded on a track that triggers Bars&Pipes. I use the Studio 16 expansion module SMPTE Output, which employs your Amiga to generate time code for recording on your VCR audio track. Connect the VCR SMPTE audio output to the AD516 SMPTE-In jack, which passes the time code on to Bars&Pipes via the SMPTE accessory module. Bars&Pipes then performs the song under SMPTE control, in turn triggering MIDI music, Toasty

transitions, and SunRize audio events when the time code reaches the appropriate points on the timeline.

First, preview and lay down the visual transition between your two scenes: a smooth, three-second fade from source A to source B. Next, add a Virtual Track tool, designating the recording start time at the same point the Toasty effect begins. Just as in a regular MIDI track for Bars&Pipes Pro, the Virtual Track tool's track must be in Record mode and the Record button in the Transport Controls must be set for recording to occur. Click the Play or Play From Beginning buttons and record source A's audio for the three seconds, pressing Stop to end recording. Repeat the same tasks with a second Virtual Track to record the source B audio. If you select both L and R buttons on the set-up panel, stereo samples are recorded with the Left sample panned full left and the Right at full right. Set both Virtual Tracks for playback and use Studio 16 editing tools to clean up the samples if needed.

Finally, bring up the Mix Maestro window, which displays level faders equal to the total number of tracks in the performance. Since you can perform a mix down on only one track at a time, you should first set the source B volume to 0 and use the Mix Maestro menu's Snapshot selection to set initial values for the track. Now we'll begin playing back the tracks, first fading down the source A audio where the transition occurs. When you play it back, you will see that the fade has been recorded and is automatically performed each time. Next, fade in source B to complete the audio dissolve. If you like, add a third Virtual Track, and record a digital bounce-down of the mix if you need to save RAM, or just let Mix Maestro replay the mix as you insert the new audio on your VCR's audio track(s).

ON AUTOMATIC

Other Bars&Pipes features let you configure and store sets of tracks to automate this procedure. To demonstrate this, first let's store a Smooth Fade transition on the C5 note in the Toasty track, and add a Branch Out tool on the same track (1) in the main Track window. (Both the Media Madness and Track windows are active at the same time; actions taken in one are mirrored in the other.) The Branch Out tool sends a duplicate of each event that enters it down a connecting pipe to another pipeline, in

this case our first Virtual Track on track 2. Add a Merge tool on track 2 to receive the duplicate events, then double-click on track 2 to enter the editor. Select Control Change from the Show menu, choose Control Change #... in the Display menu and set the requester to Controller 7, use the Pencil to draw a fade-in from zero to full volume, and cut the results to the Clipboard.

Drag a Loop tool from the Toolbox to track 2, placing it after the Merge tool, and open the Loop Control window. Select Paste From Clipboard from the Tool menu to paste the fade-in changes, and choose Trigger from the Performance menu. In the Loop Control window, set the Root note to C5 (same as the Toasty event). Finally, add a Branch Out icon after the Loop tool on track 2, and another Merge tool on your second Virtual Track on track 3. Place a ControlInverter tool after the Merge tool (this turns a 0 volume Control Change into a 127, and so on, with a fade out as the result). Holding the Shift key, click once on each track to select them, then choose Save Group from the Group menu. Now you have your dissolve sequence available at any time: Simply load the grouped tracks, establish the SMPTE time where the transition begins in your Toasty track, and set your Virtual Tracks to play the samples at the appointed time. You can record new samples in this configuration; the volume control changes are in effect only during playback.

If you have a second Amiga, you can install the One-Stop Music Shop and the SunRize AD516 with Bars&Pipes and communicate with your Toaster-equipped machine through the serial ports via a null-modem cable. Run the Toaster Receive utility on the Toaster machine and set the Local/Remote button to Remote in the Toasty tool's Control window. Now you can preview and perform Toaster transitions, SunRize sample sequencing, and One-Stop Music Shop MIDI performances simultaneously, mixing in one pass to tape. You can take advantage of repeatable A/B roll editing to construct your productions with second-generation "work prints," then go back when you've got everything just right and work from your original tapes. ■

Steve Gillmor has produced and directed films, audio recordings, and radio and television programs. He enjoys bringing professional-level technology to his Amiga.

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The Game Preserve

EPIC WING COMMANDER

By Peter Olafson

BREAK OUT THE champagne: We've been waiting for these two flyboys to buzz the Amiga for some time now. The space-combat games *Wing Commander* (an import from the UK's Mindscape International, \$39.95) and *Epic* (Ocean, \$49.95), each in development in Europe for around two years, have finally turned up in US air space.

Both games are solid and engrossing, each in its own very different way. But I have to fess up: Anyone who plays *Wing Commander* on a speedy machine first isn't likely to be bowled over by *Epic* afterward. *Wing Commander* will, quite simply, blow you away.

WING COMMANDER

WC is a superb translation of Chris "Times of Lore" Robert's Origin game for the IBM. You're a fighter pilot newly assigned to the Tiger's Claw—a spaceward version of an aircraft carrier that's about to take on an aggressive race of sentient felines called the Kilrathi. You'll fly a range of fighters, each with its own gifts of destruction, cockpit layout, and lovely array of options (two types of missiles and guns, afterburners, ejector seat—the works). You can issue an array of taunts to the enemy ("Die, furball!") and commands to your wingmen ("Break and attack")—actually, there are a number of wingwomen as well—who'll respond on a green-screen monitor. Once you've fried the last of the "kitties" or cleared a belt of obstacles, you



It's you against the Kilrathi in *Wing Commander*.

can kick in the autopilot to jump to your next encounter with a neat side-view cut scene.

Obstacles? You'll play intergalactic dodgeball and 3-D asteroids with the Kilrathi proximity mines and asteroid fields. And watch out for swarms of enemy craft, ranging from pesky gnatz-sized fighters to giant ships of the line. The ships aren't the polygon constructs used in games like *Elite*, *Starglider*, *Federation*, or *Xiphos*, either. They look like real ships—multicolored and odd-shaped—and once they've taken a couple of hits against weak shields, they'll begin to disintegrate like real ships. A capital ship looks like a great slab of metal hanging in space, and nothing blows up as gorgeously as a Kilrathi destroyer. The ex-

Continued on p.72

We left off last time about two-thirds of the way through *Lure of the Temptress* (Konami, \$49.95) with Mallin offering Diernot a job. Take it—a job's a job, after all—and he'll turn over the book he wants you to take to Morkus. That name should ring a bell. (Didn't the Skori tell you something nasty about him when you chatted them up as Selena?)

So this time, don't do as you're told. Instead, take the book to the monks—Toby in particular. (Bet you were wondering when we'd get to them.) They'll reward you and bring you up to date on a particular dragon—namely, on the recipe to bring him under your control. Off to Goewin's herb shop,

then, to put it together.

Oops. Seems Goewin doesn't have any cowbane. Ain't it always this way with recipes in adventure games? You can find it two ways. The honest way is to have a talk with Luthern's voluble old mother or to send Ratpouch (who's still hanging around) to do it for you. The dishonest way is to make a beeline for the flower bed in front of the forge. Either way, take the herb back to Goewin, and she'll make you a nice herbal milkshake.

You don't know where the dragon is, but someone else does. The subject's come up before in conver-

CRIB NOTES By Peter Olafson

sation with Grubb (the fellow lounging around in front of the Magpie). He'll send you off to the Weregate—which is closed. Great. Thanks for the sour persimmons, cousin.

However, Ultar at the Severed Arms is now prepared to mutter something more useful than his usual nonsense. He'll name the gargoyles who flank the gate, and Fengael and Hammawen will tell you that they're supposed to let only women through. (Ultar himself evidently went in drag—lots of cross-dressing in this game!) You know a woman—Goewin—and while this doesn't sound like one of her fav-

orite things, she'll go for it. You rescued her, after all. Open sez me!

Hey, new areas! And new puzzles. In the first cave beyond the gate, you'll find two skulls. The right-hand one opens the way to the green cave. Look at both skulls before you move ahead, so Goewin will know what you're talking about when you give her this next set of orders. Instruct her to return to the first cave, pull the left and then the right skulls, and return.

On into the blue cave. Pulling the left skull brings Goewin through, and once again, you bossy little misogynist, you'll want to send her back to the green cave to do the the left-right number with the skulls again to open

Continued on p.72

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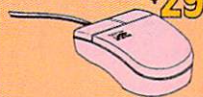
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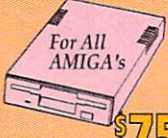
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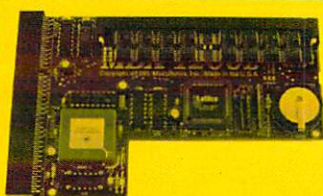
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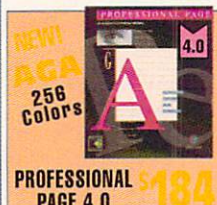
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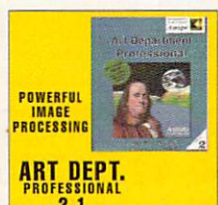
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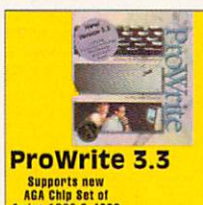
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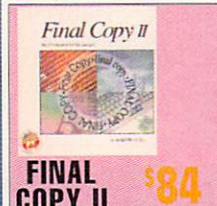
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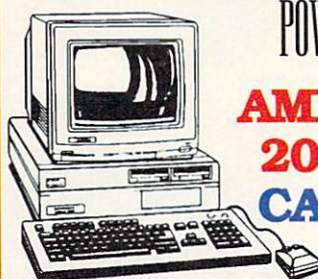
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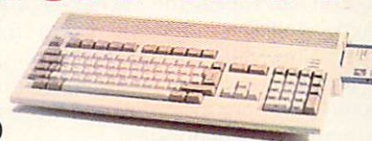
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From p.68

plosions in this game are almost physical sensations.

The missions start at a modest difficulty but quickly reach a level at which you're unlikely to complete them in one go. Unlike in Epic, however, here you're not simply booted back to the beginning to try again. (You can repeat the encounter if you thought to save your progress.) Wing Commander uses a "tree" structure that plots the story along different tracks according to your success against the Kilrathi. (If you fail too often, human forces fall back.) You should play once just to play—and damn the consequences—and then play again to win.

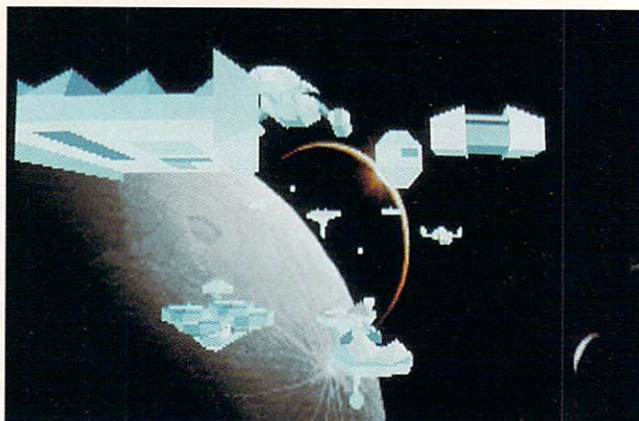
Some folks will grouse that it displays only 32 colors compared to the IBM's 256, but we're not getting short shrift. They're the right 32 colors. The difference is noticeable only in the bar and preflight scenes and the effect hardly unpleasant at that.

The music, by contrast, has a real John-Williams-style flair and easily surpasses the synthetic version that accompanied the IBM original. I also found the joystick control significantly tighter and the craft generally more responsive.

On the intermission screens, however, the cursor's speed is appalling and the fire button has to be double-clicked for an option to take effect. (They've taken out mouse support, but failed to kick the pointer into the background, so it sits in the playfield, immobile and semi-visible.) The major issue here, however, is speed. Bitmaps move more slowly than polygons. Wing Commander runs brilliantly on a machine equipped with a 68030 or '040, and an '020 is more than adequate. On an unaccelerated A500, however, it's decidedly slow; gamers using this machine may want to consider Epic instead.

EPIC

The Epic fighter flies incredibly smoothly on a basic Amiga; it has the same greased-wheels sensation as Ocean's earlier F-29 Retaliator (which is from the same programming team). It's a sort of super Starglider. They've kept the palette basic and the polygons warm and running, and on missions with land targets and a fixed surface to reckon the speed against, the game achieves the sort of reckless velocity more com-



You're in charge of the refugee armada in Epic.

monly associated with Euro-demos. And that's not the least of it. Epic has a glorious intro and cut scenes, music straight out of Robocop 3D, and shattering explosions that will make you blink. (Hey, explosions make a difference; they're a sort of interim reward.)

But, Epic just isn't in the same league as WC. In space, it flies like an arcade game, with very little vertical range. You'd have better luck doing loop-the-loops in a tethered plane at an amusement park. It's also small—just nine missions compared to WC's 40 or so. While they'll probably take you longer to complete successfully than the average WC mission (they've been customized in loving detail), they're always the same, giving you little incentive to replay the game.

It also doesn't go on hard disk. (Unlike the initial European version, the US version does recognize fast processors.) And I wish the story was more original. This saga of a refugee armada's trek across dangerous space appears to have been borrowed from *Battlestar Galactica*. Can anything inspired by Lorne Greene and Dirk Benedict be good?

Actually, yes. And Epic is—just not as good as Wing Commander.

Continued on p. 76.

CRIB NOTES

From p.68

the door into the last cave.

No skulls here, but there is one mean critter in waiting. Save your game (this may take a couple of tries), grab that axe and have at his midsection. He's about a head taller than you, but he's slow. Use it to your advantage and be aggressive. (I've also seen reports that the overhead chop method is effective.)

Once the baddie is history, head into the dragon's lair. Don't muck about here or your goose will be cooked, dragon-style. Use your potion immediately, and Diernot's wish is the big lizard's command. He'll tell that Selena has been possessed by a demon and then surrender the magical Eye of Gethryn, which is going to prove very useful

one of these screens. But now it's sleepy-time for this boy, so take your leave, using the left skull on your way out.

You may feel a bit at loose ends wandering around Turnvale at this point. I suggest just talking to your allies. It seems Luthern's plot isn't the only one afoot; the Skori have a score to settle with Selena as well. Mallin can put you on to it. Wait outside the shop in the marketplace until one of these goblin relatives comes calling. After he enters, peer in the window—I love this feature. You'll overhear him moaning to proprietor Ewan about the lack of food and urging him into a barrel bound for the castle. Once the Skori's gone, offer to take Ewan's place. *Voilà*: You're in the castle basement and into the endgame.

Note the wine barrel in the left corner. You can't actually do much here at the moment, so visit the kitchen. Here you'll find some fat (in the carcass), some tongs (close by), and a malleable young 'un named Minnow. Back in the cellar, use the tongs to pull the bung from the barrel, and now have Minnow tell his boss that there's someone in the cellar. This has the benefit of being true. The Skori are all drunken louts at heart, however, and this one will slurp up the wine and fall asleep. (Naturally, you'll want to be as inconspicuous as possible while this is going on. The cellar's right corner should do nicely.)

Don't throw Minnow back just yet. Now you just have to find Selena, and you'll need his help again. Across the dining room, you'll find

a gatehouse with some rusty machinery. The fat should prove a good lubricant for that lever; have Minnow pull it as you turn the winch. This lowers the drawbridge and opens the path to Selena.

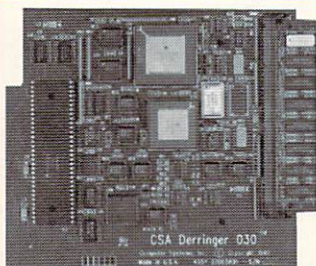
Oh, dear. There's one more thing. There's this other critter on the bridge, so save your game and have at it again, using the same basic moves as in the caves. Then press on to the left and let nature (and the end animation) take its course. It's a rather neat bit. I guess the title had a point after all, eh?

That's it for this issue. Next time, as promised, we'll visit one of the shadow lands. I just haven't decided which: Shadowlands itself or Shadow of the Beast III. □

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SHORT TAKES By Peter Olafson

ZOO
UCHES
GIGER-TETRIS

The first AGA games have started to trickle in, and as you might expect, they're a rather mixed lot. The first commercial offering is an enhanced version of Gremlin's Zool (about \$35). He's the ninja ant who runs around zapping blobs and picking up sweets. (He's an ant, after all.) It's a grand old platform game of the sort practiced by Mario and Sonic, with sticky fingers in lieu of the former's inveterate cuteness and the latter's demonic speed. The graphics, while good, are a little too childish for my taste—the poster and stickers enclosed with the game give away the intended audience—but it's also a bit tougher than standard platform fare. If you already have the original Zool, I wouldn't bust a gut racing to feed this to your A1200. The changes seem to be only cosmetic: elaborate backdrops where none existed before (which have the effect of better camouflaging the game's critters), more music, and the same play as the original.

Roger Uzun's freeware UChess (widely available) is very pretty, keeps getting better (the latest is version 2.25), and boasts a creditable record against reputable, commercial chess games. Trouble is, its system requirements are a bit on the video workstation side—10 megs for the full-blown "L" version and four for the standard version. How about a two-meg version for us Idiot's Mate specialists, Rog?

Finally, there's Giger-Tetris, which I've found (as TETRIS.DMS) only on

The Forge, an excellent BBS in the Kingston, Ontario area. It's from a Danish shareware outfit called Panic Productions and is a glossy version of the classic falling-block game with one of the Swiss artist's alien-woman-in-black-scuba-gear paintings as the playfield backdrop. Just the thing to play during a break from Darkseed. And stylish, too.

THE ADDAMS FAMILY

It's showtime! Look out behind you, Mario. Gomez is creeping up. The leader of this odd brood wears the same crazy, devil-may-care grin throughout the game. It's as though he's having fun, and well he should. This Ocean production (\$49.95)—inspired by, but not truly based on, the ineane movie—is light, frothy stuff: huge levels, tons of secret areas, interesting challenges in jumping and swimming, and immediate access to many regions via the central stairway of this ramshackle house. At the same time, it's all a bit spartan and broadly drawn for this sort of game, and I suspect more could have been done with backgrounds and sprites.

POPULOUS II: THE CHALLENGE GAMES

Were this data disk from Electronic Arts simply a bunch of extra worlds to take over in Populous II, this review would begin and end with one sentence: More of Populous II. To be sure, 500 very nice new worlds have been



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But that's only half of *The Challenge Games* (\$29.95). Also provided are 42 problem-solving "challenges" keyed to survival of your itty-bitty people rather than simple demolition of *The Other Side*. This is a wonderful twist, making for almost a whole new game. (It does require *Populous II*, however.) Highly recommended.

MULTIPLE WESSONALITY

The folks at Wesson International apparently don't do things halfway. I was expecting a couple of data disks for their *Tracon II* air-traffic-controller sim when a bulky parcel turned up and no fewer than 15 of them spilled out (\$19.95 each). They cover a very healthy portion of the globe, with three for Australia alone. This is sort of akin to subLOGIC releasing scenery disks for the whole earth, plus bits of the moon and Mars, in one bash. An act of dedication if I ever saw one. Bravo.

Recantation Dept.: Apparently the voices in the parent game don't use the Say utility, as I claimed in the review a few issues back. They just sound as though they do.

ASHES OF EMPIRE

Mike Singleton strikes again and, once again, hits home. *Ashes of Empire* (distributed by Electronic Innovative Design; about \$50)—a vast mix-

ture of strategy, arcade, and resource management—is basically *Midwinter III*. You've been enlisted to stabilize, province by province, a none-too-well-disguised version of the post-Cold-War USSR. That means 3-D travel and combat in scads of different vehicles, negotiating, and stockpiling supplies.

That task is dizzyingly complicated—even compared to the already complex *Flames of Freedom*—and could have used a proper keyboard overlay or just a quick-reference card instead of the punch-out cardboard counters that we're supposed to place over the relevant keys. ("Lose me!" they scream at me.) But you'll appreciate the introductory NTSC video that leads you through the pacification of a sample province. Thanks a bunch, Mike. You just used up my spare time.

MEGATRAVELLER II: QUEST FOR THE ANCIENTS

The second part of Paragon's *Megatraveller* series is enormous—it has around 100 planets—and sometimes size itself is a blessing. In *Quest for the Ancients* (\$59.95) it's a mite dull. A lot of detail has been lavished on this game—like an on-line encyclopedia—but the myriad cities just seem too much alike, and it's hard to stay involved when the game creeps along at this speed. The nicest thing about the game is the "PAL" system, which, when enabled, allows each character to assume the role to which he or she is best suited in a given situation. It made me feel as though I was playing with other people—not just subroutines—and that feeling is priceless. Alas, the game's also a bit buggy. More than once I found myself trapped in conversations I couldn't escape except by rebooting. ■

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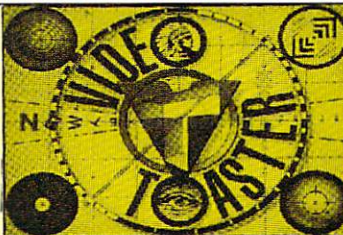
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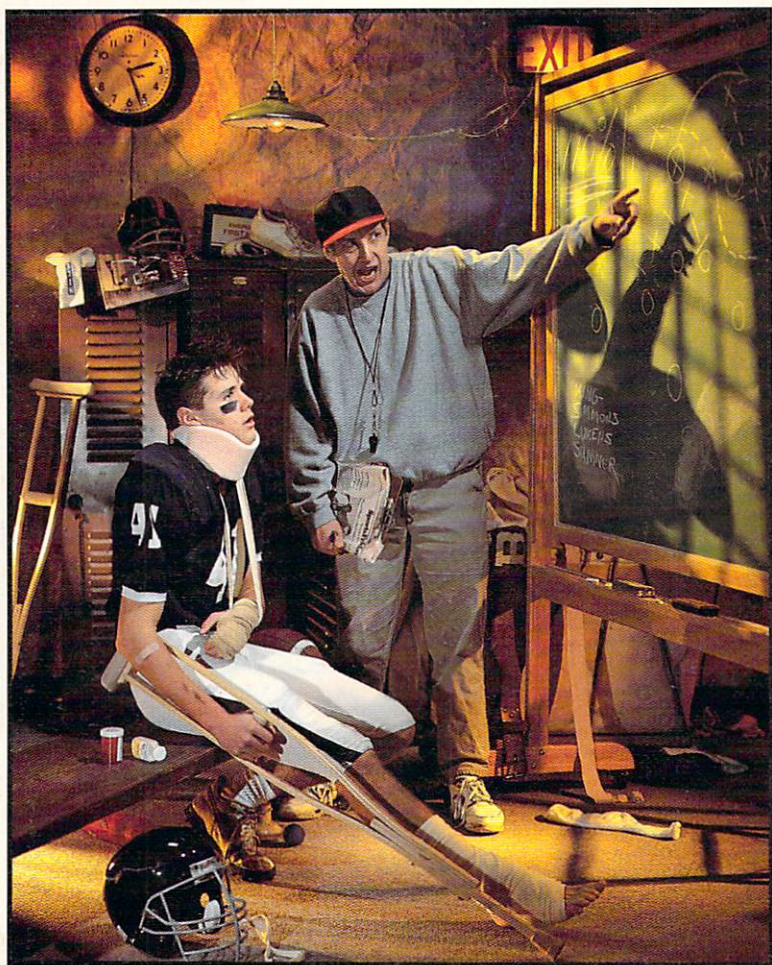
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HELP KEY

Will the AGA machines send the A500 hobbling off to the home for hi-tech has-beens? Also, CD-ROMs... and Fish.

By Tim Walsh

THE A500: STILL FIERCE, OR FADING FAST?

Q. *As an A500 owner, I am concerned with its future, given the recent releases of the A600 and A1200. Will the A500 fade into oblivion, much as the A1000? Should I get one of the new machines?*

Joseph Isaia III
Carpentersville, IL

A. Last month, I fielded common questions I've received from A2000 and A3000 owners who've wondered if the A4000 meant the demise of their machines. A500 owners—who, incidentally, constitute the bulk of our readership—share these concerns, especially in regard to the A1200.

Reliable sources indicate that Commodore is no longer producing the A500—no big deal, really, thanks to third-party hardware companies whose economic well-being hinges on the A500 market. In short, third-party companies are ensuring a long-term future for the machine. Additionally, classified computer ads bloom throughout the year with A500 listings, providing sources for parts.

I never tire of telling A500 owners that they have the basic framework for not only a fiercely fast computer, but also one nothing else can touch at near the price. My well-documented opinion (see our cover story in June '92) heavily favors excavating the A500's stock 68000 internals in favor of something of the 68030 persuasion.

While the following hardly constitutes a comprehensive list of upgrade products, here are some proven ideas: For around \$500, you can breathe new life into your existing A500 system with a Cev Design XPander Chassis (\$129) and add Zorro II slots to it in the process, or choose ICD's Trifecta 500 EC (\$299) and add a low-cost IDE-type hard-drive controller. Loosen the wallet a bit more and opt for ICD's 500LX (\$349) to give your A500 SCSI drive compatibility. Whichever combo you

order, an AmigaDOS 2.1 upgrade kit (\$99 with ROMs, \$49 without) is a must. You could round out a sensible upgrade with either a low-cost (\$199) Supra Turbo 28 68HC000 or Preferred Technologies' Blizzard Board (\$259), for roughly a two-fold increase in processing speed.

For less than \$1000, you can upgrade big-time, and turn your A500 into a barn-burner with a Commodore A570 CD-ROM (\$499) coupled with a CSA Derringer 030 (\$249), or a GVP 530 Turbo 40 MHz '030 accelerator equipped with a 120MB hard drive (\$949). For \$1295, you could pull out all the stops and install a 28 MHz 68040, as in the 040/500 from Progressive Peripherals.

Upgrading to the A1200 as an alternative to hopping up the A500 is purely a personal decision. By the time you read this, Commodore may have ended their Power Up program for the A1200 (termination date: March 31, '93). There's no official decision (yet) to extend this program, which, for \$599, got you the A1200 with a copy of EA's DPaint IV and Softwood's Final Copy word processor. It's not the 68020-based performance of the A1200 that sets it apart from the A500, since the older machine can be made to outperform the newer one by leaps and bounds. Rather, the AGA graphics and Workbench 3.0 combination on the A1200 make it the most attractive, low-cost computer currently available.

However, if someone builds an AGA chip-set adapter for the A500...

FISHING FOR CD-ROMS

Q. *Last year, a company advertised the entire Fred Fish collection of freely distributable files on one CD-ROM for \$50. What is the name of the company? Now that more Amiga CD-ROMs are available, I'm ready to make the leap.*

Donald Lipman
Highland Park, IL

A. The company is HyperMedia Concepts (5200 Washington Ave., Suite 226, Racine, WI 53406, 414/632-3766). For those unfamiliar, the Fred Fish collection has been around since, well, since forever, and now numbers over 800 disks. With the whole collection on one CD-ROM, it sure sounds like a cost-effective media investment to me.

If you have a modem and a network account, however, you can also access the entire Fred Fish collection on line, since the series' disks are available through both Portal and Genie. There are two reasons why it's preferable to access it on line: First, it requires only a few moments to search for a disk (they're sequentially numbered) that contains a particular file or subject matter that you're seeking. The second reason is, while a CD-ROM can't be updated (you have to buy new ones as they're released), on line offerings are updated frequently. Almost as soon as a new disk is added to the collection, it becomes available on line. The on-line way seems like an attractive alternative to buying the collection on CD-ROM.

Finally, I'd like to pass along an inexpensive way to add a CD-ROM to any Amiga system: CDTV. While I haven't tried it, I've been told the Commodore CDTV units, which are easy to acquire through authorized dealers and are now being sold at drastically reduced prices, double well as CD-ROM players. Connect the CDTV to your Amiga via each machine's parallel port and use Software Distillery's freely distributable ParNet networking software and your Amiga to access the data on CD-ROMs in the CDTV device. (And, when you're done computing, if the CDTV is connected to your sound system, you can slip in a music CD and sit back and enjoy your favorite tunes!) ■

Got a question on Amiga computing that you just can't seem to unlock? Write to Tim Walsh at Help Key, AmigaWorld, 80 Elm St., Peterborough, NH 03458.

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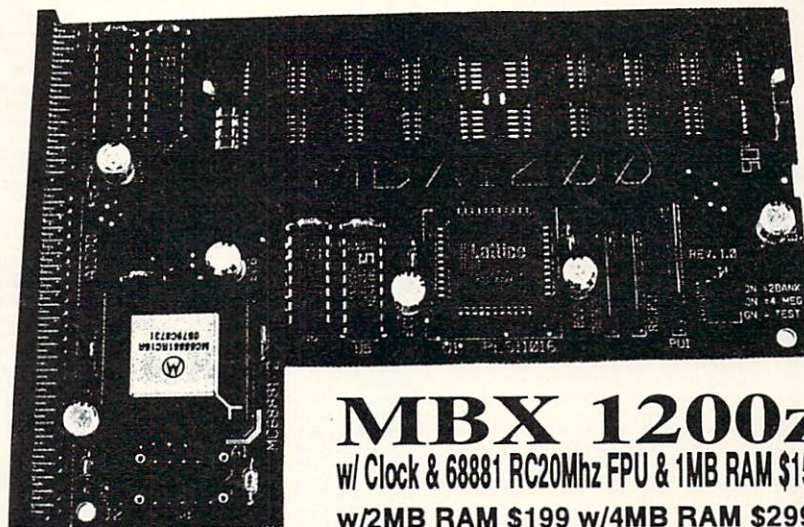
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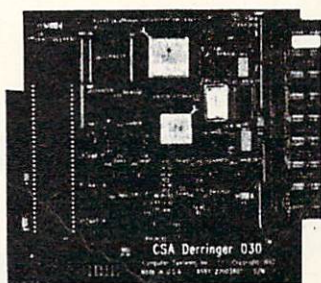
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good luck on your mission, SpyKiller - try and penetrate enemy lines with this game, and Retaliator - another great game **FD31: Games!** - Air Traffic Control - a good ATC simulation, Black Jack Lab - a full featured set of card games, ChessTel - play chess with your friend in distant and remote places with this game and a modem, labyrinth - a well done text adventure game (like an infomac game), and MouseTrap - a 3D maze game.

WB105AB: Workbench 2+ Extras #2 This set contains the programs that should have been included with WB2+. These powerful utilities take full advantage of the many new capabilities that are available in Workbench 2+. Includes: Tool Manager - a wonderful utility to add programs to your TOOL menu, Virus Protection - Degrader - Icon - Enhances Workbench's 'Show All' to display over 40 distinct icons for different types of files. Bitmap Font Editor, Screen Blankers - ala fractals and splines and swarming bees! Requester Enhancers and CPUBit. Two disk set, counts as two.

FD32: Flight Simulator - An instrument flight simulator for a DC10.
FD33: Arcade Games - Freddy a Mario Brothers type 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) - An outstanding 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: weeks.
FD36: Games - Cribbage Master - A great cribbage game and tutor, Spades - a well done card game, ChineseCheckers - A computer version of this classic, Puzzle - a slide piece puzzle game and construction set.
FD39A&B: Star Trek, The New Generation - This is a completely different version of Star Trek than that found on FD12. This one was created by the German author Tobias. Excellent!!! Counts as two disks. Requires 512K RAM.
FD40: Submarine Game - Seacontrol, one and a half years in the making, this is an outstanding submarine tactical game. Commercial quality, highly recommended.
FD57: Arcade Games - Includes 2 truly commercial quality games. MegaBall, an Arkanoid-ish game, features 5 musical scores and adding gameplay. Gravity Attack is a psychological trip through several different worlds--each different.
FD59: Game Potpourri - Xenon III is an almost exact clone of the commercial game of the same name...a great shooter. Crossword will take lists of words & automatically generate word-search puzzles for any Egon compatible printer.
FD60: Games - In Nebula, race over a 3D world to destroy enemy installations. Interferon, a great Dr. Mario clone. Enigma, is it a game or puzzle?
FD61: Games - Solitaire; great graphics, plays two versions. Kide; an interesting piece of eye candy. Extreme Violence; 2 player kill or be killed game. YATC; A Tetris clone with Artificial Intelligence. Genesis; create realistic 3D fractal worlds.
FD62: PomPom Gunner - An extremely smooth and well done World War II gunner simulation. Requires 1 megabyte of memory.
FD64: Games - Wizzy's Quest - a "great" 50 level game with great graphics, Cubus - a 3-dimensional Tetris type game (rotate and move in 3 dimensions). Husker Du - Colors and pattern rather than shape in this Tetris-esque game; 5 screens and 3 levels of difficulty. Requires Fat Agnus (1 Meg of Chip).
FD67: Arcade - Includes Llamator a well-done 'Robotron' clone. Hate is a 'terrific' Zaxxon clone with multiple levels/worlds and smooth diagonal scrolling...a 10!
FD69: MindGames - Had enough of shoot-em-up games? Relax and let these 21 games exercise your mind instead of your wrist.
FD71A&B: Star Trek: TNG Trivia Challenge - So you think you know The Next Generation, huh? Complete with fantastic sound effects and digitized images, this game even looks and sounds like a genuine Star Trek terminal! VERY thorough and complete! Counts as 2 disks.
FD73: Arcade Series - Intruder Alert! is a MULTI-level 'Berserk' clone. Features smooth gameplay, great graphics & digitized sound fx.
FD74: Arcade Series - RingWar is an 'Outer Limits' clone with vectorized graphics. MotherLode is a 'Lode Runner' clone with 50 levels! In BlitzTanks, they're coming at you from all directions!! Call in air strikes and use your heavy artillery to survive!

FD6: GAMES! - This disk is chock full of games including: Checkers, Cue, Gold - A new slant on the classic puzzle, Jigsaw - An enhanced version of Rush Hour - 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, MazeMan and Zonix.
FD10: HackLife - A dungeon adventure game. Considered a must-have classic. This is the 2nd release of this game. Great graphic interface. Play time several weeks!
FD11: Las Vegas and Card Games - Las Vegas Craps - The best Las Vegas Craps simulation ever written for any computer. Contains extensive HELP features. Also Thirty-One VideoPoker and more.
DD83: IBM - Not one, but TWO IBM emulators that will allow the running of MS-DOS software with Amiga programs!!! Comes complete with programs to turn your Amiga floppy drives into 720K IBM compatible drives.
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 Monopoly, Dominoes, Paranoias, 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, Trx - a Qix type clone.
FD17: Educational Games - This disk includes several games for youngsters including geography, math, science, and word games. Also includes Wheel of Fortune.
FD20: Tactical Games - MechForce: A game that simulates combat between two or more giant robots. 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.
FD27: Arcade Games - This disk is loaded with some great games. Includes: Racerama a great racing car game with ten different courses, MiniBlas a helicopter gunship type clone. Shark in the same class as frogger, and SBreakout the original breakout with more.
FD29: Shoot'em up - WWI - you're the pilot of a WWI plane flying through enemy territory, you've just been spotted,

Bomber is the classic game, "Kaboom" redone with an Amiga flare. All of these games are excellent!
FD82: Intrepid - In the Arctic ice, you control a tank on a mission to rescue hostages in this superbly crafted Amiga original.

WORKBENCH DISKS

WB4:Telecommunication - This disk contains several excellent pd communication programs: Access 1.42, Comm 1.34 & Handshake 2.12a.
WB5: Fonts #1 - Several fonts (35) for the Amiga, also included are five PageStream fonts and ShowFont - a font display program.
WB6: Fonts #2 - ShowFont allows you to quickly and painlessly view all 256 characters in a typical font. Includes large AmigaDOS system fonts (many up to 56pts).
WB7: Clip Art - This disk is loaded with black and white clip art. Art includes, trees, watches, tools, US and State maps, and more.
WB9: Icons - Truly a multitude of various types and kinds. Also includes IconMaster, IconLab, and others great utilities to help generate icons.
WB10: Virus Killers - The best: VirusX(4.0), Kv(2.1), and ZeroVirus III.
WB12: Disk Utilities - This great disk is loaded with wonderful utilities for everything including making disk labels, disk cataloging, disk optimizing, disk and file recovery archive and organizing, and all sorts of file manipulation. A must have!
WB13: Printer Drivers and Generator - over 70 different drivers (including HP LaserJet 3840), also includes a printer-driver generator.
WB15: Business - This disk contains a spreadsheet, a database, a project/time management program and financial analysis (stocks).
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,TextED(v2.8) an enhanced Emacs type editor, and a spell checker.
WB22: Fonts #3 - Several more great fonts. These, like the other font disks work great with DPaint and WYSIWYG word processors.
WB23: Graphics and Plotting - Plot, a 3-D 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.
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 use 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 do 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 producing stunning graphics. Includes, MandelMountains - a realistic terrain generator, Fracgen - generate recursive fractals from user input, Mandelbrot and Tmandel - two fast mandelbrot generators, also Mostra - the best IFF display program to date. Sound - a great IFF sound player, will play anything.
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.

SPECIAL PRODUCT!

QT1: The A64 PACKAGE - A very complete Commodore 64 emulator. Supports any CPU and is fully compatible with WB1.3 & 2.0. This version includes a special adaptor that will allow you to connect your 64's 1541 disk drive to your parallel port of your Amiga for total emulation. Two disk set, counts as two. Special price \$49.95 - including hardware.
WB32: 3D Graphics - This disk contains several neat programs to use with your 3D modeling/raytracing programs 3Fonts - Full vector font set for use with 3D programs, FontMaker - make 3D fonts from any system font, Make3DFF - create 3D shapes from any image, Dumptof3D - create 3D animations preserves pallet, and World3D - a demo program of a front end for use with DKBRender.
WB36: Graphics - On this disk are several programs to create stunning graphical images including, MPaint - creates swirling galaxy images, Boxes - produce an unlimited number of various images that a symmetrically similar to a rose, SimGen - displays those spectacular images as part of your workbench, and RayShade - a very good raytracing program, create your own beautiful 3D graphic models with this one!
WB37: Educational - Educational games and puzzles that cover math, geography, spelling, and books. Ages 6 - 15
WB38: Plotting and Graphics - Plotxy is a powerful full featured plotting package. Used by many colleges and universities. Highly recommended. Plans - a incredibly well done Computer Aided Drafting program, very full featured. Tessellator - a program that helps generates fantastic looking, recursive M.C. Escher type pictures.
WB41: Music - MED an incredibly well done, full featured music editor. Create your own stunning music directly on your Amiga. Similar to SoundTracker but better. Very powerful easy to use program. Version 3.20-compatible with WB2+.
WB43: Business - This disk contains AnalytCalc - probably the most powerful spreadsheet program on the Amiga. A full featured spreadsheet with many features expected in a commercial package. Req. 1.2 MB
WB45: Clip Art - HighRes clip art with the following motifs - embellishments (borders, dodads etc.), people, & transportation.
WB47: Clip Art - Hires clip art. Motifs - hair, drafting, summer, animals and macdow.
WB48: Clip Art - Hires clip art. Motifs - Holidays, music, medical, and misc.
WB50: Animation - Seven of the best european style animations or "Demos", including - scientific 451, subway (a U.S. entrant, also our favorite), sunrise, thrdsdemo, tright, waves, and wove.
WB53: Graphics - Raytracing programs generate absolutely stunning realistic looking planes, rockets, buildings, ... and surreal images. C-Light is the most powerful EASY-TO-USE of it's kind we have seen to date. This is easily better, and more full featured, than similar commercial programs costing in the hundreds of dollars. Also, sMovie - a full featured video text title similar to ProVideo, Broadcast Title. Great video scrolling, wipes, special effects, and more...
WB54: Printing - This disk contains several routines to help with the chore of printing. Includes Gcode - 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 more.

WB55: Application - XcopyIII - a full featured disk copier, make backups of copy protected disks. RoadRoute - find the quickest route from one city to another, highway description included. Diary - a diary program like "Dougy House M.D.", Cal - a calendar program, Magman - a database tailored for artists and publications.
WB57: Animation - This disk has several "Demo" style animations. Including, Blitter, Lolly, Sun5, verligo, vortex, and xenomorph.
WB19ABCD: Font Set This collection contains over 100 typefaces for use with Professional Paper/TypeSetter 3 or PageStream 2.1+. These fonts will output to any laser printer or dot-matrix printer with no jagged, thanks to outline fonts. Very pro-looking. 5 disk set counts as 4.
WB62: Midi Utilities - Several useful midi utilities including, programs to transfer to and from several music programs to midi, a midi system transfer, a midi recorder with real-time display, midi info, file sequence player, and a few scores.
WB63: Disk Utilities #3 - Several highly recommended programs to aid in removing duplicate files from your hard drive, performing file backups, Binary editing, fast formatting, file recovery, disk track recovery, and forced disk validation of corrupt disks.
WB66: Icons #2 - Lots of neat icons. Also, several wonderful programs that let you create your own icons, modify and manipulate icons and info structures.
WB69: Music - 90 minutes of classical and modern electronic music for you Amiga.
WB75: Music - over 100 instruments files (.inst) and sample sound files (.ss)
WB79: Home & Business Accounting - Includes Xcbact - the most complete checkbook accounting program going, LDCalc - this well done calculator has a very large display and operates from the keyboard or mouse, Mileage master - monitor your automobile mileage with this mileage log, Grammar - a grammar checker, and Wordtime - find out what it is that is wrong with your global files.
WB81: Great Applications - DataEasy a very easy to use, database program. Don't let the ease of use fool you, this is a very full featured database program including full printer control to address labels and mail merge applications. Also includes, TypeTut a good typing tutor, RLC a full featured label printer, Banner, a multi-font banner maker, and Budget a home accounting in a program. Highly recommended.

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WB82: Animations - Four full length, well done "movie" style animations. Including, Coyote, JugglerII, GhostPool, & Mechanix. 2 disk set, counts as 2.
WB93: Workbench 1.3 Extras #2 This disk contains the utilities that Commodore should have shipped with the Amiga; VirusX4.0, Snap, FixDisk (recover corrupt/deleted files), Disk Optimizer (floppy & hard), MacHill (screen blanker, hotkey, mouse accel., macro, clock utility), GOMF (a gurbuster) and PrintStudio.
WB95: Checkbook Accountant 2.1 - This is definitely commercial grade; we've seen many checkbook programs and this is absolutely the best. Full budgeting, transaction recording and report generation.
WB96: Dupers - Contains XcopyIII & Nib which will backup copy-protected programs. FreeCopy removes copy protection from several programs, and SuperDuper will crank-out fast AmigaDOS copies.
WB99: Lifestyles - Includes AGene-family tree program that tracks up to 600 people/marriages/etc. Landscapes is a CAD program to create gardens/landscapes. Loom simulates an 8 harness loom; experiment with pattern design with instant feedback.
WB102: Telecommunications - Contains the programs NComm 2.0 and VT100-29B. Zmodem protocols, XPR protocol support, full VT100 emulation. NComm's script language is so powerful it can create a full-featured BBS system.
WB106: Home Manager - This is a great all-in-one address book with an autodialer/rtcp2d to list all appointment scheduler/home inventory database and phone number dialer.
WB108: OctaMED - This breakthrough program doubles your Amiga's sound capabilities from 4 channels to an ear-popping 8 channels! All the renowned editing capabilities of MED plus 4 more channels and you thought your Amiga sounded good before...you ain't heard nuthin' yet.
WB115: Amiga Beginner - You asked for it! A complete tutorial for the beginner on using the Amiga. Starts you off at the power-switch and takes you through to the CLI/shell and all points in between. Bonus! Also included are 16-color icons to replace every icon in your 2.0+ Workbench.

WB109: VerseWise - Display, search and print The New Testament.
WB113: Sid II - Why pay 40 bucks for a directory utility, when this one will do it all plus much more! A truly professional-caliber program. Sid 1 was our best, now completely rewritten, Sid 2 will astound you.
WB114: Fonts #4 - Contains 36 bitmap system fonts.
WB115: Telecommunication - If you have AmigaDOS 2.04+ and a modem, then this is THE program for you. Term totally conforms to the User Interface Style Guide for 2.04, has an AREXX port, and supports all popular file-transfer protocols through XPR libraries. We wish all programs were this good.
WB116: Databases - This is what you've been waiting for! Contains 5 uniquely specialized database programs for tracking: Videotapes, CD's, Magazine Articles, Comic Books and Trading Cards!

DEV DISKS

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, Lharc, Lhwpak, Pkax, PowerPacker a must have by all, Zip, Warp, and Zoo. Also IFFcrunch an excellent compression for IFF files.
DD71AB: C Compiler - This disk contains DICE, Matthew Dillon's full featured, powerful C compiler & environment. 2 disks, counts as 2.
DD86: The Programmer - Includes GadTools and RETOTools which will allow you to create your user interfaces and then the program will automatically generate "C" source code or Assembly-code. Requires, and writes code for, AmigaDOS2+.
DD89: UEdit - Probably the most powerful text editor ever written for the Amiga. Previously commercial, now public domain. Req. 1 MB.

VIDEO DISKS

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From p. 6.

Brian Berg, who runs the multimedia lab at Arizona State University, has good advice for the Amiga artist wannabe: "Prepare a strong portfolio of slides, prints, and videos. Devote the time during your education to this task before actually entering the job market."

A college atmosphere may not be for everyone. As Mike Hanish observes, oftentimes, life experience and a unique point of view may serve you better than a degree. Other informational and learning opportunities exist outside of the academic environment:

- check out your local Amiga users club to see if it contains a special-interest group dedicated to graphics and animation
- contact your nearby Amiga dealer for computer courses being offered
- attend computer shows, where professionals may be teaching seminars and workshops on computer art
- stay informed about the constantly changing computer art industry
- frequent the on-line electronic networks, which offer areas for Amiga users, as well as for artists
- become a member in a professional (computer art) organization

Finally, Hanish advocates that aspiring artists should "find people whose work you admire and study or connect with them."

Above all, stay tuned to what's happening in the world around you. "To design effective computer graphics, you need the intuitive ability to perceive what is eye-appealing. Try to recognize the techniques used to create the commercials, print ads, and demo reels you view," comments Berg.

Rick Manasa has some advice for those who might consider themselves "out there" and who find traditional vehicles too limiting: "Watch the credits at the end of movies that display dazzling graphics (or the kind of graphics you like). Sometimes listed are 'cowboy animators' who set up shop on their own, because they didn't fit in the mainstream. Contact them for advice."

Colorado student James asserts that while we should learn from the work of others (classic cartoons and animations, for example), it is best to "try to have your own sense of style and use of color—it may help you stand out from the pack and get the career you want." Also, he adds that it doesn't hurt if your work

reflects an appropriate sense of humor.

But most of all, declares Bruce Elliot, "Don't wait. Buy an Amiga and some basic software and try out your talents. Most software programs are easy to master and allow you to do things impossible to do in the more traditional materials."

Computer use is not only an inventive way to accomplish tasks, but computer skills are fast becoming requirements for success in today's high-tech society, both in the classroom and the workplace, where companies are actively seeking computer-literate employees.

No matter what direction you take, computer knowledge is essential. As one of our Amiga artists says, "computers are steadily making inroads into nearly every aspect of the art and animation culture, making a solid knowledge of computer animation and art essential to obtaining a career as an artist."

Dennis Brisson

Dennis Brisson
Editor-in-Chief

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THE LAST WORD

Kudos, complaints, comments, concerns, and contributions from our readers.

SLIGHTLY OFF KEY

I was distressed to find that Gene Hamm's "Music of the Spheres" (Mar. '93, p. 53) was slightly tarnished. Although his circle of fifths fit me like a glove, a technical error in the diagram left me composing some highly unusual chords.

A few days after reading the article, I showed my choral director Hamm's article. She thumbed through the pages, tried a few chords on the circle and shook her head, saying, "This is wrong." I was crestfallen.

As it turns out, the diagrams of the circle of fifths were misdrawn. The positions of B flat and E flat in the major chord progression in the outer rings of the diagrams should have been reversed. They should read C, F, B flat, E flat, A flat, and so on. Having made this switch, Mr. Hamm's theory once again fit like a glove.

Brian Metcalf
Sandy Hook, Connecticut

We've received a bunch of letters about this problem. Several professional musicians also expressed dismay that the article seemed to suggest that the Amiga could make you a composer "whether you know anything about music or not." While we stated upfront that it was for "people who want to create music on the Amiga, but know little about music composition," whether you're a novice or a professional, B flat isn't E flat, and vice versa. Our apologies. —Eds

LOSING SOME ZIP

In the March On-Line Scan section, Tim Walsh referred to several archival programs, one of which was PKAZip. *AW* readers should know that P.K.Ware will no longer be supporting the Amiga. Yep, PKAZip 1.0 is the first and last version of the program for the Amiga, according to the message I got through P.K.Ware's BBS. It's too bad, too, because PKAZip is one of the best archival programs ever written for the Amiga. I hope revisions will come from other

programmers so Amiga users such as myself can continue to take advantage of the thousands of "ZIPped" programs available on BBSs.

Mark A. Tomany
Minooka, Illinois

KEEP CARVING, CBM

While some see the introduction of a new line of Amigas as creating a confusing list of options, I see the new machines as welcome additions from a company determined to carve out a sizable niche in the marketplace. Even the bookstore in my town now shelves

*The A4000 is well suited
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multimedia workstation.*

two Amiga-specific magazines (*Amiga-World* and *Amazing Computing*), which I consider a step—no matter how small—in the right direction.

Jim Heffernan
Harrisonburg, Virginia

We think it's a giant step! (But gee, Jim, did you have to go and mention that other magazine by name?) —Eds

GREAT AT SCIENCE TOO

Recently I read an interesting survey in *Personal Engineering and Instrumentation News* in which the Amiga was mentioned. Apparently, 4% of the scientists and engineers who responded claimed the Amiga as their computer of choice. (I was one of them, incidentally.)

The A4000 is well suited for use in

scientific laboratories as an instrument controller and multimedia workstation. This is important in an area where technical, abstract information needs to be gathered, analyzed, and finally presented in an easily understandable way, especially to a potential client.

We need *AW*'s continued support to raise the scientific community's awareness of the Amiga's high potential.

James J. Yuzwalk
Livonia, Michigan

STILL THE ONE

In your February *OverScan* piece on the CyberArts conference, Patric Hedlund claims that most multimedia development and applications are for the Mac. I've been selling multimedia products to studios, including Disney and Warner Bros., for quite a while (all the major platforms), and I can tell you that the Amiga is still easily the leader in multimedia. QuickTime for the Mac doesn't even come close to the professional quality of the Amiga.

Adam Strange
Valley Village, California

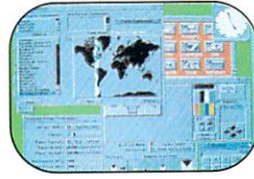
What Mr. Hedlund said was that most American multimedia developers use a Silicon Graphics workstation or a Macintosh, but he preceded the statement with John Donovan's point that the Amiga, because of its "inherent architectural advantages," among other things, made it "the power platform for the future of multimedia."

IS IT IN THE CARDS?

Your February editorial, "Commodore Users at the Crossroads," forecasts what I think most high-end Amiga owners want: AGA for the A2000 and A3000. An AGA card would be a total winner. For Amiga owners who can't afford to upgrade to an A4000 it would seem to be the logical next step.

J.C. Comerford
Woodland Hills, California ■

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