Avid

The AMIGA® VIDEO Journal

Vol.# 2 - Issue #6
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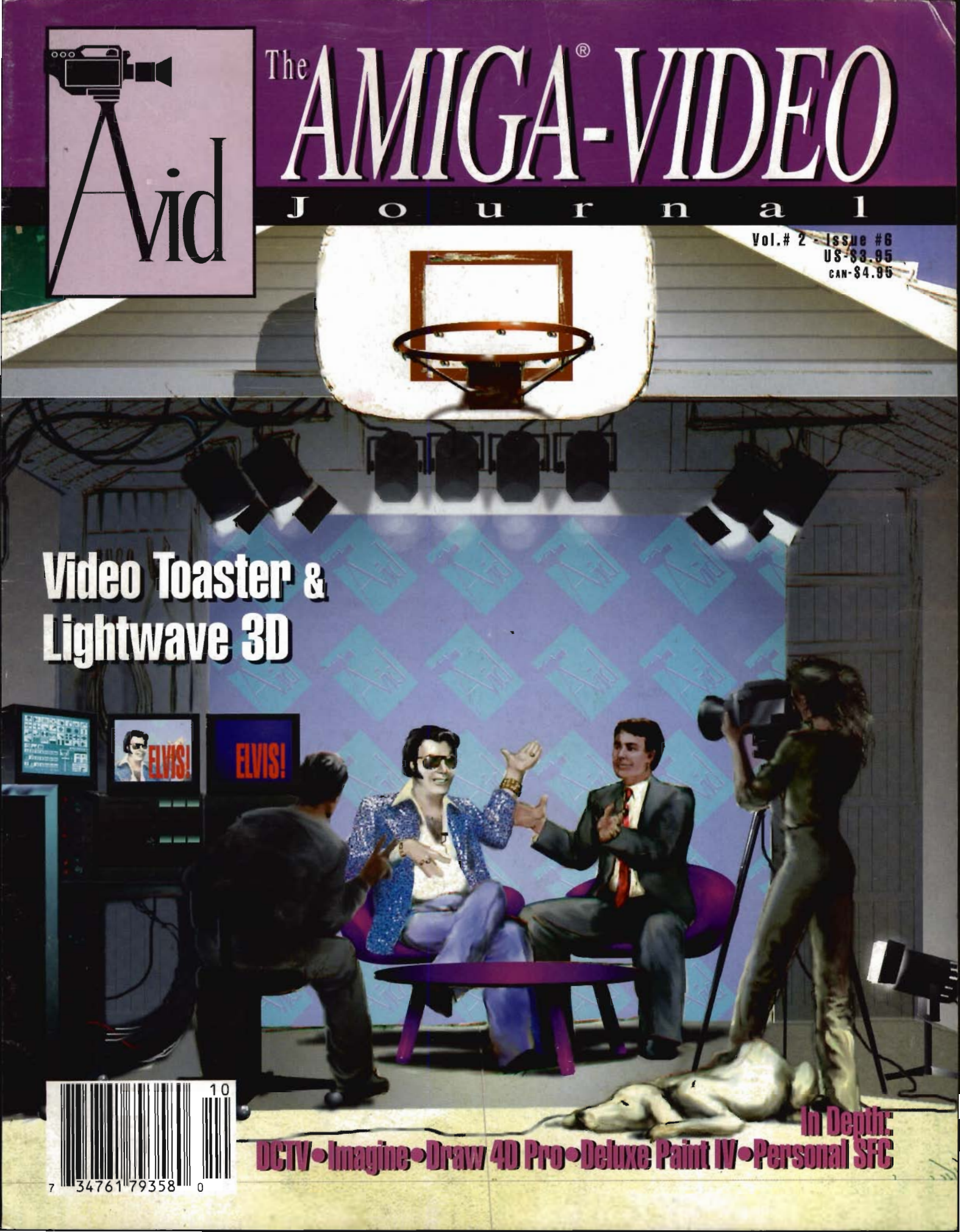

Video Toaster & Lightwave 3D

In Depth:
DCTV • Imagine • Draw 4D Pro • Deluxe Paint IV • Personal SFC

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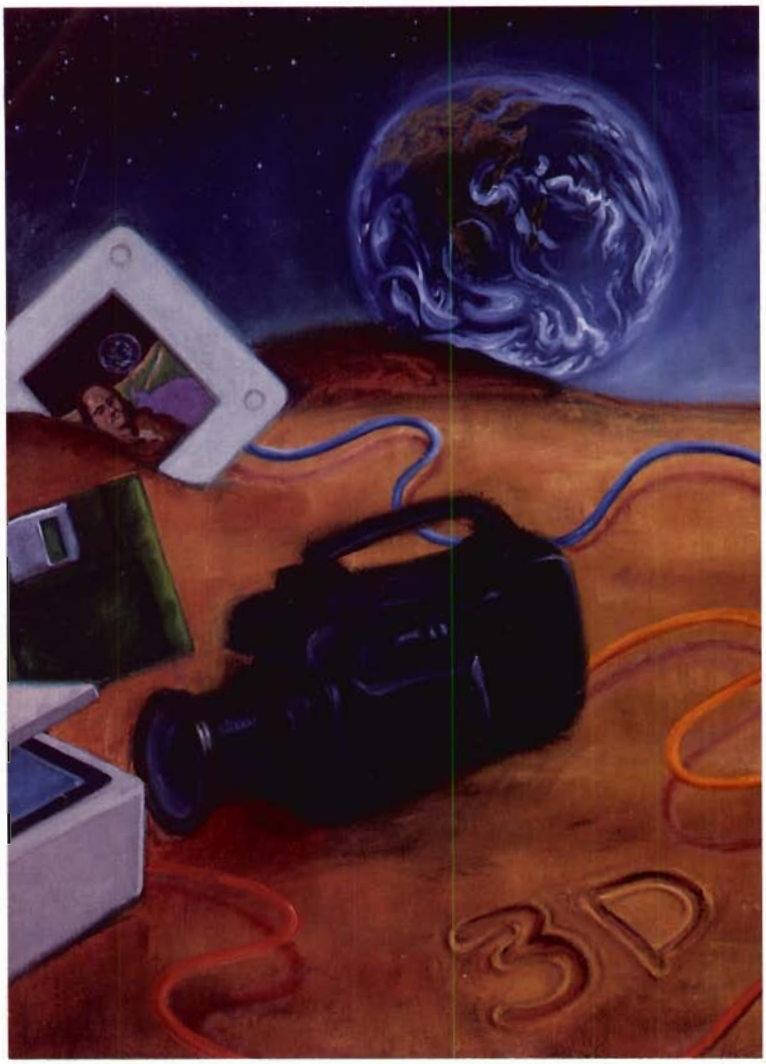
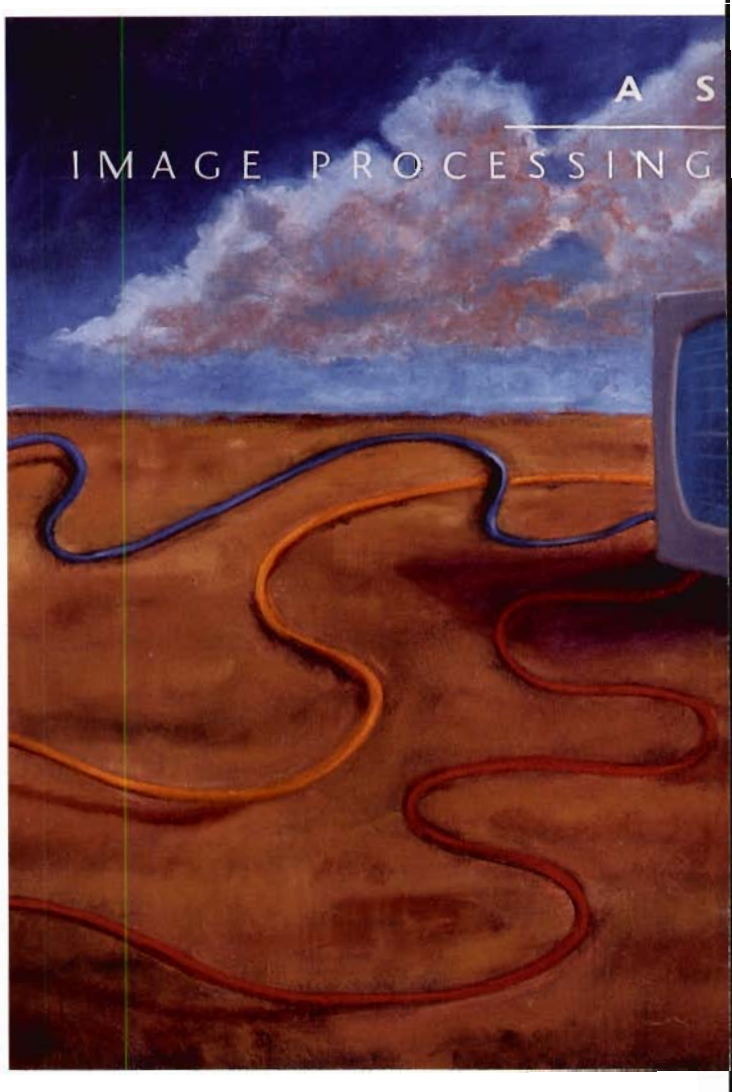




WHY WE INSIST ON VIEWING OURSELVES

CONCEPT...

Some may say our perception is a bit bold. But for Amiga users, it perfectly describes where we fit in the image processing world. Directly in the center ... joining input, processing and output.

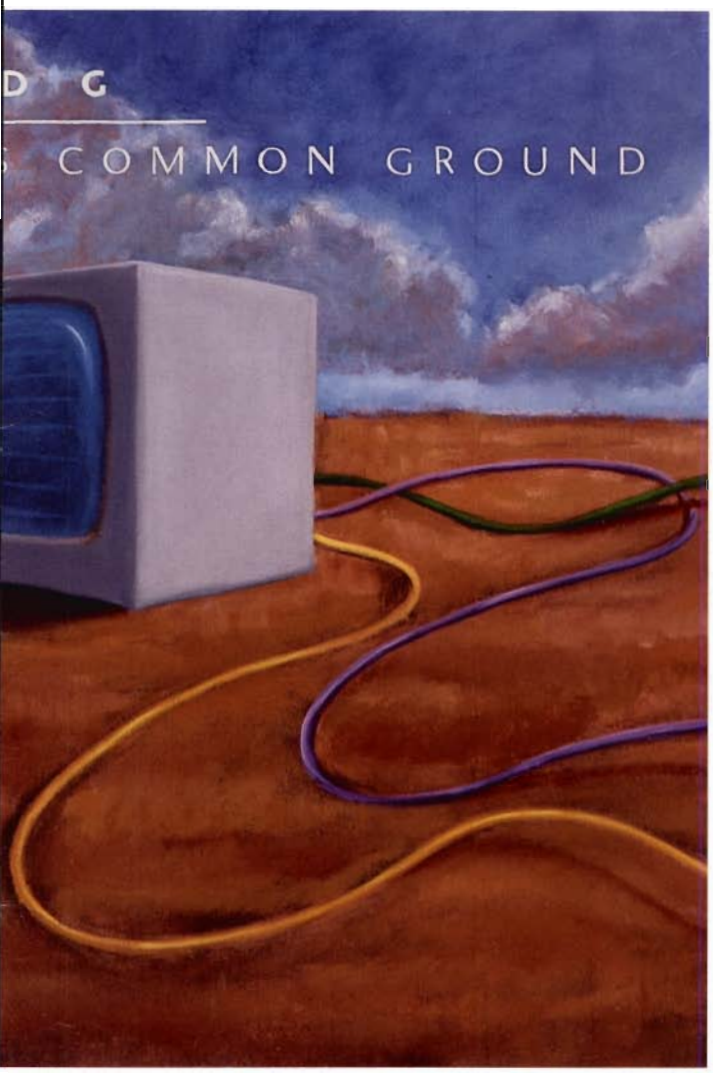
Our 24-bit image processing software, ***Art Department Professional (ADPro)***, gives you the power to import from video digitizers and color scanners. Or input and save to a wide variety of file formats including PCX™, IFF, GIF™, TIFF* and TARGA®*. You can even output to video, film recorders or PostScript® printers. And you can expand input and output capabilities as your needs grow.

SOURCES...

ADPro also solves many complex imaging problems which have plagued the Amiga artist. Modify dynamic range to adjust color vividness. Create professional backgrounds. Remove unwanted pixels in one simple operation. Make aspect corrections or eliminate jagged edges with powerful scaling and anti-aliasing tools.

*TIFF and TARGA support are part of the professional conversion pack. Available separately.

925 STEWART STREET MADISON, W



AS THE CENTER OF THE UNIVERSE.

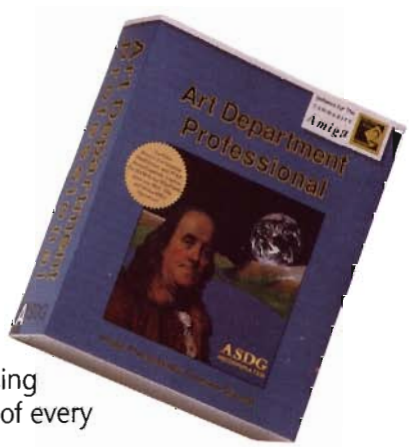
INPUT...

And merge images from different sources (in true color). ***ADPro*** solves these problems and more with a simple point and click.

It also supports the programming language, ARexx. So you can process hundreds of images automatically or set up your own shortcuts for often-used sequences.

RESULT.

Choose ADPro for professional uses. Or for an entry-level alternative, consider ***The Art Department (TAD)***. Both place the exciting world of color processing within reach of every Amiga user.



So, join us at the center of the universe. You'll love the view.

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KARA FONTS

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TOASTER FONTS 1: Six Disk Set - Sug. Retail $ 99.95
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*Video Toaster CG is a Registered Trademark of NewTek Inc.
TOASTER FONTS 1 requires 6.5 megs of Hard Drive storage. TOASTER FONTS 2 requires 6.1 megs of Hard Drive storage.

KARA COMPUTER GRAPHICS
2554 Lincoln Blvd., Suite 1010, Marina Del Rey, CA 90291 (213) 578-9177

KARA FONTS

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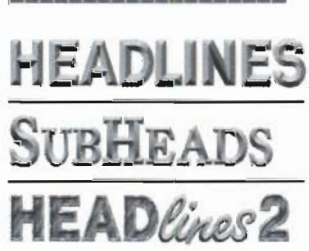

HEADLINES

10 Hi-res, up to 8 color, uppercase fonts in two sizes each (approx. 104 and 84). Font styles in CHROME, MARBLE, BRICK and GRANITE are dragable for added 3-dimensional effects. Other styles are CHISEL, WOOD, BEVEL, CHISELserif, CAST, and COLUMN.

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HEADlines2

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AnimFonts®3*

CAPSULE is a Hi-Res, 8 color, metallic, uppercase, contemporary, rounded gothic font, which "sparkles on" from the middle revealing characters to the top & bottom. Then, an "X" sparkle highlights each letter towards the right. A separate "X" sparkle for custom effects is included. Comes in both a keyboard and AnimFont with palettes of Chrome, Gold, Metallic and Silver.

ONE DISK - Sug. Retail $ 49.95

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BULLION is a Hi-Res, 8 color, beveled dimensional, highlighted, uppercase gothic font and comes in a keyboard and AnimFont. The AnimFont rotates unto the screen 90 degrees on the "Y" axis to the left while a glint of light goes across the face from left to right. When used as instructed, the glint travels continously across the word(s). Included are palettes of Gold, Metallic and Silver.

ONE DISK - Sug. Retail $ 49.95

AnimFonts®1*

ChromeSCRIPT is a Hi-Res, 8 color formal, sophisticated roman style script in caps and lower case and comes in a keyboard and AnimFont. Each letter of the AnimFont appears to be handwritten across the screen. A variety of treatments can be achieved with the included color palettes such as Chrome, reflective Gold, copper, bronze and other golden effects.

One Disk - Sug. Retail $ 49.95

*AnimFonts is a registered Trademark of Kara Computer Graphics. AnimFonts and STARFIELDS are compatible with DPAINT III, DVIDEO III and other programs that use the ANIM and Anim Brush format.
Requires 1 MEG (keyboard), 1.5 MEG (AnimFonts), 2 MEG (Starfields), 2 Disk Drives or HD+1 Disk Drive.

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Bars 'N' Tone

© 1991 by Jim Plant

In the past year, the Amiga has made tremendous gains in both market share and respectability among professional videographers. In fact, if the recent Video Expo in New York City is any indication, the popularity of the Amiga as a video production tool is at an all-time high. It is no secret that this surge in popularity is directly linked to the growing use and interest in NewTek's Video Toaster. While it is true that other traditional Amiga developers have recently introduced innovative and exciting video related hardware and software products, none of them have come close to capturing the mindshare (and the imagination) of users from both in and outside the Amiga community. Not only have the NewTekians come up with a truly revolutionary desktop video product, but they have also managed to come up with innovative ways to publicize and market it.

Besides the obligatory Video Toaster brochures and flyers (the latest of which are outstanding!) NewTek marketing has gone out of its way to create several extraordinary, larger-than-life demonstrations of Video Toaster technology at work. For instance, there is Penn and Teller's Guide to Video Toaster Etiquette which has been seen by tens (maybe hundreds) of thousands of trade shows attendees at Video Expo, AmiExpo, NAB, SIGGRAPH, CES, Comdex, MacWorld Expo, etc. There is also the Todd Rundgren music video "Change Myself" which was produced entirely with the Toaster and has received widespread exposure for both its musical and graphic

content. NewTek has also received a considerable amount of press from magazines outside the video/computer arena. I've seen references to the Toaster in everything from TIME magazine to Rolling Stone. These are some of the reasons why a company that employs maybe 80 people has been able to impact the professional video market in such a significant way.

The Toaster's mainstream coverage is drawing non-video people to the desktop video market at an accelerated pace. Individuals all over the country who are occupied by the communication of ideas are suddenly discovering that video, a medium they thought was too expensive or too technical, is far more accessible than they imagined. You can credit NewTek and the Video Toaster for the acceleration of this inevitable process.

Jim Spencer, the national sales manager for EE Times (Electronic Engineering) is one of those people who sensed the inherent communication power of video, but was not completely convinced that it could be cost-effective for his proposed applications. Then he heard about the Video Toaster and was compelled to learn more. Several magazine articles and a few trips to his local Amiga dealer convinced Spencer that a Toaster system was the answer to his video communication dreams. "If I had any doubts about the Video Toaster, recalls Spencer, they were dispelled after a trip to Video Expo. I was standing in line with a group of 60 to 70 people waiting for the show to open. When security finally opened the gate, the majority of those people, including myself, made a bee-line for the NewTek booth. That's when I first realized, hey, they really have something here!"

At Video Expo-New York, NewTek continued to spread the legend of the Video Toaster by handing out a free videotape called "Revolution". This outstanding demo tape, which also contains a copy of the aforementioned "Change Myself" was given to over 3500 Video Expo attendees. NewTek marketing exec, Mark Randall, commented, "I'm pleased with the response, but this is just the beginning. We plan to distribute over100,000 copies of "Revolution" in the next 12 months."

All signs indicate the NewTek will sell a tremendous number of Toasters in that same time period. Sheer and Chaskelson reported in a recent survey that over 70% of the readers of AV Video Magazine planned to buy a NewTek Video Toaster in the next 12 months (AV Video has a circulation of about 60,000 readers). These are the kind of numbers that are changing (revolutionizing!) an industry!

There are a lot of traditional video companies (manufacturers, dealers and producers) trying to figure out how to adapt and survive these changes. There are also a tremendous number of individuals who are looking at these numbers and dreaming up ways to take advantage of the new opportunities; to not only survive, but to thrive! One example of this type of entrepreneurial thinking can be illustrated by a subscriber letter I recently received:

Dear Jim,

NewTek's Toaster is a marvelous development in the world of video, enabling us ordinary mortals to master advanced video techniques. Todd Rundgren amazed us all with his demonstration of Lightwave's power in his recent music video. I have wanted to use some of those techniques myself, but the problem of sequentially grabbing and storing video frames with frame accuracy has proven to be a major stumbling block. I read a report of Todd's techniques and was intimidated by the sophistication and the great cost of the video equipment he used.

Confident that my Toaster and single frame controller had frame accuracy capability, I wrote a set of ARexx programs to sequentially framegrab. After many weeks of effort I was unable to achieve frame accurate results. A call to NewTek technical support revealed the reason. It seems that the Amiga cycles through a list of ports, constantly searching for an input signal (keyboard,

mouse click, etc). A frame accurate GPI signal's timing is degraded to plus or minus one frame because the timing of the grab is dependent on where the signal comes in the cycle.

If the GPI input signal is received just prior to the inquiry of its port, then the grab is done immediately. However, if the signal comes just after the inquiry, the grab is delayed until all other ports have been searched. There is also a problem in that GPI signals are supposed to be fed into the right mouse port, but the right mouse port is only capable of triggering effects (a mouse splitter must be built or purchased to enable the GPI to key the left mouse button with the pointer on the freeze button). On top of that, there is another problem because the grab is executed upon the release of the mouse button rather than its depression. Anyway, these are some of the problems facing the animator who wants to sequentially framegrab.

One of the solutions I found is to send your tape to a laser disc mastering company and have it put on a CAV laser disc. It is then possible to single-step through the disk and sequentially grab the desired frames. Of course, this solution comes with its own set of problems: Only industrial-strength laser disc players with RS-232 serial ports will work and these can be expensive. Also, some method must be devised to automate the single frame step function in sync with the Toaster's framegrab/framestore cycle. Additionally, mastering a laser disc costs some few hundred dollars, adding to the job cost and precluding "playing around" with it to learn.

Dissatisfied with the laser disc solution, I continued to brainstorm, bothering people all over the country with questions. Eventually a frame accurate set of hardware/software was developed, and I am now able to successfully framegrab/framestore with single frame accuracy. Knowing that anyone out there who has tried to sequentially framegrab has come up against these problems, I am offering this service to those who want to use the advanced capabilities of the Toaster. At the present, I can only convert VHS and S-VHS tapes, but other formats will be accomodated if the demand is warranted. Frames can be sent on either Syquest or 31/2" floppy, in IFF or RGB format.

Sincerely,
Jack Fletcher
VideoGenics
(601) 846-0377

Mr. Fletcher's letter is a prime example of the kind of opportunities that Video Toaster technology is creating in the market. As the Toaster begins to permeate the professional video market, existing companies will adapt (the TBC market has reacted quickly) and new companies will spring up to service what promises to be a very large installed base of Video Toaster System users.

Speaking of the Video Toaster System (VTS), most of you are already aware of NewTek's efforts to penetrate the Macintosh market by developing software that allows the VTS to be directly controlled by the Mac. NewTek is also working on a similar solution for PC users. Look for NewTek to show a PC/Toaster connection at the upcoming Comdex in Las Vegas. This multiplatform Toaster connectivity really excites me. I get all warm inside when I think of all those Mac and PC users with Video Toaster Systems (aka the Amiga) on their desks. Amiga-video hardware and software developers are sure to benefit by "coming along for the ride", and taking advantage of the inevitable and natural tendency for new VTS users to suddenly "discover" the Amiga in their workstation.

All things considered, this is a great time to be an Amiga videographer. You are on the cutting edge. Society as a whole is beginning to wake up to the accessibility and the power of desktop video. They will be looking to you, the DTV pioneers (and hopefully giving you money) to teach them production skills and to help them understand the tools that you are intimately familar with.

Jim Plant /Editor

Dear AVID,

I read an article in another magazine sometime back mentioning the use of delay lines to fix a timing problem created by using an Amiga in a system. A delay line is a device used to artificially bring sources (camera, TBC, CG, etc.) of the system into correct time with each other. Since delay lines cost in the hundreds of dollars and most are designed for specific compensations of delay range, I want to tell you about the formula used to calculate approximate delay, and how to create your own delay line for under fifteen dollars.

Manufacturers put a sync generator on a chip in virtually all devices. Most of these sync generators allow adjustment for correct timing. Manufacturers usually allow minimal horizontal adjustment, and for subcarrier (color phase), the adjustments always allow for the full 360 degree adjustment. There are some devices that don't allow these adjustments. An Amiga with a Super Gen is an example. There is a natural delay in the video passing through the Super Gen. Measuring this on a vectorscope, we determined that our Super Gen (and presumably most) delays the video 42 degrees. The result? Purple people. Just using the Super Gen you would never see this, but using the Super Gen as part of a system, for instance, a Toaster in a second Amiga, or other switcher, it shows up big time!

We took the output of a TBC, ran it into input number one of a Toaster. We then took a second output of the same TBC, ran it into the input of the Super Gen connected to our Amiga 500P, then ran the ouput of the Super Gen into the second input of the Toaster. This gave us the ability to use programs like DPaint III keyed over the TBC and manipulate it in the Toaster. To compensate for the 42 degree delay caused by the Super Gen, we calculated how much coax would be needed to add to input number one of the Toaster so it had an equal delay. Now this may sound complicated, but the formula is quite easy.

The delay caused by the coax is approximately two degrees per foot. In other words, to delay the video into input one of the Toaster required twenty-one extra feet of coax between the TBC and input one. Let me emphasis the word "extra". We used a total of ten feet of coax in our run from the TBC to the Super Gen and from the Super Gen to the Toaster input number two. We also must use ten feet of coax for our run from the TBC to the Toaster input one, PLUS the twenty-one foot delay line. The result—Purple People are gone, and its cost? Fifteen bucks. Considerably less than the $800 commercial delay box.

Here's some helpful hints in calculating your own delay lines. If you have a vectorscope in your system, it's fairly easy to calculate the delays. No vectorscope? A little more difficult, but not impossible. In this case, rely on flesh tones to speak to you. Now, bars will work better IF you are using a scope, but it is easier to SEE color differences on flesh tones if you are relying on a color monitor, and then maybe fine tune the color difference with bars. Ok? A real pretty purple flesh tone, is about 90 degrees later than true flesh color. Blue, is about 180 degrees. Green, is about 170 degrees. Always cut your lines longer than you think you need them to be, because it's a lot easier to make them shorter than it is to make them longer. Example: If your people appear very purple, and you assume it is 90 degrees late, rather than cut a 45 foot delay line, cut one about 60 feet long. How close did you come? Are the flesh tones still a little purple? Then start chunking a foot or two off at a time until the flesh tones match. Also, use screw-on connectors, they are re-usable.

Hint Number Two: For delay lines of under 100 feet, I use RE-59 coax. For lines longer than 100 feet, I use a double-insulated coax. RG-59 will have some loss in it, but it is negligible under 100 feet and the double-insulated stuff is real expensive.

Hint Number Three: Use your head about where to put the delay line in the system. Before you determine something is "early" or "late", figure out what it is that caused it. Example: Had we put a delay line on the SuperGen (and it would have had to have been 159 feet long to bring the color back around) our colors would have been correct—but, because what we did is further delay the picture running through the SuperGen, it would now be horizontally incorrect (shifted slightly to the right). The Super Gen caused the delay, so the compensation has to be on the OTHER INPUT.

I hope this will help save some of you money, and also help some to understand some variations in configurating the Amiga with other equipment.

Sincerely,
Ken Smith
Winter Garden, Florida

As both AVID and its readership continue to grow, this column also experiences metamorphoses. We have expanded it so that the topics it covers are both more numerous, and at the same time as up-to-the-minute as possible. Remember, this column was created to give you, the *AVID* reader, a place to send hints, tips, gripes and news of interest to Amiga video obsessives, beginners to professionals. To continue to serve you, we also need to know if you have any burning Amiga software/hardware/techno-process questions. What we can't answer off-hand, we will research and uncover. So pick up that pen or phone and get involved in the hottest Amiga video magazine around! You may send your items of interest to:

R. Shamms Mortier
15 Rockydale
Bristol, VT 05443
(802) 453-4293 or
(802) 656-1953
For FAX suited persons,
the number is
802-656-0786

DCCG

Last month, we ran an article concerning a reader's plea for her disabled child and other children in an organization called the Disabled Children's Computer Group. I received three letters asking for more general information about organization, so I thought it would be good (for those of you also interested who didn't write, and for Amiga Good Samaritans in general) to give you a brief rundown of this organization's makeup and objectives. Certainly interested Amiga users would be welcome to contact the DCCG directly and offer assistance.

The DCCG is an interactive center that allows adults and children to test and experiment with computer hardware and software, and is a resource for families learning to interface with the technological tools with the needs of the visually, hearing, orthopedically or developmentally impaired. They use talking software (and I'm sure Amiga programmers working in this area would be welcome), scanning programs, touch screens and other devices that allow impaired individuals access to computer work and play. They also offer training seminars and consulting services to teachers, designers and vendors. Although the person writing for this assistance last issue was refering to her son's Amiga computer, Commodore is conspicuously absent from the list of donor companies. This might change with a little letter writing. Considering the multimedia magic of our favorite system, wouldn't it be nice to see it represented in a major way for humanitarian purposes? Amiga vendors and users also could get into the act by donating unwanted hardware and software. Here's the DCCG's address:

Disabled Children's
Computer Group
2095 Rose St., 1st Floor East
Berkeley, CA 94709
(415) 841-DCCG

WHAT? A MISTAKE?!

Yes, even Ph.D.s are known to err... in truth, most times at a higher rate than the general population. Last issue we told you about a demo disk of one of the nicest sets of 24-bit and HAM texture mapping libraries around, images from Robert Young being marketed for a mere $7 a disk. It seems that we gave the wrong P.O. box number, so here's his address again: Robert Young, P.O. Box 167, Whittier, CA 90608.

Another missed piece of information from the last issue concerns the train picture included as a graphic for the Matt Strauss interview. That picture was codesigned by two Matts — Matt Strauss *and* Matt Harter.

BACKDROP PLACES

One of the nicest video backdrop looks is to generate your scrolling titles over a scenic digital painting. Two prime Amiga programs that are able to do this are Vista*pro* from Virtual Reality Laboratories and Scene Animator from Natural Graphics. Each can load and render database information from the U.S. Geological Survey (USGS) and both produce spectacular results. We will look at both

in more detail in an upcoming issue of *AVID*, but just as a teaser, here are some of the databased places that Vista*pro* allows you to tap into for full digitized, overscanned scenic graphics and (yes!) IFF animations: Mt. Baldy; Lake Arrowhead; San Gorgonio; Big Sur; Simi Valley set; Los Angeles set; Orange County (Calif.) set; Inland Empire set; San Diego set; Jackson Hole (Wyo.) set; Flaming Gorge (Wyo.) set...and on and on, 26 sets so far! Natural Graphics sets add more for the Scene Animator program. These should be great for weather stations as well, providing both animation databases and pictures that various weather patterns can be demonstrated against. I have used both programs with Draw4D-Pro from ADSPEC Programming as backdrops for strange animated sequences. Imagine wrapping one of these scenic beauties around your next 3-D sculpture. By the way, Virtual Reality Labs also markets a program called Distant Suns (now in version 4.0), that allows Amiga video folks to create spectacular and accurate astronomical sky backdrops as well, and a list of alternate databases is also available.

Virtual Reality Laboratories, Inc.
2341 Ganador Ct.
San Luis Obispo, CA 93401
(805) 545-8515
Natural Graphics
4603 Slate Cout
Rocklin, CA 95677
(916) 624-1436

The AFVF

I would like to highly recommend that any Amiga video person investigate becoming a member of the American Independent Video/Filmmaker's Association (AFVF). It costs about $35 a year, and is worth every penny, especially if you have aspirations concerning entering the professional film or video industry (and show me an Amiga video obsessive equipped with Toaster, expanded RAM, video recorders, etc. who has no such desire!). One benefit is the magazine *The Independent*, published 10 times a year. This publication has articles of interest on filmmaking, technical hints for video users, a ton of ads on editing and post-production houses. It also lists grant information for independents from time to time. Another nice reward for members is a fat booklist of very important topics, the kind of information that can turn your Amiga investment in the direction of a professional, profitable venture. For information, write:

Foundation for
Independent Video and Film
625 Broadway, 9th Floor
New York, NY 10012

The VIDCELL Digitizer

For those *AVID* readers interested in building their own digitizing unit at a minimal cost comes the VIDCELL digitizer from GT Devices (P.O. Box 2098, Pasco, WA 99301). For about $80, you can purchase a kit that will let you build an 89 bit (256 color) video digitizer, and the kit includes the software to run it. Plans are in the works by the same com-

pany to let you build a true 24-bit (16,000,000) unit in the future. This is a "slow scan" unit, which takes a full 10.6 seconds to capture a 640 x 400 video frame (times three: once each for the RGB guns), so freeze framing is needed at the input end. This is not a project for those inexperienced with reading schematics and using soldering irons, so the novice is not advised to do this. The promo package comes with a 9-pin printer printout of an image captured with this hardware. This might be just the ticket to while away those long winter nights, and have a reward at the end.

Never Enough!

There is truly never enough economical storage available to the Amiga artist and animator, especially when it comes to 24-bit imagery (which we are seeing more and more of), we often find that our floppies and hard drives are bulging at the seams. For that reason, I though you might be interested in yet another unit that hopes to help the Amiga video artist attain a measure of satisfaction and relief.

The unit is called the INSITE "Floptical" disk drive, and it is being marketed by Digital Micronics (5674 El Camino Real, Suite P, Carlsbad, CA 92008, (619) 931-8554). Release should be soon, but no price is available yet (probably around $500 plus or minus). The drive acts like a SCSI hard drive when it is loaded with 20-megabyte diskettes, and like a normal Amiga drive when loaded with traditional DS/DD or DS/HD disks. The 20-megabyte diskette tracks are true optical media, and not magnetic, making them fairly invulnerable to accidental erasure and magnetic defects. It's supposed to be a more trustworthy solution than the more common replaceable media drives and less costly all around. I intend to purchase one in the near future, and will let you know the blissful or torturous outcome. Stay tuned.

Almost OCR

Migraph, Inc. (200 S. 333rd St., Suite 220, Federal Way, WA 98003, (206) 838-4702), makers of the Amiga hand scanners, is about to introduce a real OCR (Optical Character Recognition) reader. You may never have heard of such a device before, but OCRs can make data entry a breeze. Often, it is necessary to re-enter by hand text from type-written copy into a word processing program. OCR readers do this automatically by scanning the page and interpreting the alpha-numeric symbols on it, converting them to digital data. In case you think this is of little interest to Amiga video people, think again. This could be of immense help in transferring script data to a desktop publishing program for storyboarding purposes. The Amiga future just keeps getting fatter.

DCTV

DCTV owners will love the 1.1 upgrade for DCTV Paint. Among my favorite additions are the Undo feature and the new Spiral fill. Having an undo is vital in electronic painting, and this one is flawless. The spiral feature allows you to create some of the most beautiful pinwheel effects that I've seen in any medium. If you choose your colors with care, allowing adjacent palette selections in the gradient fill bar to be interspersed with the background color at several points, it is easy to create the effect of a pinwheel star floating in space. The graphic is simple in design, yet just perfect for titling and credit effects. DCTV Paint is starting to pull ahead of the pack in the high-end paint programs because of ease of use and initial cost factor in purchasing the unit itself. What will this paint program look like a year from now!?

On another matter, it's rumored that there will be a DCTV/CDTV connection real soon. Will DCTV be bundled with the CDTV unit? Will it be built in? Only the inner sanctum secret caverns of Commodore and Digital Creations know for sure, but the air is heavy with speculation and anticipation. It makes great sense when you think of it. I often have gotten the two acronyms confused anyway, so why not take advantage of the synchronicity of the language? Besides, it's a great selling point and marketing idea for both Commodore and Digital Creations, and a nice benefit for purchasers (especially those that are already Amiga users) of CDTV as well. DCTV yet may become a true standard on the Amiga, since it is moving quickly in that direction.

A New Palette to Paint With

Folks who upgrade to DPaint IV may be a bit bewildered at first by the palette requester. It has a totally new look and feel, as well as sporting some brand new capacitiies. The Keyboard "p" still brings up the palette, but it has a totally different appearance than the DPaint III version. The first area that offers new creative opportunities is the "mixing" zone, where you can actually mix colors in an intuitive fashion. This area, in fact, has the same feel as its counterpart in DCTV Paint. When you achieve a color you like, it can be copied to a palette color pot. The palette requester works differently for HAM as opposed to non-HAM modes. In non-HAM, you can create a full 256 colors, but you are limited by the mode as far as use. For example, a 16 color Hi-Res screen still only can contain 16 colors in all. You can use the extra ranges, however, to work up colors that you might like to substitute for the standard 16.

HAM mode allows the full use of all of the colors. A selector at the bottom of the palette color area in the toolbox allows you to move through the ranges from a to p, 16 ranges of 16 colors each (16 x 16 = 256). The greatest thing about this is that by altering a color in the HAM palette(i.e., the first range) you change its global representation on the screen, an attribute not normally resident in other Amiga HAM paint programs. Because DPaint IV is HAM animation compatible, you can also import all of those nice paintings you did with NewTek's DigiPaint software and animate the heck out of them, altering their palette colors on the fly. Although experienced DPaint III users will take about two or three hours to learn to manipulate the DPaint IV palette requester well, the creative options it offers, especially in HAM, are of great benefit to Amiga artists and animators.

MichTron News

The news from MichTron (3201 Drummond Plaza, Newark, DE 19711, 302-454-7946) is multileveled. First, owners of the AMAS sound digitizing

unit are in for both a hardware and a software upgrade, and both will be major. One new feature on the hardware will be a volume control on the box. The software will feature new tools for filtering sounds, as well as a host of special effects. Users wishing to have a new hardware unit will be offered the upgrade at a special price, and will not be asked to trade in the old units. Software upgrades will be offered at a minimal cost to previous users. The AMAS unit (about $200 brand new), by the way, is a very interesting tool for taking advantage of the Amiga's sound capabilities. It is both a sound digitizer and a complete MIDI interface at the same time. MichTron is also marketing a new lower end digitizer called Stereo-Master (about $80). Their Personal Finance Manager package will be upgraded to PFM-plus at the end of October. The VIVA multimedia software that Michtron markets has a new valuable partner—CASA. CASA allows you to develop an application in VIVA and then it writes the C source code for that application for various uses. Neat, huh? And, oh yes, one last item. By the end of September 1992, MichTron will be marketing my book called *Amiga Desktop Videography*, which has taken about two years to prepare and revise.

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Avid Column!

Still More Toaster Tricks!

Creating Text in CG for Use in ToasterPaint

Many users would like to be able to title right over framestore images from within the Toaster. Unfortunately, this capability is still ahead of us, in the promised 2.0 release. Until then, what to do?

Although the following steps may seem to be "the long way around," they will get you there, allowing you to create and place CG-generated text onto freeze frames or other graphics. This maintains the integrity and "sharpness" of ToasterCG, with the terrific framebuffer images that the Toaster can grab and display. The best of both worlds.

1. Enter ToasterCG.
2. Select a Framestore Page (F1, then F4).
3. Select Background Colors (alt-F3).
4. If the Background Color button (F2) is set to be a gradation of color, press it to change it to one solid color.
5. Set the color value of the background to be white (r255, g255, b255).

Why white? Because this framestore page will be taken into ToasterPaint, and the text cut out as a brush (to be placed on the destination image). ToasterPaint functions from the RGB interface as a HAM paint program, and is unable to display true color on the Amiga monitor. You want a background color that is not dithered on this interface in any way, since you need a solid color background to pick up the text from it cleanly. Otherwise, you will cut out lots of other-colored pixels when you cut out the text brush.

6. Select the text, outline and shadow attributes you want (F3).

(Note that the semi-transparent shadow doesn't work successfullly for this tutorial. The background color is used to help determine the shadow color, and this shade of color will tag along when you cut out the brush. For this purpose, use either no shadow or a solid shadow.)

7. Enter your text. It doesn't matter where you place it on screen for now.
8. Render the image to the Preview buffer (F9).
9. Exit CG.
10. At the Switcher interface, select the framebuffer that contains the rendered image on the Preview Bus. Save this image to your framestore.
11. Enter ToasterPaint.
12. Load the saved CG framestore.
13. Go to the Palette Menu (or press F3).
14. Select the Pick Color button (or press the comma key).
15. Move your cursor onto the screen, and click anywhere on the white background color that fills most of the image. This selects it from the screen, and makes it the active color.
16. Hold down the right mouse button to access the menus. Go to the Palette Menu, highlight the Copy Color command and let go of the button. The cursor will become an arrow with a question mark.
17. With this new cursor, hold down the right mouse button and go to the Brush menu. Highlight the No Background option and let go of the right button. You will not see anything happen, really, except that your cursor will return to normal.

You have just instructed ToasterPaint to treat the active color (in this case,

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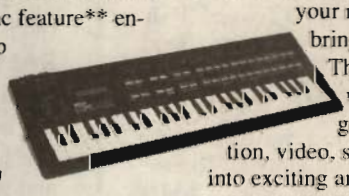

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white) as the background color for your next brush operations. Further, you've told it that you do not want this color to be a involved in the operation. You can do this with any solid-color background, actually. I find pure white to be the easiest, since I never use r255 g255 b255 for text (it usually appears too hot to use on screen). Any color that will not dither is acceptable for this trick.

18. Go to the Tools section. Select the rectangle tool.
19. Select the scissors tool.
20. Drag out a box surrounding your text.
21. When you next move the cursor, you will find that your text brush has been copied, cleanly lifted off from the background white.
22. At this point, you may jump to the spare screen (press j), load the image that this text is destined for, and render test to see where it works best. One nice feature of ToasterPaint is that you may place the text on the image, render it to a buffer to see if it works and Undo it if it doesn't. In this way, you can find the perfect placement without having to re-load the image and re-cut the brush time-after-time.

Note that on a Toaster with only 5 (and sometimes even 7) megabytes of RAM, you may not have enough memory to utilize a spare screen. In such cases, cut out the brushes and save them (as brushes). Then load the intended image and work on it with one brush at a time.

You also can attempt to load the GetSmall Project from the Preferences menu. This project contains none of the Toaster Digital Effects, and saves roughly one-half megabyte of valuable chip RAM. It may be enough to allow you to work with the spare screen.

Brush trouble? If, when you cut out the text brush, you get bits and pieces of other colors with it, then the background color is not solid, but dithered. To check this, press the comma key (Pick color), move the mouse onto the screen and hold the left button down while you move around the screen. Watch the color value indicators. If they shift around from 255 to 245 to 253, for example, then the background is not a solid 255 for all three color guns. Go back to CG and doublecheck your background color settings. It is likely that one of them is not correct.

Miscellaneous Toaster Stuff

This may seem "old hat" to seasoned Toaster users. But it's worth pointing out. The Toaster uses every button on the keyboard for a different function. To differentiate between the numerical keys across the top of the keyboard, and the ones bunched on the right side of the keyboard, NewTek defines the group on the right "numeric keypad" (or just "the keypad"). The rest of the keyboard is simply "the keyboard."

Similarly, the Return Key and the Enter Key are two different beasts as well. Watch out for these two! The Enter Key shares the numerical keypad, down there on the right, while the Return Key is a little to the right of dead center on the whole keyboard. They do not perform the same function!

The keypad is vital for CG Page and Frame Store operations (when you are at the Switcher). The top four symbol keys select different functions, the plus and minus keys scroll among the selections, the number keys can be used to make a selection directly and the Enter key performs the operation.

Speaking of Preferences, did you know...

You can save, re-name and delete Projects from the Preferences screen, just as you can save, re-name and delete frames from the Switcher Screen? Although the manual doesn't say so, it's a feature that the Toaster supports. The two panels operate in the same manner.

On the Switcher Screen, the Save Frame button serves three functions: Save, Re-name and Delete Frames.

- To save a frame: select the Save Frame button, enter a three-digit number from the keypad, then hit Return followed by Enter.
- To re-name a frame: select the Save Frame button, enter the 3-digit number of the frame (or use the plus and minus keys until you find it), click the mouse in the text window, type in a new name, press Return, then hold down the

right Amiga key and press Enter. A box will appear, asking you to confirm the request. Click Yes or No as you prefer.

• To delete a frame: select the Save Frame button, enter the three-digit number of the frame (or use the plus and minus keys until you find it), then hold the right Alt key and press Enter. A box will appear, asking you to confirm the request. Click Yes or No as you prefer.

On the Preferences Screen, these same keystrokes work within the Project Control Panel, when the Save Project button is depressed.

Another shortcut when using both of these file menus: you can click the mouse over the three-digit indicator window and, while holding down the button, drag up or down to scroll through the available files. This works with all operations for Projects (on the Preferences screen), and frame stores, CG pages and digital effects (on the Switcher Screen).

Yet another shortcut: After using the mouse to select the file with the numeric indicator, just double-click on the appropriate function button to perform the operation. This is the equivalent of pressing the enter key. For example, with the Load Frame button pressed, you locate the file number you wish to load, then double-click the Load Frame button to load it. It saves taking your hand from the mouse, which can save production time. *P.S. Yaa... another shortcut. Use the "f" key on the keyboard to capture frames of video. The "f" key toggles the freeze button on and off. Even better, hold down the right Alt key and press "f" when you have a frame that needs motion removal processing. Alt f is the equivalent of going to the Preferences Screen and clicking on the motion removal button.*

We Get Letters...

Burt Wilson of Simi Valley, Cailf., slapped my hand (and rightly so) for an incomplete tutorial recently. (You mean there are people reading this?) He pointed out a missing tutorial step in converting a 2-D logo into a 3-D object: after converting the original image from 24-bit RGB to 1-bit black and white in ADPro, save the image before quitting! The tutorial skipped this vital point.

Also another lesson discussed keying CG text with drop shadow and outline using the luminance keyer. It neglected, however, to instruct you to set the keyer to key on black before setting the clop level to 50. Good eye, Burt! Thanks for taking the time to let me (and others) know.

ChromaF/X is a misunderstood section of the Toaster. Blame for this should be shared between the manual and the interface, I believe. Neither is particularly informative. Unlike the Switcher, where you can pretty much look at it and figure it out, ChromaF/CX appears daunting and cryptic.

So here goes. ChromaF/X 101, in a nutshell, for those of you who cut class (or left your book at home).

ChromaF/X creates color filters that may be applied to any of the Toaster's four video inputs. It cannot be applied to a still frame because it requires both framebuffers to perform a ChromaF/X effect (one for the digital channel, one for the filter). ChromaF/X applies color to the image based on the image's brightness levels.

The majority of the ChromaF/X screen is taken up by the big color editing control panel near the middle, and the color mapping controls at the lower left. The color map is the square box on the lower panel. On the RGB screen, it appears black. On the preview output, it appears in color. This is due to the Amiga's inability to show the 16-million color palette. Since the Preview output is NTSC video, it displays the palette.

Take the video image and divide it into horizontal (left to right) strips, one atop another, to fill the screen. Each strip represents the full range of brightness on that part of the screen (ignoring the color value). This is the color map. From top to bottom it represents the screen image. From left to right it represents the luminance (brightness values) of each strip.

In a given strip, suppose you wish to replace the darkest, blackest parts of the strip with color. ChromaF/X gives you the tools to replace colors on the screen with colors from your filter, using the brightness value of the original colors as the gauge for measurement.

Because the screen is divided into horizontal strips, you have greater con-

trol over the colorizing effect. Take, for example, a scene of a couple on the beach. It was shot in the late afternoon, with the sun going down. The sky is full of clouds, but they're heavy and dark and the sunset is pretty unspectacular. Romantic, it wasn't.

With ChromaF/X you can add color to the scene, placing a more orange wash over the sun and clouds, blending that into a faint violet glow on the beach and rocks at the bottom of the scene. An orange-to-violet (top to bottom) color map will achieve this.

Load ChromaF/X and go to effect 31, Sunset Filter, to see how this is done. This filter, from top to bottom, is orange to violet. From left to right, however, it is black to orange (at the top) blending into black to violet (at the bottom). How do you "read" this filter?

At the top of the color map (therefore, the top of the screen) the darker parts of the video image will retain their original coloring. Blacks remain black. But the lighter parts of the image will begin to be tinted with an orange wash.

At the bottom of the color map (the bottom of the screen) the darker parts of the video image still retain their original coloring. The lighter portions of the image, however, will begin to be tinted with a violet wash. Since the color map blends the orange to purple gradation seamlessly, the orange sky will blend in a correspondingly smooth manner down to the violet rocks into the final video footage.

The next question is, how would you make this filter? For the following discussion, I will not use the ChromaF/X terminology. Doing so would require reproducing images of entire interface for ChromaF/x, button for button. I'm going to keep it simpler, because it is a simple program, really.

If you are still at the ChromaF/X screen with the Sunset Filter, take a look at the middle panel. There is a strip of color running across it. This strip can represent either the top line or the bottom line of the color map (and, therefore, of the picture). (Select top or bottom by clicking on the tiny arrow buttons beside the top or bottom of the color map.) By clicking anywhere within this strip and adjusting the RGB/HSV sliders to green, you are saying to the Toaster "On all parts of the screen at this specific brightness level, I want a green tint." If you spread this green from the left end of the strip to the right, you are saying "Tint the whole screen green, across all brightness levels."

Just beneath the color strip are three sets of buttons. The two on the left automatically set black-to-white spreads on the color strip (left to right, or vice versa). The four in the middle choose different kinds of spreads between the colors that you indicate (on the strip pick a color, pick a spread button, then on the strip pick another color). The two buttons on the right, with a single and double arrow, are Copy and Swap functions (pick a color on the strip, pick a function, then click elsewhere on the strip).

Once you have defined the horizontal left-to-right spreads for the top and

bottom lines of the color map, you then select a vertical top-to-bottom spread to go between the top and bottom lines. The vertical spread buttons are on the lower panel, beside the color map. This is how to achieve the smooth orange-to-violet spread that creates the Sunset filter. Other buttons here provide you with other types of spreads.

Lightwave 3D Miscellany

Have you had difficulty with the Play Frames button in Lightwave? Many users say they can render and save frames just fine, but when they go to view them with this function, Lightwave says "Frame not found" or "is not correct version." Take heart. You probably didn't know about the requirements for Play Frames. Here's what happens.

Part I

When you render a 120-frame animation named Frank with Save Frames active, Lightwave will save Frank001, Frank002, Frank003, etc. When you go to use Play Frames, Lightwave expects you to direct it to the files it needs. But Lightwave only wants to prefix for the frames, not the numbers. So, when you click on Frank001, make sure you click on the file name itself and then delete the 001 suffix. Lightwave only wants to be told "Frank." However, this information is not enough. Lightwave still will give you an error message when you hit OK.

Part II

Lightwave needs to know which frames to play. In the Scene menu there are buttons for First Frame and Last Frame. (You use these to instruct the Layout menu how many wireframe preview frames to render when testing an animation.) You also use these for Play Frames. For the 120-frame Frank animation, these would need to be set to First Frame 1 and Last Frame 120. Now go to Play Frames and select the Frank prefix. Play Frames will work.

In this manner, you can play a specific set of frames, say from 40 to 80 only. You need not play the entire batch if you don't wish to.

Beware Full Size Save

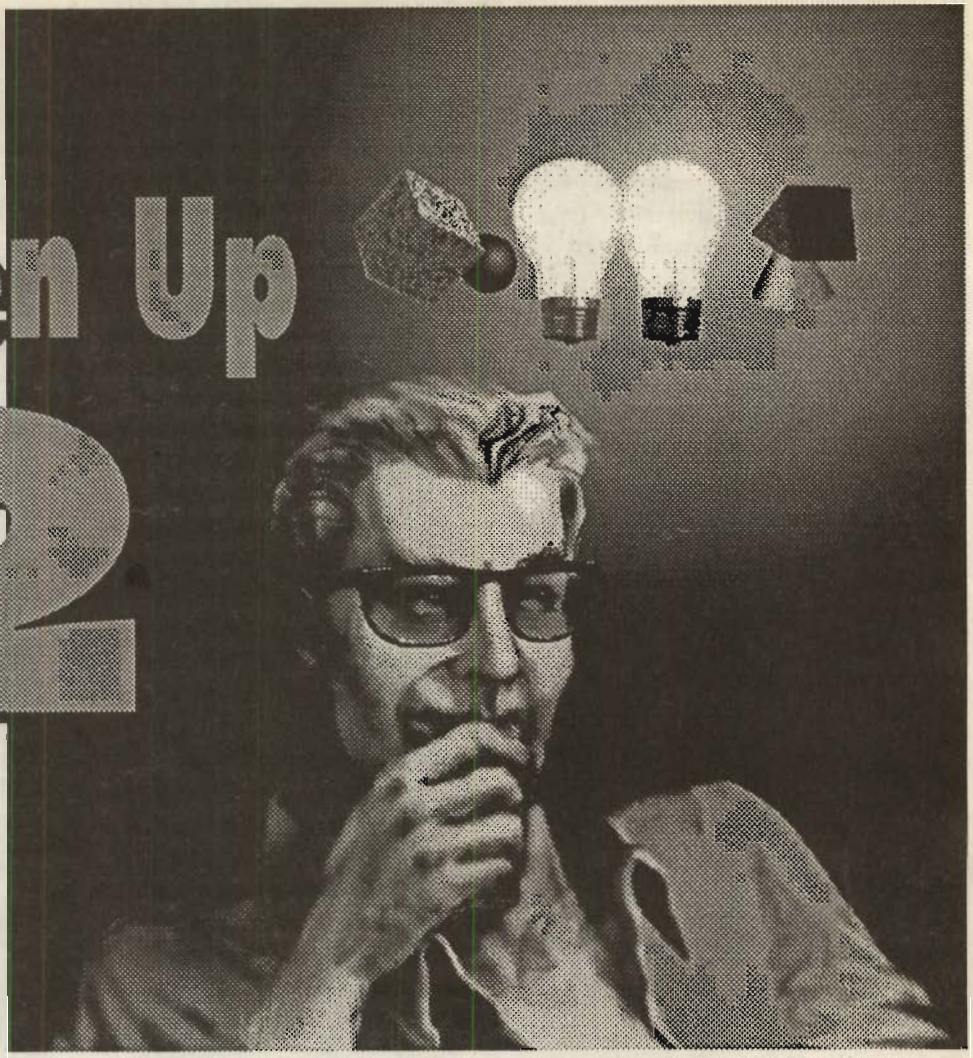
This is a dangerous button. People have been known to endure days-long renderings only to discover the Full Size Save was not what they should have done. This button is used in conjunction with Save Images, which saves RGB files after they have been rendered.

Full Size Save will save an oversized 24-bit RGB image that is too large to load into ToasterPaint. Machines I have checked may crash attempting to load such an image. If they don't, they only load a partial image, the upper left corner (736 x 480 out of 1560 x 960) in a chunky lo-resolution appearance. Obviously, this is intended for output to some other devices, such as film recorders or print devices. Therefore, if you're intending to work with an image further in ToasterPaint, leave Full Size Save off.

[Editor's Note: James Hebert has taken a position with NewTek. This is his final contribution to Toaster Tricks. His departure is a major loss to AVID Magazine, but a great gain for NewTek. Good Luck James!]

Avid Feature!

Lighten Up #2



Have you ever noticed that many computer-generated 3-D images just don't look right? Somehow it's obvious that the objects are not in the real world? In this installment of Lighten Up, we're going to explore a few ways to overcome part of this problem. To do this, we're going to cover Textures!

Textures, in the industry sense of the word, are usually a frozen image of a real world object, such as a brick wall. In the Toaster world, this usually involves taking a good video camera to the surface you wish to capture, setting up lights very carefully, shooting some footage, then using the Toaster's FreezeFrame to grab it. At present, the next step is to take it into a 24-bit paint package such as ASDG's Art Department Pro (not ToasterPaint, as you'll understand shortly) and "tweak" the image.

"Tweaking" may include adjusting shading and so on, but the primary tweak at the moment is to eliminate "The Zipper." For those of you who don't know, when the Toaster grabs a frame it doesn't stretch all the way to the top and sides of the available space. If you have ever tried to wrap a frame which you grabbed on your Toaster, you've probably noticed that if the wrap involves multiple copies of the image, there is a black space between each of them. Welcome to the Zipper. You can't fix it in ToasterPaint, because TPaint suffers from the same malady. This is a double-plus-bad thing. NewTek has promised up one side and down the other that the next release of the Toaster software will eliminate the Zipper, but for now this is the way it is.

What this all boils down to is this: Making your own textures can be a real hassle. But here's the good news--you don't have to! There are a number of companies around that are making textures you can buy and use in your stills and animations. The best I've located for Lightwave are from Texture City. Texture City is composed of a group of video production people who decided that they couldn't wait for someone else to do this, so they did. Lucky for all of us, they chose to share their hard work with the rest of us (and, I'm sure, make a few bucks in the process). They currently have hundreds and hundreds of textures, and have packaged the best of these into three

bundles.

TC's Pro Textures bundle is a set of 50 images for $299.95 If you think this price is high, you should probably know that equivalent textures for other systems often run two to three times that amount. Plus, this set used to consist of only 30 images, but the people at TC decided they could afford to increase it to 50 for the same price. If you already own the 30 set, you should be hearing from TC soon and you will receive the extra 20 free of charge.

Anyway, this bundle includes many beautiful textures, such as various colors of granites and marbles, rocks, woods and scenic images. A few of my favorites include pebbles, brick wall, gravel and sparkles (which seems to be the glint off of water in direct sunlight, slightly out of focus). This last one didn't seem useful to me when I first looked at it, but can really produce some striking effects when used properly.

The greatest thing about textures such as these is that there are no rules to their usage. Pebbles, for example, can be suface mapped, and they look like pebbles. But try using the image as a bump map, with a white surface color and voila! You've created a stucco wall! Scribbles (which seems to be exactly what it is), makes a passable frosted glass when used as a transparency map. You would be amazed at all of the things you can make from just a few textures.

Texture City also offers two smaller packs, Pro-15#1 and Pro-15#2, at $179.95 each. These sets were originally released as 10-packs, but TC has upped them to 15. The same guidelines for the extra textures apply as above if you purchased one of the 10 packs. While there are fewer textures in these sets than the larger one, they are just as useful as the bigger bundle. Set 1 offers exciting textures such as cracked mud, beads and copper. You'll also find a variety of marble and wood textures, as well as a cobra pattern. This set offers a nice mix for the beginner, or someone who just doesn't want to invest a whole lot of money. Set 2 offers a broader range of a select few textures. You'll find many excellent marbles, woods and rocks on this set. If you need "fancy" textures, this is the set for you. By the way, there are no duplicates of any textures among the three current sets. This means you can buy all three sets and have 90 completely different textures! Also, each set includes compilation screens, in HAM (4096 color mode), with four images in the set per screen. This is an excellent way to find quickly and exactly the texture you want, when you have a lot of them from which to choose.

The first question I had when trying to use these overscan textures is this: What size is a full-screen image in a 3-D world? After guessing randomly, I discovered I needed to go about it in a more scientific way. Going into Modeler, I created a 4-meter-by-4-meter square, then mapped an image with obvious tiling onto it with a 1 x 1 x 1 texture size. When rendered, I could see that there were three full copies of the image horizontally, three vertically and half images all the way around. I re-created the experiment with a 2-meter-by-2-meter square. This time I found that there was one full image in the center surrounded by half images. I tried one more experiment, this time with a 1-meter-by-1-meter square. At last I had found the exact size of a 736 x 480 texture! Why is he telling me this you may be asking. Well, suppose you want just a certain portion of a texture to appear on a surface. You could use this technique with the Texture Center feature to find the exact placement. See, it wasn't a waste of reading time after all.

You may have noticed that I mentioned using "an image with obvious tiling" above. To explain this better, we need another example. Imagine you're using a marble texture with a prominent swirl in it. Now imagine that you need this texture (which is 1 meter square, remember) to cover a surface which is 2 meters square. You either could use the Texture Size option to make one image 2 meters square (which, by the way, would be a size of 4 meters on the X, Y and Z, get it? Two squared!), or you could allow Lightwave to "tile" the default size. Using the Texture Size method you end up with a large, possibly boring, square of marble, but it looks right. If you use the tiling method, you get fairly obvious

repetitions of the single image. How can you possibly overcome this? It relies upon the image being what is known as "seamless." This means that the left side and the right side, when put next to each other, seem to form a continuous design. This is the same with the top and bottom. The problem is that this is not always possible with "real-world" textures. Having more light on one side of an image than the other can ruin the seam, as can having a complex design.

A few of the textures from Texture City (3215 Overland Ave., #6167, Los Angeles, CA 90034, 213-836-9224) can pass as seamless, but many cannot. I spoke with Larry Rosen and Steven Blaize at TC about this, and they were quick to admit this is true. They are, however, working to improve the situation, and promise that they will try to keep the "real-worldness" of the images intact. All in all, I find that they are very capable folks (and downright pleasant to talk with), so I'm sure they'll pull it off.

Let's cover one more thing about these (and any other 24-bit textures, I might add). They are not for the faint of memory or hard drive space! Textures run from around 800K up to just over one megabyte, and the Pro bundle consumes more than 45 megabytes of hard-drive space! I've come to realize that 1,500K (or 1.5 megs) is just about the minimum memory remaining you can have and still safely render an image. I can get four of the textures loaded on my nine megabyte system (using the Get Small Project) before I am at 1,600K remaining. This doesn't leave me with a lot of room for objects, since none have been loaded yet, but it should be obvious that 24-bit textures must be used sparingly. Remember the tricks mentioned above though? If you need to have a pebble texture and a wall texture, you can use the same image for both, just with different surface settings, and so on. For those of you interested, each set comes on a BIG stack of floppies, and you need to have the hard-drive back-up program "QuarterBack" from Central Coast to decompress them onto your hard drive. If you are a serious Lightwave user, I recommend these textures very highly! The prices stated are list price, and you should be able to find the sets for much less at a retailer near you. You can't even begin to imagine how much better they will make your results look and, after all, isn't that why we do what we do?

WARNING! TUTORIAL AHEAD!

All right, enough about other products, let's play with Lightwave a bit. In my travels in the Toaster circles, I find one subject is a major stopping point with people: How to build good looking 3-D objects from scratch. My first statement is that it really isn't as hard as most people make it. You would be surprised at how in just a short amount of time you can produce some fine results. In this example, we'll make a respectable looking Roman pillar. "Oh, that's real tough," some of you may be saying, "just generate a cylinder!" Well, we're going to go a step further. I suggest you make yourself comfortable in front of your Toaster, maybe grab a soda or a snack, and follow along. Presuming you have no major difficulty in following along, this shouldn't take more than 30 minutes (the tutorial looks much longer than it is, trust me). Of course, after you get the hang of it, you can whip one of these out in about two minutes. (Note that this object will not be to scale, but is simply to teach you some exciting and useful techniques.)

The first thing to do, of course, is to enter Lightwave's Modeler. I'm going to assume you already know how to do that, but if you don't you can refer to your Toaster manual because I don't want to eat up space explaining it. One thing I will point out, however, is that it is always best to use the "Get Small" project when working with Lightwave. This is done by going into the Toaster Preferences screen, clicking on the numbers beneath the word Project, typing 001 on your keypad and pressing Enter, which is also on the keypad. This will get rid of all of the Switcher effects (except fade and cut), and any other pre-loaded slices, leaving all available memory to Lightwave. Remember, it is always better to have too much memory available rather than not enough!

Now we should be in the Modeler, looking at a blank template. To get the basic feel of our pillar, we'll generate the cylinder. Simply click on the Objects button along the top of the screen (hereafter referred to as the menu bar), then Disc. We'll do as much of this as possible using the Numeric entry options so that all of you end up with the same results, so click the button marked Numeric. (Again, I'm going to presume you have already read the Modeler manual, so I won't explain what all these requesters are.)

Tell this window that the disc will have 18 segments, the bottom will be at 0, and the top at 8. Since a pillar is vertical, it will be along the Y axis. Set all three of the Centers to 0, and all of the Radii to 1. (Actually, since we are making the pillar on the Y axis, the Y radius will be ignored, but I go ahead and do it anyway.) When you have all of this entered, click OK and then Make from the buttons on the left. The cylinder now will be visible on your tri-view screen. Click on the line along the bottom edge of the screen to get rid of the Description Box, then press the "a" key on your keyboard to center the object in the three views. If you like, you can go ahead and save this object, then render it in Lightwave. I'll wait...

Oh, you're ready to continue! Well, let's go! Place your pointer in the middle of the circle in the view labeled Bottom, and press the "g" key on your keyboard. This makes sure that the place where you had the pointer is centered in that view. Now do the same thing with the very top of the object in the view labeled Back. Next, choose the Display item from the menu bar and click In three times. You should now see much better the various polygons making up the circle in the Bottom view.

Click on Polygon under the word Select in the tools to the left, and drag your pointer over all of the polygons except the one facing directly toward the +Z and the one to the -Z. You should do this in the Bottom view, and should be selecting 18 polygons. When you have them marked, choose Cut. This leaves you with two polygons (on opposing sides of the pillar) and a few points. This time, choose Points from the Select area, and select the points that are not involved in

those two polygons. Again, do this in the Bottom view. You should have 28 points selected. When you've got that right, choose Cut again. This leaves you with just the two polygons and the points that describe them. If you lost one or both of your polygons, click UnDo. If that doesn't bring them back, start over.

Now select the Volume mode from Select and draw a box around the two upper points in the Bottom view. Don't worry about the other views until I tell you to. When you've got those two points enclosed, click Copy and go to layer two by clicking the second little square on the top in the uper right corner of the screen; choose Paste. You now have just one piece of the pillar on this layer. What we will do now is a little bit of "carving" on it. Once more, click on the line along the bottom of the screen to release the box (from now on I will call this procedure Releasing).

Choose Copy again, and go to layer three (the third little square along the top--you get the idea). Paste your copy on this layer, then choose layer two as a background. This is done by clicking on the second little square in the second row along the top. From now on, I'll assume you know how to manipulate the layers.

Click on Modify, then Size, then Numeric. Set the factor to .8, so it won't be too much smaller. Set the Y center to 4 (halfway up our 8 meter pillar, right?) and the Z center to -1 (the distance from the true center that this polygon stands. If you don't set these centers to relate to the object you are sizing, you'll find the resized polygon "moved" to another part of the screen. When this is all set, click OK. You'll notice that our active polygon (which is white) has now shrunk a bit in relation to our original polygon (which is black). You are following this, right?

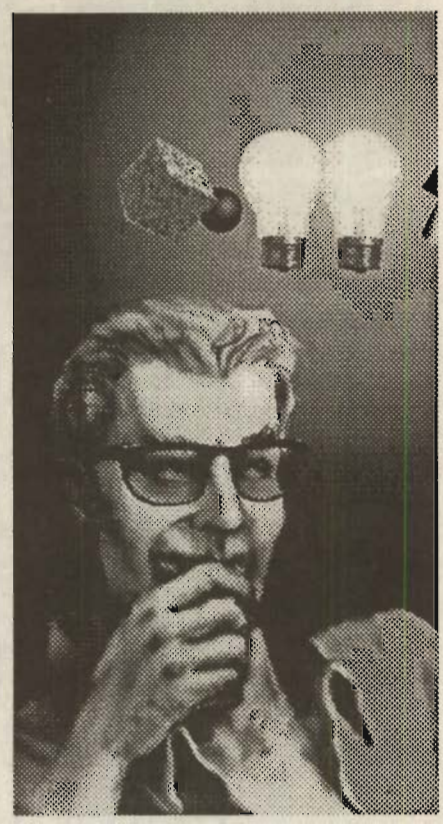
Now, choose Modify and Move and Numeric. Set Z to .1 (which will move the smaller polygon toward the center 100 millimeter) and click OK. You should see that it has scooted to the right just a little bit in the Left view. Go back to layer two and use the Polygon Select to select the single polygon there, and choose cut (you may have to use the Release operation described above to make this work.

This leaves you with four points. Hold down the Shift key and make layers two and three the foreground layers (both the shrunken polygon and the four solo points should be white). Choose Copy and go to layer four, then choose Paste. You should now have a total of eight points and one polygon on this layer.

OK, here comes the manual stuff. Click Point select mode. In the view labeled Back, choose the top four points in a clockwise order, then press the "p" key on your keyboard. (Make sure that you do this in a clockwise order or the polygons will face the wrong way. Also, be careful not to have more than four points per polygon. You may want to zoom in on the object to make sure you select the correct points.) This will define a polygon connecting those four points. Release your points and do the same for the four right-most points, then the four bottom points and finally, the four left-most points. You should now have a total of five polygons. See what we've done? We made an indentation in this panel of the pillar. Now comes the fun part!

Make layer one the background layer so you can see what we're accomplishing in this next step. Choose Multiply, Clone and Numeric. Now we have to make duplicates of this panel so that every other panel on the pillar has an indentation. Here's the math: A full circle is 360 degrees. Divide 360 by the number of panels we started with (18) and you get 20. If you clone this panel with a 20-degree rotation around Y, every panel would have the indent. We don't want that, however, we want it on every other panel. So, we only want half of the total number of panels. If we only have nine panels to create, then we double the degrees between rotations. Hence, we want to clone this panel nine times, with a 40-degree rotation around Y. Got that? If not, go back through and read it slowly. This is not terribly complex, and it is very important to understand! When you have it figured out, and the numbers are set in the requestor, click OK, and then Make. See how that worked? We now have each panel with a blank space on either side. Those blank spaces will now be filled with the unindented panel.

Go back to layer one. Click the Volume select and describe a box around the upper two points in the Bottom view. (Yes, these are the same points you started out with!) Cut those points. What we



have left is the panel that was on the opposing side of the pillar. Release your volume box and choose Clone, then Numeric. Since this polygon is on the same pillar as our last cloned one, we don't need to change the settings, just click OK, then Make.

Good! Now, with shift, make both layer one and four foreground layers. Choose Copy, go to layer five and Paste. Now the ring of indented panels and the ring of flat panels are on the same layer. Choose Points select mode, then Options from the menu bar, and finally Merge. This will get rid of all the duplicated points that would make ugly seams if we left them in there. You should be told that 48 points were eliminated from layer five. Guess what? It's done! Go ahead and save it. When you load it into Lightwave, the surface will, of course, be named default. Go ahead and render it (preferably in AntiAlias).

This tutorial wasn't meant to create "the most astounding object ever," but merely to teach you a few new techniques. The most important part of the tutorial comes next -- experiment with this method on your own. Here are a few suggestions:

1) Make the indent a sharper square. (Hint: follow the instructions, but pull the top points of the smaller polygon up higher, and the bottom points lower.)
2) Make the indent circular at the top and bottom. (Hint: Three-point polygons are the way to go with this one.)
3) Make a "ring" around the center of the pillar. (Hint: You'll need two shrunken polygons here.)
4) Try using various textures on the pillar. If you have any of the Texture City textures, it looks even better. Make sure to set the Texture Center to Y=4, and a Texture Size of 10 on X, Y and Z looks nice in most cases. Of course, these should be Cylindrical Mapped along the Y axis--more on that next month.

The image accompanying this article was created using these hints and tips, plus a little experimentation. As you can see, there are some real possibilities for unusual objects such as the pillar! I'll be the first to admit that this is probably not the easiest or quickest method to produce this object, but like I said a moment ago, it is to teach techniques. If you come up with shortcuts, feel free to send them to me. Describe in detail how you came up with the new approach, and send me a copy of the final result, if possible. You just may see your name in lights--well, ink!

That's about it...I've eaten up about as much of this months' AVID as Jim will let me (wink), so here comes the endgame: If you have comments, hints, tips, suggestions, products you would like to see covered, questions or anything of the sort, let me know! I can be reached at:

2421 E. Ball Road #B100
Anaheim, CA 92806
or on GEnie at address: D.Hopkins9.

See you next month, and may your life always morph!

Aid Column!

Beginning Imagine

Part III

In the first installment of this series we began an in-depth discussion of Imagine's interface, starting with the Project editor. We stopped at the Picture and Pixel Sizes section of the Parameters for Rendering Subproject requester, so let's resume from there.

The next section of the requester is the Presets gadget. If you click on it you're presented with a series of sub-requesters that let you choose any of the preset picture and pixel sizes contained in the Imagine.config file, such as HAM 320 x 200 or Lo-Res overscan. If you're using an unmodified version of that file, there should be 16 presets; three each for HAM, Interlaced HAM, Lo-Res and Res, and four for Impulse's Firecracker 24-bit video board. You can modify, add or remove presets by editing the Imagine.config file with a text editor. For example, if you want a super-fast, small HAM rendering mode, add this line near the end of the file:

```
PSET HAM-Tiny, 80, 50, 6,
7, HAM
```

The next time you run Imagine you'll notice a new preset named HAM-Tiny, and if you choose it you'll render 80 x 50 pixel HAM images, at 1/16th of the normal full-screen non-interlaced HAM picture size. If you use non-standard image sizes often, taking the time to customize the presets in the Imagine.config file you will save lots of time in the long run.

Moving downward in the Rendering Subproject requester we come to a text field called Path for Stills. Imagine fills

this in for you using the pix drawer in the current project's directory. This drawer is created automatically when you start a new subproject, and bears the name of the subproject appended with ".pix" (e.g. MySubproject1.pix). You can change this path to any other on your system. If you're working on a floppy-based system and have sufficient extra memory, rendering images to the RAM Disk may significantly shorten rendering times. Hint: to clear the field quickly, click in it and press Right Amiga-X.

Next you have five choices for the rendered images' File Format, of which only one can be active at a time. The program defaults to RGBN, which is Impulse's proprietary 12-bit format, which isn't compatible with many other programs. Click in the box next to ILBM-12bit to render in the Amiga standard HAM IFF format. These pictures are compatible with most Amiga graphics programs, such as Deuxe Paint IV and ShowMaker. The next choice is RGB8, Impulse's proprietary 24-bit format, again not too compatible. Next is ILBM-24bit format, again not too compatible. Next is ILBM-24bit, which is the Amiga standard 24-bit IFF format used by Toaster Paint, DCTV Paint and other 24-bit Amiga graphics programs. Last is the setting Separate R,G,B, (eight bits/file), which generates the 24-bit format originally used by Byte-by-Byte's Sculpt series of 3-D programs. This is an uncompressed format that produces three files per rendered picture, with red, green and blue image data stored separately. Since files don't contain size data, you must remember the image dimensions to properly reconstruct the image. If you use Art Department Professional, use the Sculpt loader to access these files. Better yet, don't mess with them if you don't need to; it's not worth the trouble.

The Amiga Viewmodes section lets you choose any or all of the three settings, HAM, Hi-Res and Lace for the Amiga graphics mode used when Imagine displays a rendered image. This is done using the Show command from the Project editor's interface. These are usually set for you in the Presets. In general, you would use either HAM or Hi-Res if you're using a picture width of 320 or 640, respectively, with or without Lace. To set a combination of these as part of a preset in the Imagine.config file, separate them with a vertical bar character, the shifted slash key:

```
PSETL  a  c  e  d
HAM,320,400,12,7,HAM/LACE
```

The next section, Path for Movie, lets you change the directory that contains animations generated by Imagine. As with Path for Stills, it defaults to the current subproject Pix directory, but you can change it to another directory at any time. If you change the path for stills or movies after rendering either, existing stills and animations are lost.

The File Format referred to in the requester's bottom-most setting is that used when you click on the Make button in the Project Editor screen's lower right corner, after selecting a range of frames. If you use the default Imagine setting, the program generates an animation in a proprietary format that only can be loaded and played back with Imagine. These animation can't be used by other Amiga programs, nor can they be edited. They consist of a sequence of files rather than a single file, so if you copy an Imagine animation to another disk make sure you get all the files. For successful playback you should copy the entire project. If necessary, first delete rendered stills to save disk space.

The alternative animation file format is the Amiga standard IFF ANIM format, also called Anim-5. When you render an Anim animation, Imagine asks you if you want to use the same palette in every frame. Even if you say Yes, however, the program changes the palette on every frame. Fortunately, most Amiga multimedia software can handle such animations. HAM animations rendered by Imagine in either format can be very impressive looking.

When you generate an animation in Imagine, one of the requesters that pops up asks you if you want to delete frames. Unless you're extremely short on disk space, I recommend against it. If an interruption occurs, and with the length of time required by ray tracing one often does, and most of the frames rendered

have been deleted, they'll all have to be rendered again. In other words, if you save frames and an interruption occurs, you won't have to start over from scratch.

Continuing in the Project editor interface, we come to the Open gadget, used to load existing subprojects. The Delete Subproject gadget doesn't seem to do anything. Use the Modify gadget to change the current subproject's parameters. Changing most of these settings will cause existing rendered frames to become inactive, effectively deleting the frames, although the picture files remain.

A bit lower down in the Project editor interface we find the Stills section, presided over by a horizontal slider and a display of frame numbers. If the current project uses more than 70 frames you can scroll the display to any section using standard slider techniques. You can click with the mouse to select any individual frame for subsequent operations, and by holding down the Shift key you can select additional frames. If you click in a blank area to the side of the frame numbers, all frames are de-selected. Also, you can de-select selected frames by shift-clicking on them.

You're probably familiar with the Generate, Show and Delete gadgets. Use the Range gadget to select more than a few frames. You must use the keyboard with the Range requester. The first number is the start frame, the second number is the end frame and the third number is the frame increment. Use two or three as the third number to render every other or every third frame for a quick test of your animations, which is very important before the time-consuming final rendering.

The Info gadget gives you useful information for selected frames. You're shown the picture file name, file size, date and time of creation and time required for rendering. This last statistic is stored with the picture file and is available at any time.

The import gadget is used when you want to trick Imagine into thinking it has already rendered a frame or frames for the purpose of rendering an animation from an existing sequence of frames. You must provide the existing files in the current subproject's format and named pic.0001, etc., placing them in the subproject's .pix drawer. Select the corresponding frames, then use the Import command and respond Yes to the requester. Then use the Make command to generate an animation.

If you're repeatedly rendering the same frame while experimenting with different effects, click on the box next to Generate New Cells Only to turn off the default setting so that you needn't first delete the frame every time. If you then generate an animation, however, make sure you turn this back on again to avoid having to re-render the first two frames at the end of the animation.

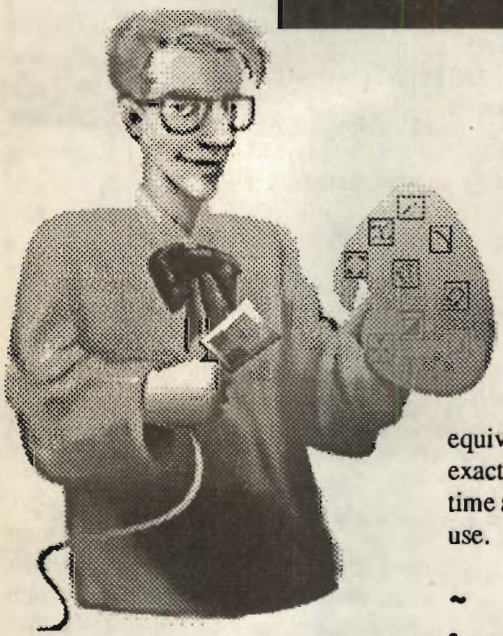
If you render in 24-bit mode, click in the box next to Auto Dither before using the Show gadget to get a better approximation of the rendered image. If you use Firecracker24, click in the box next to Use Firecracker24 to render directly to Impulse's 24-bit RGB display board. I don't think this feature has been implemented yet.

Finally, we come to the Movie-related gadgets, most of which are self-explanatory. Normally, to make an animation you select a range of frames, then click on the rightmost Make gadget. After the animation is rendered, you click on the Load gadget, then on Play Once or Play Loop. In my experience there's no difference between the two. To free the memory used by the loaded animation, click on Drop. The Edit gadget takes you into AmigaDOS's Ed text editor. You can set up complex animation sequences with existing frames using Imagine's script language.

In the next installment we'll start looking at the Detail editor in depth. Until then, please write with your questions and comments in care of AVID.

Tutorial!

Doug's Deluxe Paint IV Tips



In this column, I'll explain the latest tricks, techniques, and tips to help you create the most professional results possible using Deluxe Paint. I'll reveal how some of the Amiga's premier artists use Deluxe Paint IV to create their work. Bug reports, work arounds and utilities will be covered as well. Although most of these techniques will be for Deluxe Paint IV specifically, some of the material covered will be able to be used with Deluxe Paint III, and even Deluxe Paint II.

DPaint IV Quick Tips

Key-Cuts:

Anyone who wants to be proficient with DPaint IV must learn the keyboard equivalents. Every keyboard shortcut is exactly that: a shortcut. They take less time and, therefore, are more efficient to use. Some keys to remember:

~	Make Stencil
.	One Point Brush
-/+	Brush Larger/Smaller
,	Pick Color
ctrl-r	Ranges
b	Brush

Shade Ranges

Under Deluxe Paint III, the shade mode was an invaluable tool for making bevel-edged brushes, soft-edge shadows, marble effects and air-brush effects. But under Deluxe Paint IV, the shade tool can be a nightmare. A nightmare that, with proper knowledge of how DPIV works, can be cured. Deluxe Paint's shade tool has always relied on palette Range settings, but under DPIV, ranges have been significantly re-designed. There are now two types of ranges: continuous and non-continuous. Non-continuous ranges have empty slots in the range requester (example: white on one end and black on the other, with no colors in between). Continuous ranges have all spaces between the beginning color and the ending color filled (example: color white on one side, Black on the other, and the slots between the two filled with incrementing grays). The problem lies with the fact that the shade command requires continuous ranges to work correctly. Otherwise, when you use the shade mode, you'll get some colors to shade darker to lighter, while others will not shade at all. Simple fix: make all shade ranges continuous. Problem: It's very difficult and time consuming to make a continuous range over a lot of colors! To help you with those problems, use the bracket keys ([and]) to move up and down your palette and fill the range requester quickly.

Watercolor Method and Mix

While using DPaint IV, I came to the conclusion that the color mixing area was useless. It seems no matter what color you want to mix, it ends up looking like mud. This color mixer seems to be mixing oil paints together, where paint colors get contaminated easily. The following technique, the watercolor mix, gives you the light, pastel quality of watercolor to mix your colors with, but there are some drawbacks:

1) The watercolor method requires you to be in HAM mode.
2) The watercolor mix requires a por-

tion of a spare page (this can be part of a picture, the swap page or a frame of an animation).

This technique really feels like painting with watercolor. If you like the pastel quality of a fine watercolor, you can use this method to create complete pictures with excellent results. Your brush will seem to run out of paint, and you'll find it produces much softer, almost translucent colors.

To Set Up Deluxe Paint IV for Watercolor Painting:

1) Call up the palette mixer (this step is optional).
2) Set the background color to white. This white must be one of your first 16 "base" colors.
3) Clear the screen (press Shift-K)
4) Set the background color to a dark neutral (like black) by clicking on the dark palette color using the right mouse button.

The first four steps set your background color to a dark neutral color, while giving you a white screen to paint on.

5) Choose a base color to paint with (using either the palette RGB/HSV sliders, the PICK command or just choosing a register). For this example, use a color from R-12, G-3, B-4.
6) Set the mode to Color by Pressing F2.
7) Choose the dotted freehand tool ("s" on the keyboard). Choose a circular brush at a size that paints rapidly on your system. Hand paint a small square of color on the page. Each side of the freehand square should be about the length of the word "Deluxe" in the title bar. This swatch of paint is your base color. Think of this as watercolor concentrate on the side of your mixing palette. To mix colors using the watercolor mix:
8) Select Mix from the mode menu.
9) Paint your freehand brush, starting in your square of color and moving off the edge into the white. Keep going. If all your settings are correct, your paint should dissipate into light gray. If you have troubles, make sure all your settings are correct. Remember, your page should be white, but your actual background color should be set to black.
10) Create a new swatch of a different color by pressing F2 for color. Make sure that there is at least 20 pixels of white in between each swatch. To get back to Mix Mode use this little tip: the "a" key on the keyboard activates the last menu selected again. By using the keyboard equivalent for color, it leaves the last menu selected as mix. As long as you don't use the pulldowns, you can use the "a" key as a shortcut to mix.
11) Mix each swatch of color together by painting between the two swatches in Mix mode, use the "from", swatch's color as the brush color. For example, if you have red and blue swatches, mix from the red to blue using a red color brush, and from the blue to red using a blue colored brush. When you do, you should get lots of shades of color, usually a lot lighter than the original two shades.

To Paint Using a Watercolor Effect:

a) Perform the preparation steps above.
b) Select Mix Mode from the Mix pull down.
c) Paint, starting in white with your color. The beginning color your brush starts with should be about twice as light as the actual brush color. As you drag your brush, the paint should run out, slowly fading to a light gray. This light gray looks like the slightly tinted water a real watercolor brush leaves when the pigment runs out. The lighter the color you start with, the faster your brush runs out.
d) Release the mouse button to "refill" your brush.

Why It Works

Deluxe Paint IV's Mix Mode lets the user mix colors together, but there's one exception to the rule: foreground colors won't mix with the background color. That's the trick to my watercolor method. The key is to have your background color not set to white, but have your entire screen filled with white. Even though you see the white screen as your background color, Deluxe Paint will treat the white as another foreground color, and therefore allow you to mix the current color with it. Tricky, huh?

Big Deluxe Brushes

The Big Deluxe Brush technique allows you to have a bigger than screen brush. This is invaluable when creating an animation that, say, pans over a large scene, etc. Big Deluxe Brushes require a lot of chip memory to work correctly, so use at least a 1 megabyte Agnus. You can get away with a 512K Agnus in some modes, but probably not animation. To make a Big Deluxe Brush, just draw the actual brush image in a page that's larger than the screen. For example, create a page that is 640 x 200, using the Page Size...Menu option, in a 320 x 200 size screen. Now, draw a side profile of a train. When you reach the edge of the screen, scroll over a little more using the arrow keys. When you've reached the end of the page, you should have a train that's about 640 pixels long. Save this as a picture.

Now that you have your Big Deluxe Brush drawn, you need to be able to use it in an animation. Like a train going across the screen. Set the page size to 320 x 200, and create a track, background, etc. for the animation. Now to load your Big Deluxe Brush, go into the Deluxe Paint Brush loader and load the train picture you saved as a brush. Voila! Your Big Deluxe Brush. You want it transparent? Well, the change transparency option doesn't work, but here's a way to work around it.

Enter the palette mode. Exchange the color you want transparent with another color that's not in your brush. Select the Brush. Re-map from the color menu. Your Big Deluxe Brush now has a transparent color. For the final step, exchange your two colors in your palette.

Your brush is now ready for the animation. Don't try to use any modifiers on your brush, like + and - or size or flip. You may get away with it, but chances are you'll lock up the system.

That's it for this time. I hope you enjoy using Deluxe Paint IV as much as I have. If you have any questions or comments feel free to write me in care of AVID.

First Look: The First Amiga Digital Solution for Audio in Video

One of the most complicated, time-consuming, cable-ridden, error-prone and frustrating parts of putting together a competent video is production of the soundtrack. The small studio and advanced consumer/prosumer must confront several serious problems before a video soundtrack is complete; and the typical video consumer finds these problems so daunting that, more often than not, the soundtrack is the part of a family video that never quite gets finished.

Picture degradation is a major problem inherent in editing audio for video. Picture quality degrades from one tape generation to the next. For most purposes, even with S-video, three generations is the practical limit that can be made without time-base correction before distortion caused by tape instabilities begins to upset the viewing audience. This means you can select scenes and edit the original footage (first-generation) onto the master videotape (second generation), which is then ready to be copied to another generation (third) along with a completed soundtrack. Certain new edit decks and camcorders have PCM (Pulse Code Modulation) sound capability in addition to the usual hi-fidelity and monaural analog sound. Pulse Code Modulation is a form of digital sound modulation, and allows hi-fidelity digital sound to be dubbed onto the master videotape without erasing the picture, greatly reducing the tape generation problem.

Many edit decks have an audio-dubbing capability allowing audio to be dubbed (copied) onto any generation of videotape. Called "edge dubbing" because the audio is recorded linearly along an edge of the videotape, the dubbed sound is distinctly low fidelity and of little to no use when a quality video soundtrack is required; but the low fidelity audio track can be used to carry SMPTE time code. A number of pieces of video equipment use it for this, the Sony EV9700 being just one.

With the exception of PCM hi-fidelity sound, hi-fidelity sound is always recorded with the picture, necessitating a generation of videotape to be used for laying down an edited soundtrack. Using only one generation of tape to lay down the sound means bringing all the sound together in one place at one time to copy the soundtrack together with the master video onto a blank videotape. This is quite difficult without a full SMPTE studio set-up, and almost impossible without at least a second set of hands.

Suppose, for example, you have sound effects on a CD, music on a cassette, the original background sound on videotape has been dumped to a reel-to-reel deck and you also want to spot dub narration live. And you want to do all this at one time so that audio will "waste" only a single generation of videotape.

The best way presently to do this is to dump each audio source to a multi-track tape recorder in a preliminary mix, use time code for the final mix and dump the time-coded sound to the third generation of videotape, synching the audio to the time-code striped videotape.

For those studios with SMPTE time-code capability, production of a soundtrack can be a leisurely activity. Each track can be created separately and recorded on a tape deck. The various tracks then can be accurately cued and mixed, and the videographer can be sure that the soundtrack will match the edited video. All the videographer needs to do is make sure the numbers on the videotape match the time code numbers on the tape. To create hi-fidelity sound, however, that third generation of videotape is almost always necessary.

If you do not have time-code generators and readers and a multi-track tape deck, however, you need to connect outputs from the CD, the cassette deck, the reel-to-reel and a microphone to a four-channel audio mixer, the output of which is connected to your recording edit deck. If any lip-synched sound from the original footage is necessary, you also can run the audio output from the videotape player through the mixer. Then, as you copy the master video, you must cue all audio sources, set levels, run fade-ins and outs and supply narration. These are a very complex series of tasks for a person with only one brain and two hands, and also fairly difficult to coordinate when more hands and brains are used.

By the time you read this, a small, Campbell, Calif., company may have started a second revolution in Amiga desktop video by shipping its all-in-one Amiga solution for audio in video. SunRize Industries has been involved in Amiga sound sampling from the beginning. SunRize is responsible for the Perfect Sound 3 digital sound sampler and the Audition 4 digital sound editor, so it has had much experience in Amiga digital audio. In the past, however, there have been very limited uses for Amiga sound in video. Why? Because sound on the Amiga has always been limited to a maximum sampling rate of 28,000 Hz and a resolution of eight bits.

Sampling rate refers to the number of times per second that the sound sampler "looks" at a sound to measure and record the height (or amplitude) of the waveform. An analog waveform would be a continuous line if drawn on graph paper . A digital sound sampler, such as SunRize's Perfect Sound 3, looks at an analog signal a specified number of times per second (28,000 times per second is called 28,000 Hz), and assigns each such "sample" a binary number based on the size of the waveform's amplitude at the sample. The sampler records this number. When the sample is to be played back, a circuit "demodulates" these numbers into an analog waveform sound.

How are analog sounds turned into numbers? A simplistic way to visualize the digital recording of a note by a sampler is to imagine a black, vertical line on a piece of paper. This line represents the

entire range of frequencies that the sampler will sample. A white dot on this line represents the note to be sampled. Let's sample the note at 15,000 Hz with a resolution of eight bits, or 256 intervals (two to the eighth power) from 0 to 255. When the sampler looks at the line, it decides if the dot is in the top half or the bottom half of the line. If the dot is in the top half, the sampler assigns a one for the first bit of the eight-bit binary number. If the dot is in the bottom half of the line, the sampler assigns a zero. Let's say the dot is in the top half. The first bit in the eight-bit binary number is a one.

The sampler then examines the top half of the line and assigns another one or zero, depending on whether the dot is in the top or bottom of that half. And so on until eight bits have been assigned. You can see that as more bits are assigned, the sampler approaches the position of the note more closely. If the resulting binary number is 11111111, we know that the dot was in the top half of the top half of the top half, etc. In other words, the dot (note) is somewhere in the interval at the top of the line (frequency range) representing 1/256th of the line's length. If the frequency range of 15,000 Hz is divided into 256 intervals with each interval approximately 60 Hz tall. The note (dot) is, therefore, somewhere in the range of 14,940 Hz through 15,000 Hz. Likewise, if the binary number is 00000000, we know that the note is in the bottom half of the bottom half, etc., or somewhere in the bottom 1/256th of the line's length, or 0 to 60 Hz. If the binary number is 01010101 (binary for 85), the note is approximately somewhere in the range of 4,920 Hz through 4,980 Hz. As you can see, the 60 Hz resolving power of an eight-bit sampler is limited. The human ear easily can discern a difference of 60 Hz.

The continuous analog waveform is therefore converted, on graph paper, into a broken set of points or lines when a graph is drawn as amplitude over time. When the digital sound is played back, the discrete jumps from one sample to the next and are smoothed out somewhat by filters. The smaller the jumps from one sample to the next, the easier job the filters have in smoothing the sound.

In contrast to the Amiga's native eight bits, the resolution standard for compact disks is 16-bits, or 65,536 (two to the 16th power) intervals of sound. The minimum resolution thought necessary to please the most discriminating audiophile is somewhere around 14 bits, or 16,384 levels of sound. Since the competition for "most discriminating audiophile" is not over, this resolution figure is only approximate. For most video work, a resolution of 12 bits (4,096 intervals - 3.66 Hz tall intervals at a sampling frequency of 15,000 Hz) is generally considered acceptable.

The highest frequency of a sound to be sampled determines the minimum sampling frequency. The sampling frequency must be a minimum of twice the highest frequency of the sounds to be recorded, or else a form of distortion called "aliasing" appears. A sample rate of 28,000 Hz is therefore limited to recording sounds with frequencies below 14,000 Hz, which is well within the hearing range of a good, young set of ears; but not too awfully bad, since very little music exceeds 14,000 Hz. In general, an upper frequency of 15,000 Hz is considered not too limiting in recording hi-fidelity sound for video. Sounds on compact disks are sampled at 44,100 Hz. The upper frequency recordable on a compact disk without aliasing distortion is therefore 22,050 Hz (44,100 divided by two). Not too many ears can hear sounds above this frequency.

Each sample takes one byte of storage, regardless of the resolution. There is, therefore, no advantage in limiting digital resolution to save storage space, and every advantage in increasing resolution up to the limits of the human ear. Sample rates, however, do make a difference in the amount of storage necessary for sampled audio. Ten seconds of audio sampled at 28,000 Hz requires 280,000 bytes (28,000 bytes per second times 10 seconds = 280,000) of memory, or approximately 273K of memory (1,024 bytes = 1K, so 280,000 divided by 1,024 = 273.4375K). Compact-disk quality sound sampled at 44,100 Hz (44.1 kHz) for 10 seconds will require approximately 431K of memory. One hour of CD-quality audio requires approximately (1,024K = 1Megabyte) 151.4 megabytes of digital storage, as opposed to approximately 98.4 megabytes for sound sampled at 28,000 Hz. A typical music video of 3 minutes, 30 seconds with four channels recorded at CD-quality will require approximately 35 megabytes of storage capacity to modify, mix and dump it to videotape. It is clear that any computer solution to the problems inherent in editing audio for video will require large amounts of storage capability.

CD-quality sound is often not necessary in video. Music videos are the obvious exception, but sounds above 15,000 Hz are pretty rare, so a sampling rate of (15,000 x 2) 30,000 Hz (30 kHz) often is quite acceptable for video work. One hour of sound sampled at 30 kHz will require [(30,000 HzxX 3,600 seconds) divided by (1,024 x 1,024)] approximately 103 megabytes of storage. Another way of looking at it--a 110-megabyte hard drive will give you enough storage space for four separate 15-minute-long channels of audio to be mixed for video, as well as holding the system and audio software.

SunRize's solutions come in two flavors of hardware, and the software is the common denominator. Ready for release, and possibly shipping by the time you read this, is the AD1012 digital audio card for the Amiga. Two recent trips to SunRize's headquarters in the heart of Silicon Valley gave me a familiarity with some of the software; and on my second visit, I saw the first five production cards stacked in a row, ready to be tested to determine if a full production run should be ordered.

The heart of the AD1012 is an Analog Devices ADSP2105 digital signal processor (DSP), which runs at 10 MIPS, fast enough to digitally manipulate sound in real-time. The card comes with 64K of on-board RAM, and this can be increased to 256K, which will be necessary to take advantage of planned software revisions. The card has RCA jacks for input and output of analog sound signals,and an RCA jack for accepting SMPTE time code.

The AD1012 is a monophonic 12-bit card that allows recording to and play-

back from the Amiga's hard disk of 12-bit audio at user-definable sampling rates of up to 100,000 samples per second. Frequency response of the AD1012 is a very respectable 20 Hz to 20,000 Hz, so sampling above 40,000 Hz is a waste of storage. Since the user can set a sample rate low enough that aliasing distortion would be introduced either upon recording or playback, antialiasing input and output filters are provided so that input and output cut-off frequencies can be set at from 2.6 kHz to 33.3 kHz. If a channel of sound is sampled at 30 kHz, for example, it would be necessary to set the filters at 15 kHz to avoid recording or playing back any sounds that exceeded 15 kHz (30 kHz divided by two). Otherwise, any sounds exceeding 15 kHz would cause noticeable distortion. The filters are accessed as simple sliders and are set at the same time as the sampling frequency.

Studio 16 is modular software bundled with the AD1012, which allows the sound technician to cut, copy, paste and mix sampled digital sounds stored on the Amiga's hard disk, as well as to access SMPTE time code and make window dubs. Studio 16 includes several modules, including Edit, Mixer, CueList, Equalizer (scheduled for the first revision of the software), Open List (for samples), a clock, a Module Librarian (keeps track of loaded modules of software) and a SMPTE monitor.

The first version of the graphical mixer module allows up to four channels of sound to be concurrently played and mixed down to one channel. Alternately, three internal channels of sound can be mixed with one channel of input. SunRize plans to increase this to 16 channels in the first revision of the software. Each mixer is displayed on screen as either an analog or digital VU meter with accompanying slider, as well as a monitor (output) meter. For now, the mixer can access only one hard disk at a time, so all channels to be mixed must be stored on the same device. Additionally, the mixed sound cannot currently be recorded back onto the hard disk. It must be recorded on an analog device (tape recorder) and fed back through the computer for further changes. Software revision plans include the capability to access several hard disks at one time and a record-to-hard-disk feature. These two revisions will be necessary to take advantage of having more than one AD1012 card installed in your Amiga, such as for stereo output, for example.

Studio 16 presently is only capable of reading SMPTE time code. The CueList module allows the user to synchronize up to three channels of audio with time-code-striped videotape, with the software triggering audio events at user-determined time-code points on the videotape. In addition, the user can build cue lists without time-code input. On my second trip to SunRize, I saw four sound effects, each on a separate channel, cued about one-tenth of a second apart and then played from the hard disk simultaneously. This, of course, won't be as accurate when dumped to videotape as the use of time code because videotape stretches as it is played. So over long stretches of tape the digital sound will tend to play a little more quickly than the videotape. For short stretches of sound, however, this should be no problem.

The time code can be read and individual frames of video or audio can be located by means of the SMPTE Monitor module. This module, when opened, looks like a digital clock; but when the sound is playing the numbers whiz past in a blur. One of the advantages of the SMPTE monitor is that it can be genlocked over video to create "window dubs." Rough "off-line" editing then can be done on a copy of the master videotape; and the master videotape will be played a minimum, resulting in a smaller number of dropouts before the video is complete. Anthony Wood, president of SunRize Industries, assured me that the first revision of the software would include the capability of writing SMPTE time code (on a videotape's monaural audio track--the best use for the "edge dubbing" track) as a separate module. Will it cost extra as an option? "That depends on how many hours it takes to finish it," Wood said.

The Edit Module bears some resemblance to SunRize's Audition 4, eight-bit sound editing software, and features a graphical window containing a real-time waveform representation of the digital audio pulse code. Cutting and pasting ranges of sound is done via simple mouse clicks as in Audition 4, and the user can zoom in to examine particular areas of the sound. I spent the least amount of time with the Edit Module, since it had just been up and running.

Anthony Wood acknowledged the preliminary state of a couple of the software modules, and said that SunRize will ship the AD1012 before all the bugs are out of Studio 16. To rectify any complaints among initial purchasers, however, SunRize has established a policy of free software upgrades for one year, not to include periodic releases of new software modules. Additionally, the full purchase price of the AD1012 will be applied toward purchase of an AD1016 when it is released. The AD1012 with Studio 16 is available direct from SunRize for approximately $500. SunRize will offer phone line support.

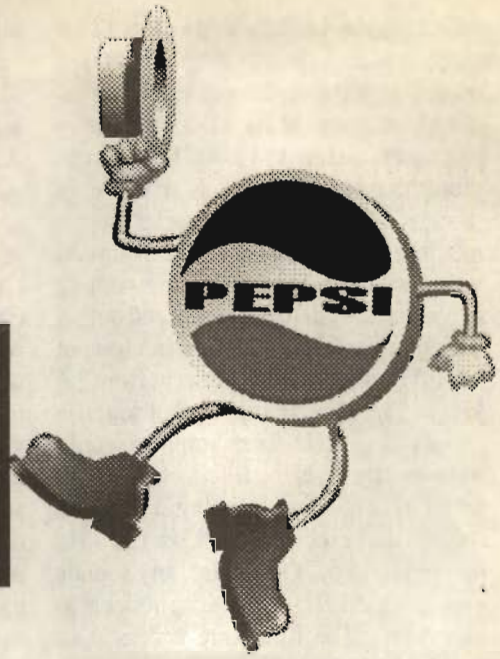
Did I say AD1016? Yes, the big stereo sister of the AD1012, with a faster Motorola DSP56001 DSP, and digital Input/Output ports so that data from CD or DAT can be digitally transferred, completely avoiding analog degradation of sound. Sixteen-bit resolution for CD quality and more onboard RAM and RAM buffers to handle the increased data load. The AD1016 will ship, hopefully, a few months from now, and you can place the phrase "Digitally Mastered in Stereo" on your videotapes for a price of about $2,000.

If you are interested in these products, SunRize Industries can be contacted at:

SunRize Industries
2959 S. Winchester Blvd.,
Suite 204
Campbell, CA 95008
Phone: (408) 374-4962

Aid Feature!

Animating LOGOS!



"The magic finger writes..." Sometimes a fairly simple approach to logo work can be the ticket to visual success. It is becoming rather tiresome to see the same logo flyups and flybys in every commercial. Added to that is the fact that the very design of some logos themselves does not respond well to zooming techniques and rotated twistings. As an example, logo lettering with the look of script, whether formal or loose, is not the type of design that generally likes to fly. It's rather like getting an actor all dressed up in formal wear and then inviting him to a beach party. It's the wrong look for the situation, or in this case, the wrong situation to enforce on the look.

There is a term widely used in instructional media that can act as a theoretical bridge to the process we'll work with in this article. The term is "progressive disclosure." Any information, especially if it's visual in nature, that is displayed a piece at a time is said to be "progressively disclosed." Many Amiga animation utility programs take advantage of this process and create wipe patterns that progressively disclose a screen, whether by falling "sheep" (the new Toaster software) or sprinkles of pixels spiraling in and out. Screens treated in this manner are given an air of mystery. Even an unexciting final image introduced like this goes through a moment when you don't know what will be the final outcome. Depending on the progressive disclosing technique used (and there are thousands), more formal images respond well to this method.

One method of progressive disclosure that works exceptionally well for formal logo lettering is "automatic writing." This is a method whereby the lettering seems to write itself on the screen. It has a history that was so successful that many movies (especially 1940 vintage melodramatic films) used it to generate opening screen titles. It is a tedious animation task to create automatic writing with traditional animation tools, and the time and patience it takes test the most dedicated animator. Though the computer method also takes a certain time and energy commitment, it can be accomplished on the Amiga with DPaint software.

The Assignment

This article is based on an actual job done for the local ABC affiliate here in Burlington, Vt. All of the work was generated and produced on an Amiga 2000 with the help of Electronic Arts' DPaint (Version 3 or 4) and a Canon black-and-white scanner. The logo came on a metal plate from Jason's Dry Cleaning in Burlington, and the plate was folded so it could not be digitized by standard means. The client wanted the logo, including all pertinent color information, to be duplicated in video, and also requested that it not fly up to the screen in any deformative manner.

The first step was to get a digital copy of the logo. This could have been done by hand-tracing it and then drawing over the tracing on a graphics tablet, but that was deemed too time consuming. It's always best to find the most time-conscious ways to produce the work for a client. Word gets around, and saving a client a few dollars is a way to advertise your conscientious nature as a designer, and to get you more work. The quickest way that I could think of to get a digital image on screen was to place the metal plate on a copier, and to take the output and scan it. Once the image was on screen (in High-Res), I was able both to clean it up, straighten out necessary lines and to colorize it according to the original. All of this was done in DPaint, in which the animation later would be handled. Because the logo itself was composed of a brush font for the main text, a minimal amount of "straightening up" was required. With the subhead "Dry Cleaning," it was quicker for me to replace that lettering than to try and straighten what was there. My favorite all-around bit-mapped font disk for general work is "Andre's Fonts," since it

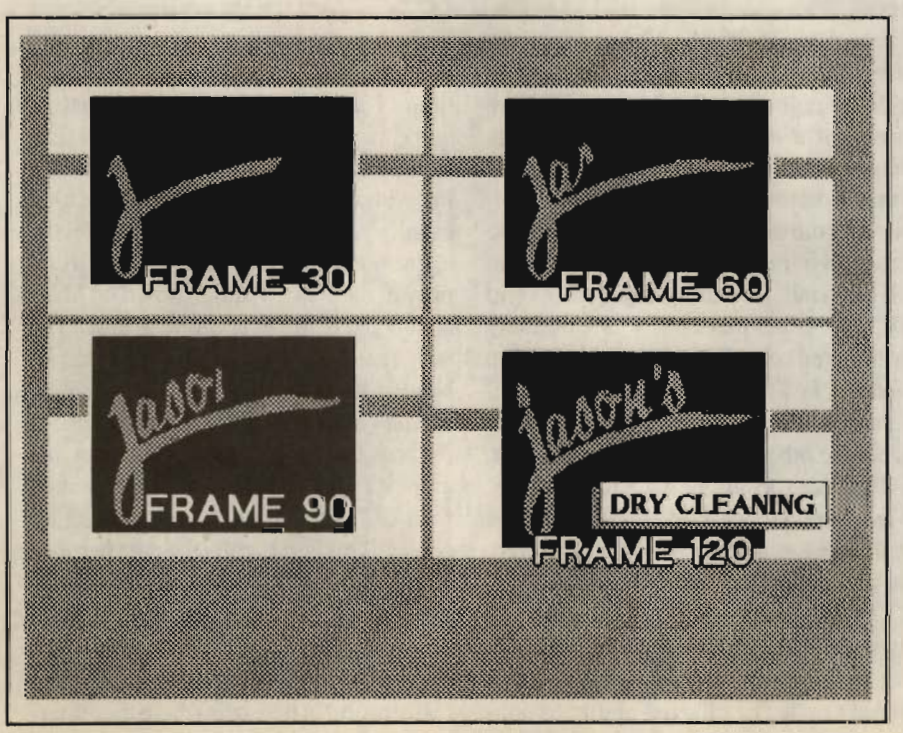
contains both Helvetica and Roman faces (check your local distributor or mail-order house if interested in availability and price of this package).

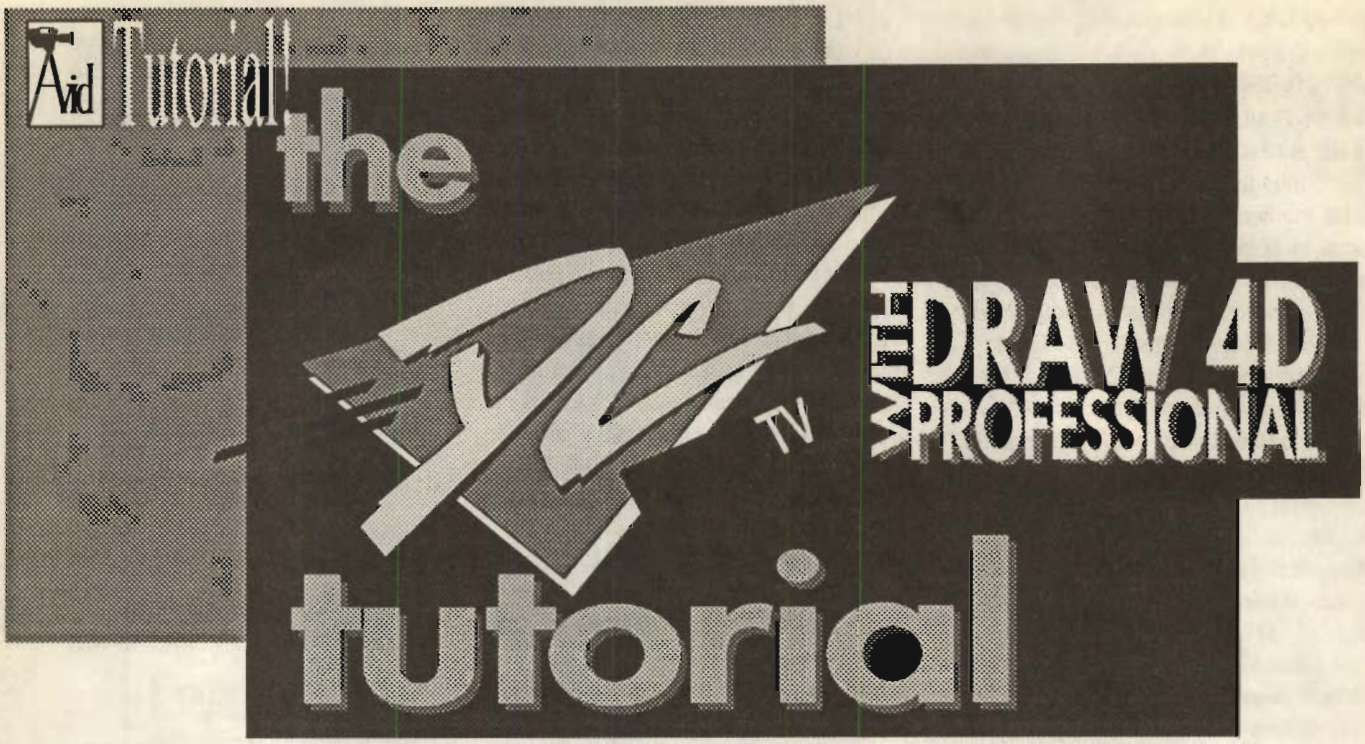
The Animation

I decided early on to have the main lettering write itself to the screen, and then to pop the subhead on later. To accomplish the first step, I created a very clean picture of the logo without the subhead, and copied that to 160 frames. I was only going to use 120 frames for the actual animation, but the extra frames would be used to give the editing situation something extra to avoid going to a no-signal situation too soon. It's always best to record extra frames at the beginning and/or end of your computer animations, just in case a few extra frames are needed for the final piece.

Once I had all of my frames down, I stencil-protected everything but the letter color. Then I grabbed a fairly fat brush, one that would cover the width of the letter strokes, and began to erase the lettering to the color of its background panel. I did this from the end of the piece toward the front, working my frames backward so I could see what I was doing. If DPaint IV had been available at the time, I could have used its "light table" function, allowing me to see through the frames to the previous one, and making my work easier. As it was, however, since this work was done with DPaint III, I had to continually check my work by flipping back and forth between the last frame worked on and the present one being manipulated. When you use this technique, moving by small increments will give you a smoother and slower animation, while using more radical jumps will make the lettering write faster and a little jumpier. I looked for a moderate in-between place since I was limited to the amount of time it would take place, and yet wanted a smooth as possible movement (see the accompanying figure for a sample of animation frames).

Once this was done to my satisfaction, I simply put the subhead in place so it appeared 20 frames from the end. The whole thing then remained in place on screen for a few extra seconds. One nice touch added was that I allowed the dot to be placed over the "i" at the last animated moment, sort of finalizing the animation. If you are an AVID subscriber, and want a copy of this animation on disk to study the process further, send $7 to: R. Shamms Mortier, 15 Rockydale, Bristol, VT 05443. If you're not an AVID subscriber (and why not!?), the cost will be $15. Enjoy! See you in ROMulan space.





Several years ago, after returning from a trip to South America, I was hired as a programmer's assistant on Kirkland Air Force Base in Albuquerque, New Mexico. I was just starting back to school at the time and appreciated the opportunity to work with computers. What was unusual was the fact that I could not program my way out of a wet paper bag! I had my first opportunity to learn when my boss came into my office and tossed a large stack of printout and a couple of floppies on my desk and asked me to perform certain modifications to a program. When I told him that I didn't know how to program, he simply laughed and said, "Here's your opportunity to learn." The modifications mainly involved graphics, and after a couple of long weeks I finished the job, and was totally hooked on graphics! Later, another of the staff purchased an Apple Lisa, which allowed me to jump up from creating graphics with typed commands to using a mouse. The third step in my evolution came when one of my coworkers, who knew that I really loved graphics, tossed a magazine on my desk one day. It was the premiere issue of Amiga World. After that, the rest is history. I now own my own Amiga 1000 with 2.5 megabytes of RAM, Digiview, genlock, midi interface, keyboard, camcorder, and an A3000 with six megabytes of RAM, 50 MB HD and a DCTV.

I now work at Omega Business Products in Albuquerque where we sell both IBM compatibles and Amigas. Through managing the Amiga side of the store, I have become very proficient with video, graphics and animation. I have seen a lot of video products for the Amiga (especially since the video/multimedia market drives most of our Amiga business) come and go. I think that the two most revolutionary devices for video to hit the Amiga are the Video Toaster and DCTV. I feel that DCTV is extremely underrated considering what it does! The Toaster is a wonderful product, but it functions best in an environment where there are other devices (cameras, VCRs, TBCs, etc.) to allow it to really shine. Many Amiga owners do not have all the equipment to make the Toaster completely do its thing. That leads us to DCTV.

I like DCTV because its ability to digitize video and re-display it in 24-bit color (or close enough to it where it doesn't matter). I like its ability to convert 24-bit files to native Amiga graphics modes. The DCTV paint package is by far the best on the Amiga! Last, but not least, DCTV's ability to play animations realtime in millions of colors makes it invaluable. At a cost of under $500, you can see why DCTV is the best imaging bargain on the market for any computer. DCTV is good for the person who has a limited budget, equipment or, like myself, just wants to do 2-D and 3-D animation. I do a lot of graphics/animation work for a local cable TV and independent video producers. I hate video editing with a passion (I have no patience). I usually just create the animations, let the client preview them, then with their approval haul my Amiga down to their studio and dump everything to tape. The only real drawback to DCTV is that its bandwidth is generally less than would normally be considered acceptable for the broadcast professional. However, the graphics and animation I have created with DCTV have held up very well on copies. This is generally the case because after working with different video people, I've learned that the real definition of broadcast quality is "whatever the TV engineer will put on the air." DCTV is really useful in the areas where the major-

ity of video is produced - cable TV and industrial video.

Computer-based animation is an area where Time = Money. Most production houses charge an hourly rate for their time or by the finished second for animation. Other people I know who do animation sometimes use a much simpler formula to charge their clients: "How many bills I have vs. what I need to charge to pay them." Either way, the quicker you can produce an animation the more cost effective you become. Right now the majority of work that I produce is done on Deluxe Paint III. I use a 3-D rendering approach only if there is no other way to achieve the same effect or the client demands it. I love to do 3-D projects as much as the next amigoid, but it is usually not as cost effective as 2-D animation (or as good as an artist can do simulating a 3-D environment).

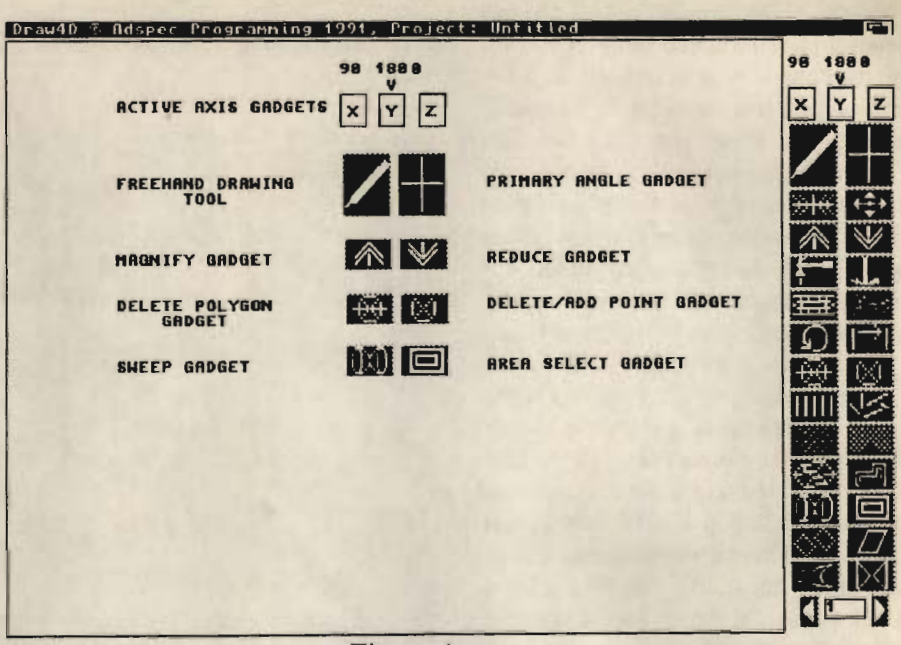


Figure 1

Because of the time limitations, I have been experimenting with a new package called Draw 4D Professional from ADSPEC. I am excited and happy with this package because it will render directly in DCTV's format! A typical image will render with texture mapping on my machine in about one to two minutes. Draw 4D Pro serves an important niche. It is not at this time as full featured as other 3-D rendering packages but still has many unique, powerful features. For accomplishing the majority of 3-D jobs it is more than up to the task. What I will attempt to do now is give you a description of how I created and animated the wine glass.

First, take a look at Figure 1. There are several gadgets that will be useful (not to mention necessary) to create our wine glass. Go ahead and fire up your Draw 4D Pro. At the top right you will notice the Active Axis gadgets. Click on the "Y" gadget and you will notice a letter "v" above it. Next, click on the Primary Angle gadget to stop the axis from rotating. Our display should have the z axis up and down and the x axis left and right. The y axis is oriented in and out of the screen. I like the fact that the separate axes are color coded. Take a look at Figure 2. Notice that I have indicated 13 points. Starting at the origin (the center of the z and x axis), a line will be drawn from point to point. Click on the Freehand Draw Tool. Position the tip of the tool near the origin. Hold the left mouse button down and drag the mouse to the right. You should notice that a white line should start rubber-banding out from the origin and that it is not connected to the tip of the drawing tool. Don't worry, that is normal, so go ahead and pull or drag the line until it coincides with point 1 in the figure. With your other hand, tap the Tab key to set the first point. The line you drew will then turn red. Hold down the left button again on the mouse. Drag out a white line from point 1 to point 2. Hit the Tab key again to set the point. Keep repeating the process until you reach the last point (#13), which should lie directly above the origin on the z axis. Your drawing should look somewhat similar to

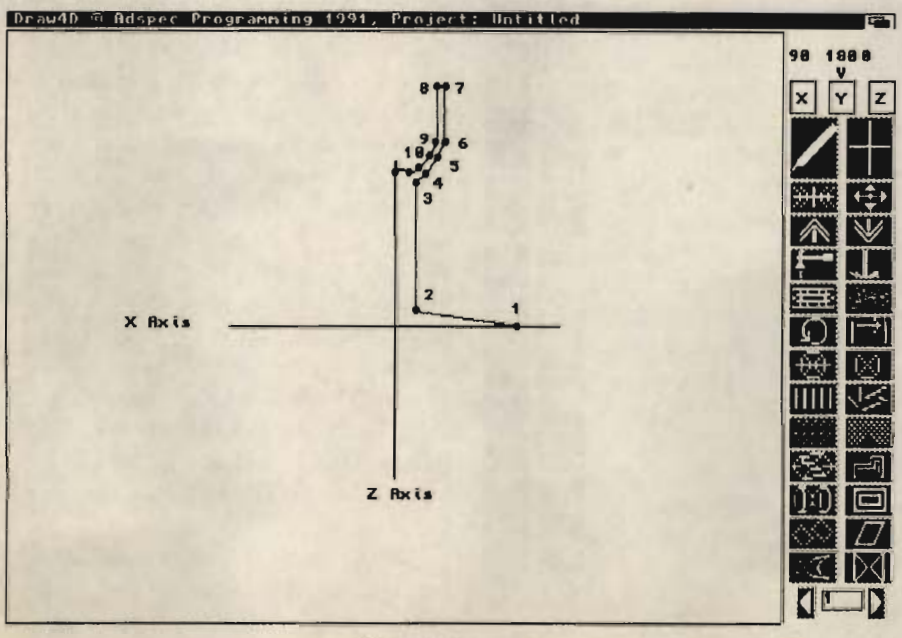


Figure 2

Figure 3. The Attach Point is the last point that you clicked on with the left mouse button. All the lines of your drawing or polygon should still be red to white. Go ahead and click the right button to set the polygon (all the lines turn black). Now click on the "z" button on the Active Axis gadgets. Go to the Sweep gadget and click the right button. A Sweep Defaults requester will appear. Change Segments to 36, which will make the glass appear smoother, then click on the Accept gadget. Click the left button again on the last point you drew to indicate again the Attach Point (all the lines should turn red and white again). Now click the left button on the Sweep gadget. You should have a wire frame wine glass similar or not unlike that of Figure 4. Click your right mouse button to set the object (lines turn black). Select the y axis gadget. Move your mouse pointer near the center of the wine glass and click the left button. The original template is selected. Delete it, then click again near the center of the glass. All of the lines should turn white again. Hold down the left Alt key on the keyboard and at the same time hold the left mouse button down and drag the wine glass to the center of the screen. Now let's go set the surface attributes of the glass.

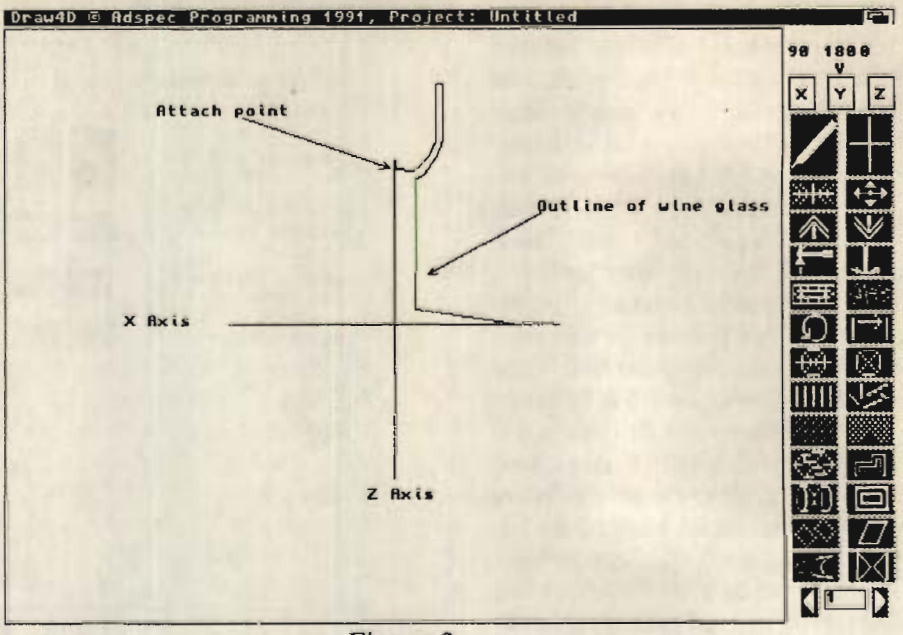


Figure 3

Go to the menu bar at the top of the screen. Under the Tools pulldown menu select Set Reflectivity. Adjust the Ref (reflectivity) slider at maximum (225). Set the Hrd (hardness) slider to the maximum also. Set the Trn (transparency) slider to 225. Set the RGB sliders to any color you wish, but put them at 50% of the maximum value. For example, to get a nice purple wine glass, set R to 102, G to 0 and B to 102. Next click the Accept button. Go to the Light/Texture pull-down menu. Select Set Shading. Set Phong to "on" and click on Accept. Next, select Fill Defaults from the Defaults pull-down menu. Click Light Mode, Fill Mode, DCTV Filter, Transparency, Phong and Rounding to "on." Click on Set Screen Mode. Change Overscan 2, Hires and Lace to "on." Set colors to 16, select DCTV then click Accept. Click on Accept on the Fill Defaults requester. We are now ready to do a test rendering. Before we actually render, make sure that the video out of the DCTV is hooked up to a composite video monitor. Go to the Tools pull-down menu and select Show Filled. It should only take 30 to 60 seconds or so to render the image. If you are using an RGB display you will see strange gray/green garbage on your RGB monitor and a wine glass on your composite monitor. Once it is rendered, go back to the layout screen. To do this, look or switch back to the RGB monitor and under the Project pull-down menu, select Return. You should now be back in the layout portion of Draw 4D Pro. And now let's animate!

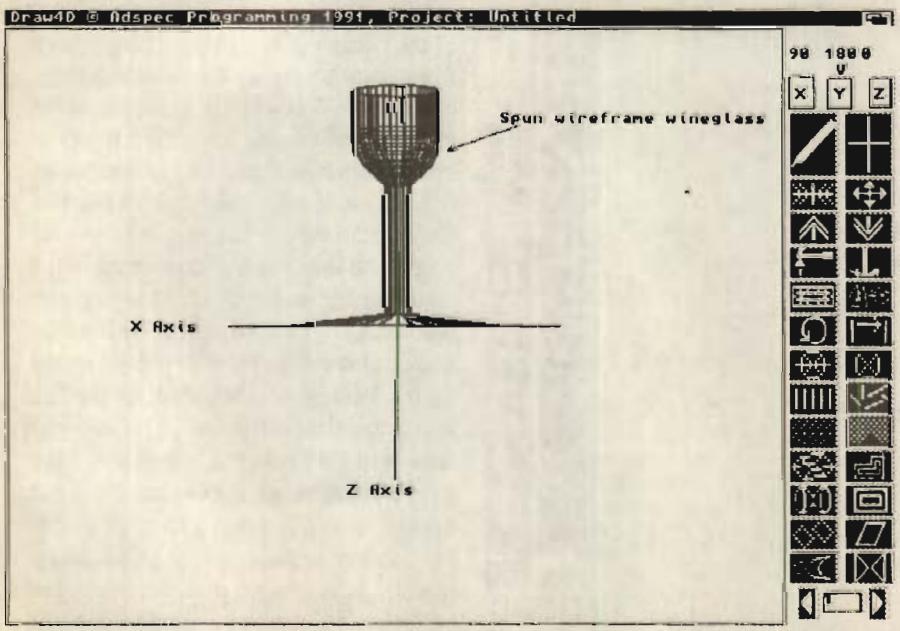


Figure 4

Make the x axis gadget active at the top right part of the screen. Click on the Primary Angle gadget to give us a view down the x axis. Go to the Tools pull-

down menu and select Make an Arc. Change Segments to 30 and then click Accept. You should see a circle appear centered by the origin. Click on any one of the vertices of the circle (pointy part of the "circle" where two lines meet) to make it active. Go to the menu bar and select the Paths menu. Select Make Poly a Path. A large Path Defaults requester box should appear. Find the row labeled "X." Now find the column labeled Rotate. Where X and Rotate intersect should be a number 0.0000. Change the number to 360. Select Accept. The circle should now be red to indicate that it is now a path. Pretty nifty, huh? Click the right button to set the circle. Next, click on the wine glass toward the middle (where the stem and the bowl meet) at one of the vertices to select an Attach Point there. Click the right mouse button to set it. Now go to the top vertex of the circle and click the left mouse button on it to set an Attach Point. Now hit the F2 function key. The whole circle should jump down so that the top of the circle coincides with the center of the wine glass (the top of the circle and the middle of the glass are touching). Click the right mouse button--almost there (pant!pant!)! Now click the left button on the wine glass to select it. Next, go to the pull-down menu and under Tools select Assign a Path. Next click on the circle. This assigns the glass to the circular path. Hit the F9 function key to preview the animation. Since we are viewing the animation from the "side" or x axis, the glass should be rotating to the right (or maybe to the left). Hit the Esc key to stop. At this point we have both previewed the rendered glass and the animation. Now let's save it on a disk. Let's view the animation from the front by clicking on the y axis gadget at the top right and then click on the Primary Angle gadget. Click on the Magnify gadget until the glass fills the screen. Hit the F9 key just to make sure it's going to move correctly. Good! Now go to the Tools menu and select Show Filled. When the screen begins to render, hit the Esc key to abort. Click on the Yes gadget on the abort requester. Next go to the Project pull-down menu to Save Anim.

Set the number of frames you want (30 or so is a good start). Set the frame range from 1 to 30 (or whatever you choose). Enter the desired directory name to where you want the animation saved in the "Save To" field. Most importantly, set Save To On or you'll render 30 frames without saving them (no, I was not dumb enough to do that--I just know of a friend who did). Once you do this, tell it to start rendering and spend an hour or so with your family while it crunches away. The finished animation can be loaded and played from DPaintIII.

As I stated before, DCTV is an amazing device that is very underrated. I wish Digital Creations would crash a MacWorld or two like NewTek because I think that DCTV in its own way is as revolutionary. I've shown it to many a Mac fanatic and sent them away stunned.

The Personal Single-Frame Controller

Single-Frame Controllers perform a very important role in the production of high-end computer animation. They act as the device used to make the frame-accurate edits required to allow the smooth, continuous motion of high-resolution 3-D objects rendered from a display device (Frame buffer) to either film or videotape. Notable among those that Amiga users are now using are the Lyon Lamb, V-Lan, BCD 5000 and the Diaquest. All of these units function as an editing controller via the serial port of the appropriate VTR. Until very recently, the cost of these units was several thousand dollars.

Paralleling the cost breakthrough recently made by the introduction of the Personal TBC by DPS Technologies, Nucleus Electronics of Ontario, Canada has introduced the Personal SFC (Single-Frame Controller), which costs $425. Unlike the Personal TBC, however, (again, no relation to the Personal SFC) which allows nearly any consumer VTR output to work with the Toaster, the Personal SFC requires a specialized industrial or broadcast frame-accurate VTR that has both SMPTE time-code capabilities and serial port control. (There are some hardware items that will convert parallel signals to serial at about $900 each.) This is not a limitation of the Personal SFC's capabilities, since all animation controllers share the same requirements.

Among the VTRs that are supported are SONY models BVU 800 series and VO9850 3/4 and 3/4 SP, BVH 2000 and 3000 series one inch, BVW 70/75 series Betacam and SP, DVR 10/18 D2 Digital. Panasonic AG7750 S-VHS, AU60/65 MII, AU640/650/660 MII. JVC BR-S 810/811 S-VHS (w/S-AF 911) (this last unit from JVC still requires some special handling by the software, you should talk with Nucleus concerning this for the specifics). All of these units, as well as any subsequent machines yet to be introduced must meet the following requirements to work with the Personal SFC: 1) the VTR must be a frame-accurate editor; 2) the VTR must have an internal SMPTE generator/reader; 3) the VTR must conform to RS422 serial control standards.

Nucleus has plans to support each new VTR that has these capabilities as they become available for testing, but it is important to note that most manufacturers attempt to follow control protocols that can be recognized by the majority of existing professional editing controllers. This is why even though your VTR may not be among the list of those supported, it will probably work as long as it meets the specifications mentioned above if you take the time to make some minor tweeks in the set-up portion of the Personal SFC software. (Such was the case in my personal set-up when using the JVC KRM 820/tc MII format editor.)

The Personal SFC package consists of software, a specially constructed serial cable and a sparse but well-written manual. As advance warning to those of you who might consider "evaluating" the software while attempting to use a standard serial cable, don't. Inside the Personal SFC cable's connectors there are some delicate custom electronics and using a standard serial cable will probably damage either the Amiga serial port, the VTR, or both. Installation of the software is a simple matter of clicking an install icon.

By following the manual's instruc-

tions (I usually don't read them, but this time I was glad I did), I was able to install the entire package in less than five minutes, and although the software originally thought my VTR was a Sony BVW Betacam editor (I should be so lucky), a quick phone call to Nucleus reacquainted me with a feature of my VTR I had forgotten about, which is the switchable identifier that allows my VTR to emulate the control handshakes of other more popular VTR personalities. After flipping the appropriate dip switch on my VTR, I was on my way.

The software defaults to the set-up menu every time it is launched, and once you get past the set-up menu, the main control screen gives you complete remote control of your VTR's functions. This control interface is very intuitive, emulating the front control panel of your VTR, complete with SMPTE address display, and large button gadgets for all functions including forward and reverse variable speed shuttle that can be either mouse or joystick controlled. I was gratified by the amount of thought put into the design of the interface, which by its simplicity and logical layout invites you to use it just as you might use any remote controller, without a second thought. From the main control screen there are two button gadgets that bring you to the other two menus, the Lapse button that brings up a requester for time-lapse input, and the Anim button, which brings up the Animation Sequence editor. The Time Lapse function is very straightforward. You enter the starting time, the ending time and the frame count (number of frames captured in each exposure) and a begin gadget. This type of animation technique is wonderful for nature scenes such as a flower opening and closing, or a wind and cloud sequence. The Animation Sequence editor, on the other hand, is really the heart of the system. From this menu you select whether you are going to record frames previously rendered and stored to disk or directly rendered to your display device. The display devices supported include the Firecracker 24, Colorburst, HAM-E, DCTV and, of course, the Video Toaster's Frame Buffers.

"Pre-striping" your tape with time code is an absolute must for all types of professional editing with SMPTE and the Personal SFC has a utility to help make this task easy to accomplish. You also can select which SMPTE mode you wish to use, either Drop Frame or Non-Drop Frame. Choosing whether or not to use Drop Frame or Non-Drop Frame mode is rather simple. If you are using NTSC and wish to "Bump" your animation to a direct color format such as 1 inch, you should choose Drop Frame mode to allow for properly color framed edits, otherwise you will have a severe case of jitters and color fades when you attempt to make the dub through the 1-inch machine's TBC. The default standard is non-drop frame, which is used by most animators because it allows more precise timing control over long animations. The manual contains a short, but nicely explained, primer on the subject.

One of the advantages of the Personal SFC is the ability to structure combinations of loops (multiple recurrences of sequenced frames) and hold frames. This saves enormous amounts of time in the total render time of some types of animations. This feature alone makes it worth the money even if you already own one of the other stand-alone animation controllers. The editing interface for structuring previous Anims and loops is a simple insert, copy and paste type operation. Another nice thing about having this much software control is that there are times when you might want to insert frames or add frames to an existing sequence that didn't completely finish because of a machine crash or power failure. The Personal SFC gives you this flexibility along with the added capability of loading previously compiled lists and a printout, if needed.

Another time-saving feature of the Personal SFC is preview, which actually will create a scaled-down version of your animation in a gray scale, window-boxed format. Although it still takes nearly one-third the time of a regular animation to render, it can keep you from making costly errors in the long run. For the purposes of expedience, I chose to use the Personal SFC on a simple Toaster animation rendered directly to the frame buffers without using the preview mode. After a few minutes of trial and error concerning the sequence of events switching back and forth between the Personal SFC software and the Switcher Module, I was able to complete successfully a three-second animation in a little less than 45 minutes. Upon viewing the finished animation both in real time and frame-by-frame, I have to say that it was absolutely flawless.

Nucleus has done an excellent job in designing a product to answer the needs of computer desktop animators, and from the looks of things, Nucleus will probably simplify the animation process even more as feedback from current users comes in. On a scale of 1 to 10, this product rates a 9 for innovation and an 11 for affordability.

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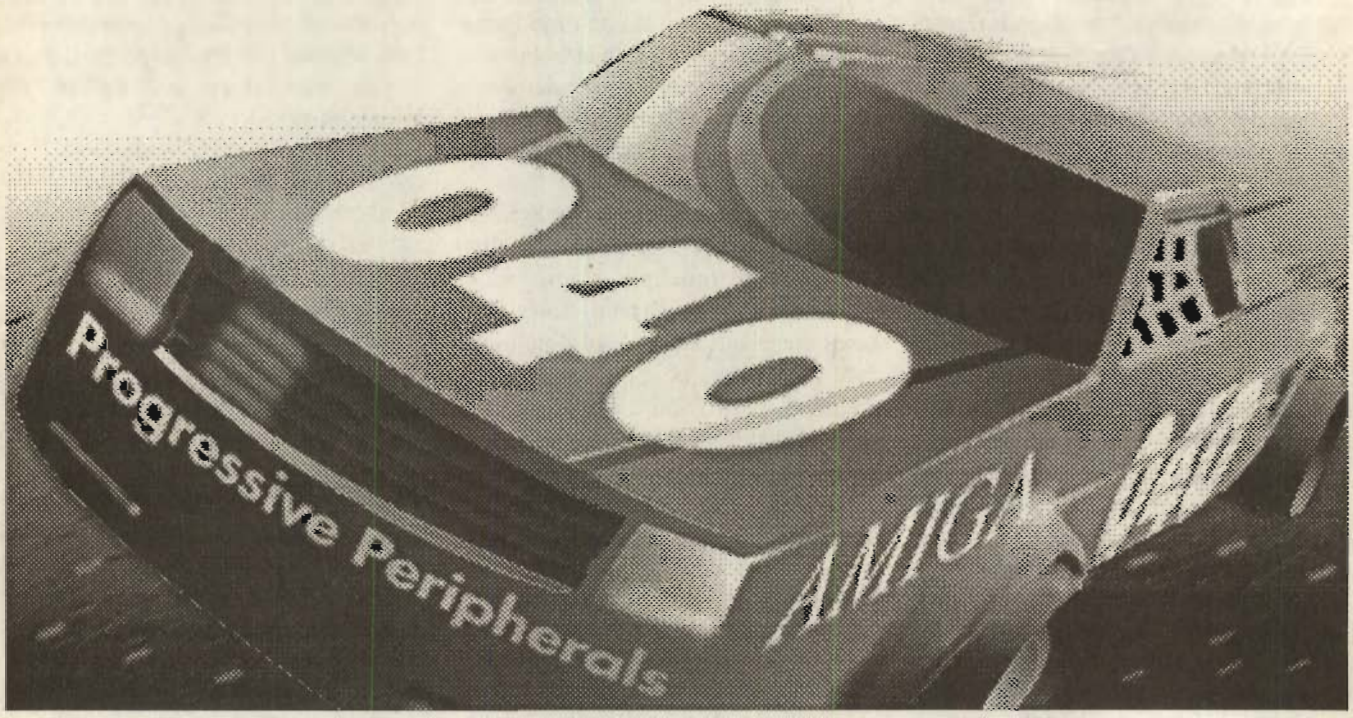
Progressive Peripherals 68040 Accelerator Review



From the artist's standpoint, working in 3-D computer graphics differs conceptually from most other art forms primarily because of its lack of immediacy. If you're a musician, you can play and hear a tune as soon as you think of it. If you're a painter or sculptor, it may take some time to see the final image or object you're creating, but because you see every element as soon as you create it and are intimately involved in the creation process, the lack of immediacy generally isn't a problem. However, because in 3-D graphics the rendering process can take hours or even days before you see anything, and all you can do is wait, it's very difficult to keep the creative juices flowing. The artistic process necessarily involves a great deal of experimentation, and the faster you can see interim results the closer you'll be able to come to realizing your original vision within a given time frame. That's why 3-D computer artists crave speed--so they don't lose momentum.

Today's high-end personal computers are extremely fast. Almost anything you can use them for takes place at many times the top speed available only a few years ago. Spreadsheet re-calculation, word processing search-and-replace and desktop publishing screen re-draws are almost instantaneous. But if you work with 3-D computer graphics, you're probably painfully aware of the fact that nothing short of a Cray or some other multimillion-dollar computer is going to work as quickly as you want it to. This is primarily because as many as several million calculations must be performed

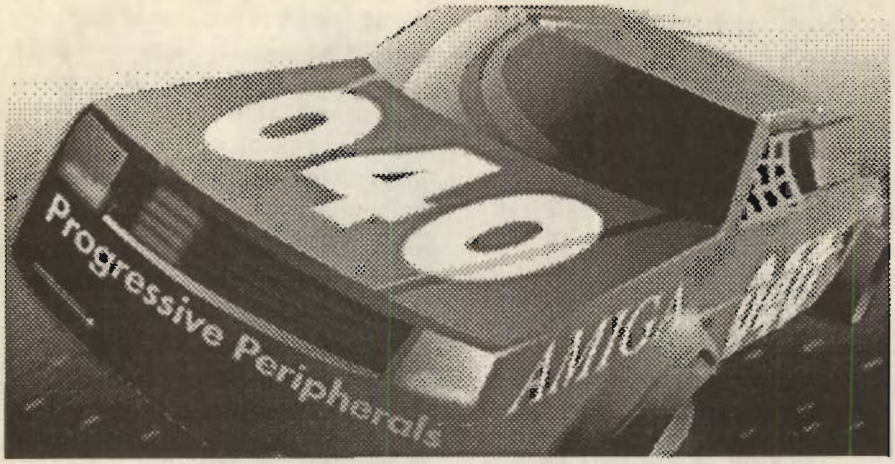
to render a single image. Three-D computer graphics artists continually seek out new ways of improving speed, and while software optimization certainly helps, the only way of achieving significant speedups is with more powerful hardware.

The powerful 68040 microprocessor has been slow in coming to the Amiga market, mainly because of technical problems on the part of Motorola, its developer and manufacturer. This evolutionary chip, however, is finally available for Amiga computers in the form of Progressive Peripherals' 68040 accelerator for Amiga 2000 and 3000 computers. Alternative 68040 accelerators soon will be available from other companies including Computer Systems Associates (CSA) and Great Valley Products (GVP).

One of the 68040's biggest advantages over its ancestors is the built-in floating-point unit (FPU). You've probably heard of the 68881 and 68882, which are external FPUs for the 68020 and 68030 processors, respectively. The purpose of the FPU is to provide hardware support for calculations involving decimal fractions, of which there are many in most 3-D graphics software. Such calculations performed in hardware can be achieved many times faster than the same calculations performed in software. However, because previous incarnations of the FPU were in separate chips, there is a slowdown that results from the bottleneck in communications between the FPU and CPU. Because the 68040's FPU is built-in, there's no more bottleneck, so floating-point calculations are several times faster. To fit everything into one chip, however, Motorola had to drop some of the least-used FPU instructions built into previous versions, so most transcendental functions (e.g. Sine and Cosine) were sacrificed. On the other hand, the most commonly used instructions now execute significantly faster, and in some cases many times faster, in the 68040 than in the 030.

Since the bulk of calculations in ray-tracing involve floating-point math, you might be interested in exactly how much faster the 68040's floating-point works. A friend wrote a C program that performs four floating-point calculations--an addition, a subtraction, a multiplication and a division--a specified number of times, then calculates the number of millions of floating-point calculations per second, or megaflops. The program running 20 million iterations on his Amiga 3000 with a 25-megahertz 68030/68882 combination yielded about .4 megaflops. On the 68040 the program ran at about 1.6 megaflops, or four times as fast. Since divisions are the slowest operation and are generally used less than one-fourth of the time, real-world improvement may be better than 400 per cent.

The model I bought, the Progressive 040/2000, goes in the 2000's CPU slot, replacing any 68030 or 68020 card. You can get it with 0, 4, 8, 16 or 32 megabytes of 32-bit RAM. If you think you may eventually go to 32 megabytes, you should



start with 16 megs, the minimum configuration with high-density memory in the form of 4-x-8 SIMMs. That's the one I bought. Of course, if you buy the 040/3000, you'll save money because it can use the 32-bit RAM built into the 3000. Unfortunately, there are no 32-bit memory expansion cards available for the 3000 at this writing, so you'll be maxed out at the 3000's current upper limit of 18 megabytes. The clock speed on both models is 25 megahertz, but Progressive promises an upgrade to 33 megahertz shortly for an additional 33% speed improvement!

Because I bought one of the very first units Progressive shipped, I also needed to get a pre-release version of Commodore's 2.0 Kickstart ROM, without which the 68040 card wouldn't work. Since then the technical wizards at Progressive have come out with a fix that allows the accelerator to work with the Kickstart 1.3 ROM, which is available free to owners of the card. I'm still working under 2.0, which seems relatively problem-free. When I installed the 040 I also installed a device called MultiStart II, which has sockets for both the 1.3 and 2.0 ROMs (plus a third ROM, such as a 1.2 Kickstart) and lets you switch between them on boot-up or re-setting the computer. It's easy to use--just hold down the "Vulcan nerve-pinch" keys (Ctrl-Amiga-Amiga) for five seconds to switch between the two keyboard-switchable ROMs. There's no problem using the default 2.0 ROM, but when I switch to 1.3 the computer usually crashes during or shortly after boot-up and doesn't respond to a reset, requiring a power-down to get started again.

Well, at this point you're probably wondering whether all this expense and trouble were worth it. All I can say so far is that I'm very happy with the new board. My previous accelerator was the Commodore 2630, a 25-megahertz 68030 accelerator with a maximum of four megabytes of 32-bit RAM, which I souped up to 28 megahertz by replacing the timing crystal. Shortly before I installed the 68040, I used Imagine to ray-trace a complex test image containing thousands of polygons, which took about two hours. With the 68040 it took 20 minutes, which is about a six-times speed-up! The improvement seems to vary quite a bit depending on the software and what's being rendered. For example, a simple ray-traced image incorporating a refractive "lens" wasn't even twice as fast. On the other hand, a ray-trace sent to me by an AVID reader that required more than 24 hours on his unaccelerated Amiga 500 took only about 20 minutes with the 040.

Of course, compatibility is an important issue when upgrading to a new accelerator. I've found that most software that works with the 68030 performs flawlessly on the 68040. The one exception was Scenery Animator, the wonderful new version of Scene Generator, of which the original release would only work on systems with 68020/68881 or 68030/68882 combinations. The publisher, Natural Graphics, has revised the product to include two versions of the program: one that works with the 68000, and a floating-point version that works with all accelerators including the 68040. Contact Natural Graphics for an upgrade.

One thing the 040 doesn't speed up is animation playback. A full-overscan interlaced DCTV or high-resolution animation still runs at only a few frames per second, much too slow for real-time recording onto videotape. This is the result of the Amiga's video architecture and is limited by the speed and size of Chip or Graphics RAM. A promising new product called the Chip RAM Accelerator whose producers claim will solve this problem was scheduled to make its debut at the AmiExpo in Oakland, Calif., in early October but unfortunately has been delayed. In talking to the developer, PPV of Canada, I've learned that Amiga users can expect up to 10 times faster throughput of graphics data in Chip RAM, resulting in frame rates of 30 per second or better, even in high-resolution overscan interlace mode. The Chip RAM accelerator won't be cheap, but it may save you thousands of dollars by making a single-frame controller/recorder set-up unnecessary.

Progressive 040/2000 and 040/3000:
Progressive Peripherals & Software
464 Kalamath Street
Denver, CO 80204
(303) 825-4144

MultiStart II
DKB Software
832 First
Milford, MI 48381
(313) 685-2383

Scenery Animator
Natural Graphics
P.O. Box 1963
Rocklin, CA 95677
(916) 624-1436

Chip RAM Accelerator
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Aid Feature!

chroma Key

Affordable, Perfect Keying from Perfect Video Productions

What's the difference between a piano and an advanced piece of video equipment? Give up? Then stay away from my video equipment!

You'll probably find it more difficult to point out the similarities than the differences; so the question should be, "How are a piano and a video key device alike?" The answer: They both use keying to modulate the information code barrier.

To "key" a piano means to turn on and off and otherwise "modulate" a carrier of a code. The code carrier in this instance is a set of sound (pressure) waves in the air. The device by which you modulate the code carrier is called a "key." Not a "keyer," which would be the person using the key, but a key. A key can be pressed either softly, resulting in a soft sound, or struck hard, resulting in a loud sound. This is called modulating the amplitude (height) of the carrier wave. As you go up and down the keys, you compress and expand the cycles of the wave and are, therefore, modulating the frequency of the carrier. Amplitude Modulation and Frequency Modulation. AM and FM. Hmmmmm. I know I've seem that somewhere else before.

An electronic key is a device or capability of a device that modulates an electromagnetic carrier; for example, a telegraph key. Video also uses keys, and although they are a bit more complex than the piano and telegraph keys, similar principles apply.

There exists two types of video keying: inlay and overlay. I'll limit this discussion to the overlay key because that is the nature of the subject of this first look -- the CK-1, a professional chroma key device at a price that a small studio can handle.

An overlay video key turns off, or "clips," a percentage of a specific portion of the video signal, then overlays the remaining signal on a second "background" signal. This background signal can comprise either a static, genlocked computer graphic or dynamic video. The background video contributes to the new combined signal, that portion which is equivalent to that clipped from the overlay, or foreground, signal. The overlay signal contributes to the combined signal all of itself that has not been clipped. The usual practical effect of this is to remove a single-colored background from a video picture, and overlay the remaining picture onto a second video picture.

Every video signal has a "Y" component, which is the luminance (brightness) value of the signal (also called luma), and two color components, which are lumped together and called chrominance (chroma). A luma key device affects only the luminance or Y component of the video signal. A chroma key device affects the luminance and chrominance (Y-C) components. Usually, that is.

Every video key device has some way to adjust the "clip level" (that percentage of a portion of the video signal to be clipped). On a luma key device, the clip level can be set at anything from 0% to 100% of the luminance portion of the signal, measured from either white or black. If the clip level is set at 15% measured from black, all elements of the video picture darker than a dark shade of gray will be clipped. In those parts of the picture that have been clipped, the background video will show through. Likewise, if you set the clip level at 15% measured from white, all elements of the picture brighter than a light shade of gray will disappear, allowing the background video to show through.

A luma key device affects only the "Y" or luminance portion of the video signal, but is not limited to monochrome video. I recently used such a device to key myself over a full-color satellite picture of the Bay Area. An Amiga frame buffer supplied the video satellite image. I connected a video camera to the luma key and set up a vertical, evenly white background against which to stand. I lit the background so no shadows (I thought) would fall on it, and then carefully arranged lights on myself, the subject to be keyed. I set the clip level on the luma key device at approximately 10% measured from the white and voila! There I was on the video monitor, standing before a giant satelitte picture of the Bay Area. There was, however, a noticeable aura around me. I attributed this to slight shadows falling on the white background, raising the luminance of my silhouette on the background above the clip level; and I adjusted the lighting to get rid of them. I found that I could only minimize the shadows if I didn't move very much with respect to the lights. I added more lights, and by this time I had enough lights to get rid of the aura, another problem arose. My head was sweating, and reflections from my forehead were rendering it in the clipped area. San Francisco was showing through!

I next tried a black background, with the clip level set at 15% from the black, so that anything darker than a dark gray would be clipped. I had to lower this figure to 8% before Sausalito stopped showing through strands of my hair; and I never succeeded in keeping San Mateo out of my mouth and Oakland out of one armpit. The calm, blue waters of the Pacific sloshed out the other armpit.

While (with appropriate and careful lighting) luma keying can be successfully used to key static objects, it has been completely abandoned by the video industry for use on dynamic subjects. With good reason -- reflected highlights and background shadows when the white is clipped -- armpit and mouth shadows when the black is clipped. And no tolerance of lighting problems! Two kitchen appliances for the Amiga that currently have luma key capabilities are the Video Blender and the Video Toaster.

A chroma key is far superior to a luma key, when quality of circuit design is ignored. In addition to luminance values, a chroma key device differentiates between chroma hues, ignoring all but very specific ones. Because of this, chroma keys can have a high tolerance for lighting problems.

For many years, the video industry has used chroma key devices that are designed to differentiate between a particular blue, called "chroma blue," and all other hues. Chroma blue is that shade of blue that shows the highest response in the blue channel of a video camera. Chroma blue was chosen because it does not appear in flesh tones and can be easily left out of clothing. The main drawbacks to chroma blue are that it necessitates keeping a very specific color of backgrounds and paint in stock, and removes the possibility of successfully keying richly blue objects. There also remains a certain touchiness with respect to lighting.

Video contains three primary colors -- red, green and blue. To remove the main drawback of chroma key -- no choice of background colors -- it might be necessary to have a chroma key device with the ability to independently set clip levels for each of the three primary colors. If one were able to separate the red, green and blue components of a video signal to clip a maximum amount of one color and combine that with minimum clip level amounts of the other two primaries, one would achieve the ability to select not only any specific color as a background, but definable ranges of color. The ability to define a range of color to be clipped would remove all criticality from background lighting, because shadows could be factored into the color range clip definition.

This type of chroma key device is in fact what Perfect Video Production [(408) 732-0161] has recently brought to the market. A visit from Alex Dondysh, President of Perfect Video Production, brought me up to speed on state-of-the-art chroma key developments, and gave me some hands-on experience with his company's new chroma key device, the CK-1. I was very impressed. The CK-1 seems to successfully answer all the problems outlined in my discussion above. I tested the CK-1 under adverse conditions, with bad lighting and rapidly moving objects. In each instance, the CK-1 could be adjusted for perfect keying.

The CK-1 (chroma key #1) is housed in a desktop metal case. The top of the case contains six knobs in two rows. The right-hand row, from top to bottom, is labeled Key, Hue and Saturation. The left-hand row is labeled Red, Green and Blue. In addition, to the left of the color knobs are three lighted pushbutton switches.

The three lighted switches are the background color switches. If the background against which you place keyed subjects is red or any reddish hue, then push the top button. A greenish background necessitates pushing the second button, and a blue background the third button.

The left-hand row of color knobs is the separate clip level adjustments. These fine tune the clip levels for each compo-

nent color. In the right-hand row of knobs, the top button (labeled "Key") sets the key signal level for various types of equipment to which the CK-1 is connected. The second knob, labeled "Hue," fine tunes the CK-1 to the actual background color; and the third knob, "Saturation," adjusts the clip levels for all colors depending on the overall picture color and brightness.

The back of the CK-1's case contains, from the left to right, the power cable input. The CK-1 takes a plus and minus 12-volt and plus 5-volt power supply. Any standard computer supply would work, although the CK-1 comes with its own. To the right of this power supply input is an S-VIDEO IN jack. This accepts input from a video camera, camcorder or VTR in SVHS, Hi8, Ed-Beta or MII video formats. If a composite input is desired, an optional Y/C Separator is used. Next is a cover which, when removed, reveals four eight-switch switch blocks labeled S6, S7, S2 and S1. These are used to adjust the time delay of the video and key out signals to the specific equipment connected to the CK-1. Next is the S-VIDEO OUT connector, and two BNC connectors, one above the other, for Composite VIDEO OUT and KEY OUT.

KEY OUT supplies the key signal to a computer genlock, a switcher with frame synchronizer or a mixer with a built-in frame synchronizer. The CK-1 is designed to work with any device that has an EXTERNAL KEY IN, and with any device that can be modified to accept external key in. As such, it is a cross-platform, non-Amiga-specific video device. I have seen it work with a Panasonic WJMX

12 mixer, a SuperGen 2000S and a Video Toaster. With the Panasonic mixer and the SuperGen, the CK-1 nicely passed S-video, with its capability of 400 horizontal lines of resolution. Since the Panasonic WJ-MX12 has built-in frame synchronizers (as well as the WJ-AVE5), the CK-1's output can be keyed over live or recorded dynamic video. This could let you walk down the streets of Moscow without ever leaving your home. Or, in a more practical, professional setting, let a cardiologist stand next to a giant, beating, fluoroscoped heart and point out the arterial lesions that his audience of physicians must learn to recognize before inserting a balloon catheter. Since the WJ-MX12 does not have an EXTERNAL KEY IN, it must be modified to accept one. Perfect Video Production can do the modification for about $100, and its modification includes installation of a GPI trigger for automatic triggering of editing events. Using the switching functions of the mixer and the keying function of the CK-1, reverse keying is possible.

During Alex's visit, I selected a medium green background against which to place the objects to be keyed. I purposely chose a medium green background because I was wearing a light green shirt, and I wanted the CK-1 to get a thorough test. Industry units that demand only

"chroma blue" backgrounds neccessitate removing all blue from a subject to be keyed. Unknown to Alex, I "accidently" bent a corner of the background so that when an oblique light source was set up, it would cause the bent corner of the background to be covered with shadow. I set up the worst lighting I could think of -- a 100-watt bulb with an aluminum reflector at a 35-degree angle to the background (shudder!) and about five feet away. We hooked up an Amiga 2000 with an internal SuperGen 2000S, and also connected a Panasonic WJ-MX12 mixer. The camera was a Panasonic industrial unit.

The first keyed object was me in my green shirt. I watched the video monitor as Alex aimed the camera at me and adjusted its focus and adjusted clip levels on the CK-1. He had loaded a DPaint color-cycling graphic of a weather map, and there I was, standing in front of the weather map, green shirt and all! I noticed that where my torso cut across the lower left of the graphic (where the background was bent), there was a slight pixel border breakup in the picture. Even so, I was amazed at the key quality, and the selectiveness of the unit in discriminating between two such close hues of green. I pointed out the breakup to Alex, he turned the green clip level knob slightly and the breakup disappeared. As I write about this, I am tempted to use too many exclamation marks, so I'll simply give you a transcribed portion of my tape-recorded notes:

KC: "There's a dark area in the lower left-hand corner. Clip levels aren't set yet, and I can see a two-pixel border around a pack of Marlboro cigarettes. (Alex adjusts the clip level.) There's a dark shadow area on lower left of background, but that doesn't make any difference. The box is shiny, yet there is now absolutely no border around it. (Alex puts his hand in front of the camera.) There's just a tiny bit of border between the fingers, where the darkest shadows are. (Alex adjusts the clip level.) That's beautiful! The border has completely disappeared! The shadows of Alex's hand that are cast onto the background with this single bad light source show up on the monitor as shadows that are cast directly onto the graphic!"

ALEX: "Yes, it will repeat the shadows."

KC: "With the bad lighting, light source at 35-degree angle off the background matt, there's a slight bit of breakup when the cast shadows are almost black."

ALEX: "When the camera is out of focus, also, you always get borders."

KC: "When I take the clip level down to minimum, there is absolutely no border, and this lighting is absolutely non-critical. It's less than non-critical. It's crap lighting. I can't imagine shooting video under these conditions, let alone keying. Alex is waving his hand in front of the camera very rapidly, and there is no break-up on the hand except, in this bad lighting, where the almost black shadows lie in the "V" of a couple of fingers. Use another light and the keying would be perfect."

Easy-to-use, non-critical lighting, background colors selectable, keying over video when a mixer or switcher is used, no pixel borders, 400 lines horizontal resolution and at a grand, cheap! I asked Alex which device he preferred to hook up his CK-1 through. He grinned and told me that he preferred the Sony production switcher. "Signal quality of the switcher itself is great, even though they did analog to digital and digital back to analog, they lost no resolution whatsoever. That impressed me because when you use a mixer you lose resolution. Unfortunately, it costs about $70,000." How much resolution loss on the Panasonic? "Not much, but if you look closely, you can notice it."

Here's the instructions for using the CK-1 to replace the Video Toaster's very limited luma key function:

TO USE WITH THE TOASTER:

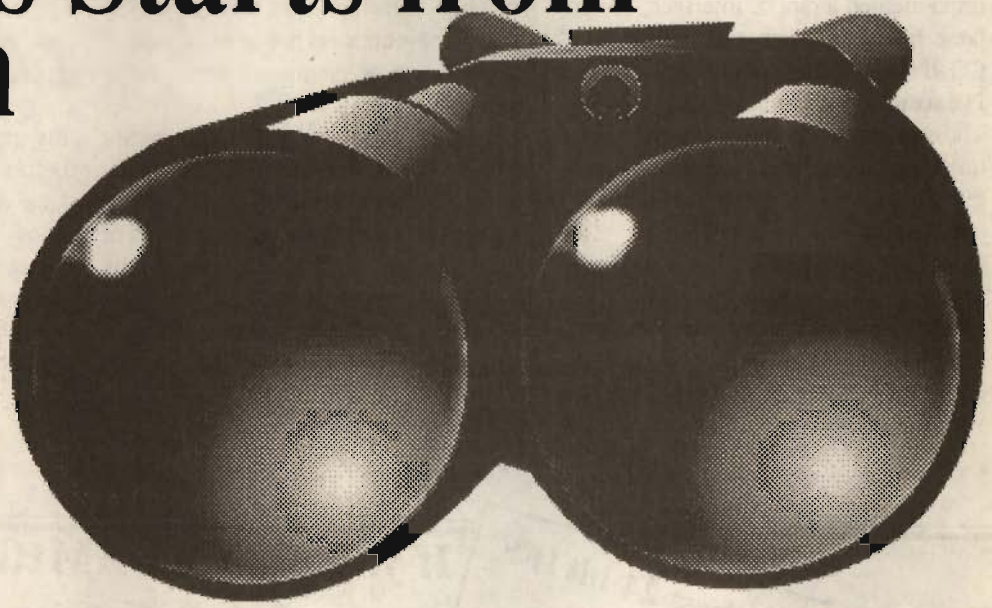
- Connect CK-1 "Composite Out" to Video Toaster's Channel 1.
- Connect CK-1 "Key Out" to Video Toaster's Channel 3 or 4.
- Connect Camera output to CK-1 Input.
- Go to submenu D of the Toaster Switcher crouton menus.
- Select "KeyHole" effect (this looks like a keyhole).
- Load the background graphic in buffer.
- On Program Bus, select DV1.
- On Overlay Bus, select Channel 1.
- On Preview Bus, select Channel 3 or 4, depending on whether the CK-1 "Key Out" is connected to the Toaster's Channel 3 or 4.
- Set Video Toaster Fader control manually to around 120.
- Click on Scissors to make the button white.

That's it.

Adolph Gasser in San Francisco and H-T Electronics in Sunnyvale, Calif., are currently the distributors for the CK-1. Lots of 10 or more can be ordered directly from Perfect Video Production in Sunnyvale at (408) 732-0161.

Review!

CG-II: Shereff Systems Starts from Scratch



The best thing about writing for trade magazines is that I often get to see products in the formative stage, long before they have been brought to market. It's exciting to watch the development of a product, and it almost makes me feel like a participant, although I'm simply an observer.

On Oct. 21, 1991, Shereff Systems, manufacturer of that mainstay Amiga video titling product Pro Video Post, celebrates the fifth anniversary of the introduction of its very first Amiga titling system, CG-I. Celebration plans include the announcement of CG-II, Shereff's fifth Amiga titling system in as many years.

CG-I, the first character generator for the Amiga, was released as an emulation to industry video character generators. The reasoning was, people who had used video character generators would find CG-I simple to use. Shereff Systems continued development of its product, and the next year Pro Video was released, to be followed, consecutively, by Pro Video Plus, Pro Video Gold and Pro Video Post. Here the story breaks, because Shereff Systems has gone back to basics and started from scratch with CG-II.

CG-II will be a smaller, less expensive program than any of Shereff's other releases, and the programmers' priorities have been reliability, speed and flexibility in getting a job done. CG-II is also designed as a platform on which to build future releases as Shereff Systems determines the needs of the market. For example, will 24-bit titling strangle the market for native Amiga character generators? If so, Shereff Systems wants to be ready.

CG-II will list for $199.95, which puts it in the same price range as some of the titling software marketed to the family camcorder set, such as AlterImage. Make no mistake, though, CG-II is a professional-quality product. It will not have the digital video effects of Pro Video Post, but it has several capabilities that are very fine indeed.

CG-II will come standard with six fonts, each in nine sizes. A convert program packaged with CG-II will convert standard Amiga color fonts of one, four or eight colors into fonts usable by CG-II. The beta version I am working with also has the ability to convert fonts from Pro Video Plus, Gold and Post, Toaster anti-aliased single-color fonts and Broadcast Titler 1 anti-aliased single-color fonts. The bells and whistles have not yet been decided on, but it will have the normal page and line transitions. It requires two megabytes of RAM.

The unfinished version I've worked with has several nice--and one outstanding--features. I started in video with an Amiga and, therefore, never got used to the video-industry standard character generator configuration. That explains my initial purchase of Broadcast Titler, with its Amiga interface, over Pro Video. I love them little mousies!

Now, finally, Shereff Systems has implemented a mouse interface, and it's done it with a competitive vengeance! CG-II's use of the mouse is the simplest I've seen yet, and simple means intuitive. The user has two options: Program functions can be accessed by pressing any of the 10 "F" keys, or the shift key in conjunction with any of the "F" keys. This will bring up a requester for the specific function. For example, press F1 to set line size and distance of the characters from the bottom of the line. If, like me, however, you have a short memory and you love to stroke your mouse, simply move the mouse cursor to the top or the bottom of the screen, and two simple lines composed of rectangular function boxes become visible -- one line at the top of the screen and one at the bottom. Clicking the left mouse button when the mouse cursor is over one of the rectangles in either line accesses the requester for that option. Slick! The top lines correspond to the "shift F" keys, and the bottom line corresponds to the row of "F" keys. The requesters can be manipulated either by use of the mouse or the arrow keys.

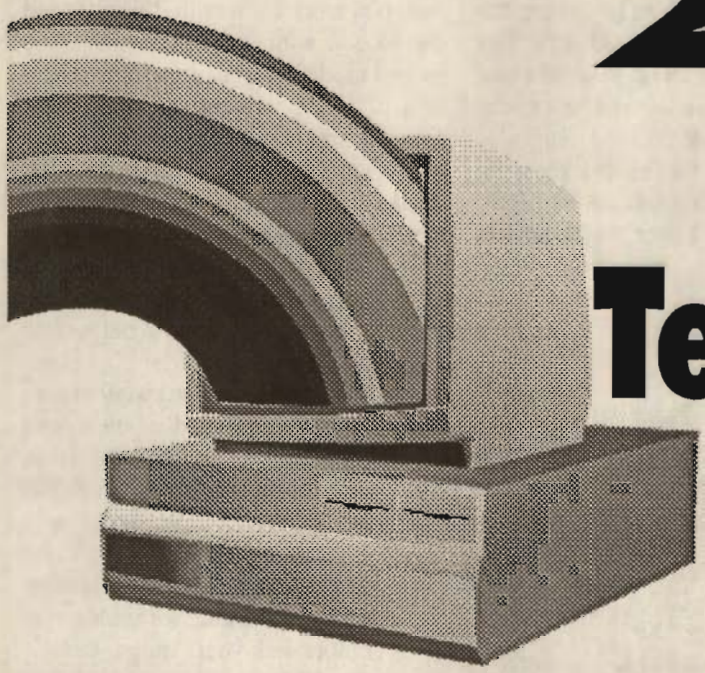
When editing text, the text cursor cycles from red to white to yellow so that you know exactly where on the screen you will be entering text. Begin a line of text anywhere on the screen simply by moving the mouse cursor to a chosen spot and clicking a button. The text cursor immediately jumps to that point, even it it's in the middle or near the end of a line that has not been used!

Drawers named PvFontsBoot and PvPicsBoot are designed to hold the fonts and pictures that are loaded into RAM when the program is booted. This allows great flexibility in memory management, because the contents of these drawers can be modified simply by dragging icons between drawers. Shereff Systems intends the release version of CG-II to save icons for jobs, so simple clicking on a job icon will boot the program and load the job, as well as all fonts and pictures necessary for that job.

CG-II is fast and easy to use. As is my practice, I worked with the program before ever looking at the (typewritten, beta version) manual, and the only options I didn't quickly discover myself concerned the convert program. I look forward to working with the completed version of this character generator with no learning curve.

Avid Feature!

24-bit Amiga Technology



During the last year a significant number of 24-bit hardware products have become available for the Amiga. No longer are we limited to only 32 or 64 colors for producing video graphics. Even the 4,096 colors found with HAM paint programs can't match the potential millions of colors that these various 24-bit products can produce. The two most apparent benefits of having so many colors to work with are photo-realism, or the ability to generate realistic looking images, and anti-aliasing, or the smoothing of edges that normally may suffer from the jaggies.

When working with any of the Amiga's native display modes such as those found with Deluxe Paint or even Digi-Paint's HAM mode, only 16 shades of any color can be displayed. Proving this is simple. Use your favorite paint program and try to generate a 24-shade (or any number greater than 16) color spread using light blue as the first color and dark blue as the last color. Despite the fact that you may be using a 32- or even 4,096-color palette, you cannot generate a color spread with more than 16 shades of blue or any other color.

That has all changed with the arrival of 24-bit display hardware. Having 24-bits per pixel means that eight bits of red or green or blue color information can be assigned to each pixel, with color spreads having up to 256 shades (instead of just 16 shades) for incredibly smooth gradient fills and backgrounds. This translates to 256 shades (2 raised to the 8th power) of red, green or blue per pixel. And 256 shades of red times 256 shades of green times 256 shades of blue equals a total of 16,777,216 displayable colors, which is usually rounded off to 16.8 million colors. This explains the claims of 16 million colors on-screen when using 24-bit technology. It's important to understand that so many colors are displayable only when using an RGB monitor and an RGB signal. When using a composite video monitor and a composite video signal, perhaps two to four million colors are actually being displayed because of the nature of the composite video signal. This is still enough to produce smooth, gradient backgrounds, eliminate the jaggies and generate realistic-looking images.

By now almost everyone has heard of the Video Toaster and the amazing things that it can do. With a list price of only $1,595 and an Amiga 2000 series computer to work with, the Video Toaster combines a four-input video production switcher with a color background generator and two frame buffers (for a total of seven channels to perform dissolves, wipes and other effects with) along with a real-time framegrabber, character generator, digital video effects, genlock and chroma processor. All of this resides on a card that fits inside the Amiga's video slot. The Toaster also has a 24-bit paint program called ToasterPaint that works with a HAM display (much like that found with Digi-Paint) while creating the im-

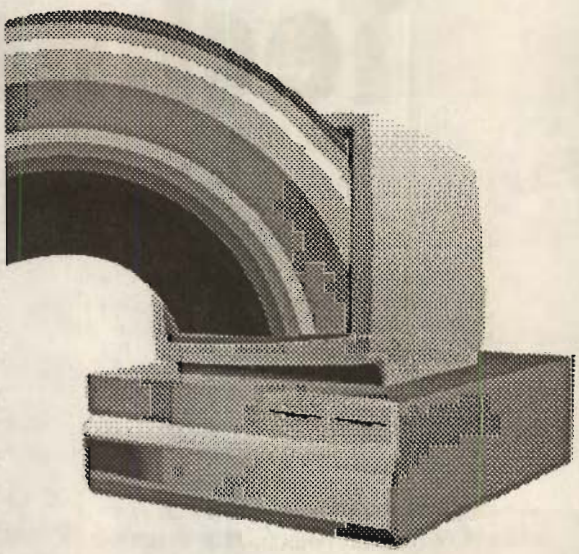
age and then uses one of the frame buffers for rendering the final 24-bit image. A 24-bit 3-D modeling, rendering and animation program called LightWave 3D also is included that must be seen to be believed. Finally, an eight-bit Alpha channel is used to blend or dissolve images between the two frame buffers as well as overlay keys. This is a lot of incredible technology all rolled together into one neat package.

The minimum configuration for using the Toaster is an Amiga 2000, one meg of chip RAM, and five megs of RAM. A more useful system would be an Amiga with a 68030 CPU and math coprocessor, a hard drive for image storage when using the two frame buffers, and at least seven megabytes of RAM. Any VCRs connected to the Toaster must be time-base corrected and, of course, all video sources must be genlocked and in phase with each other, just like any other video switcher. At this time the Toaster only will accept composite video inputs. The Toaster is currently not designed to work with the Amiga 3000. Also, since the Video Toaster is a composite video device, it does not display a 24-bit RGB image and its 16.8 million colors. It does, however, display several million colors, which is exactly what a television or video image displays.

The Firecracker 24 card from Impulse is a true RGB device in that it only outputs a red, green and blue signal. A genlock is required to encode the RGB signal and send out a video signal. Besides displaying all 16.8 million colors on your Amiga's monitor, the Firecracker 24 has a real-time 24-bit paint program. Unlike the Video Toaster's paint program, the Firecracker allows the user to see everything in real-time on his RGB monitor, without the need to send a rough version to a frame buffer for final rendering.

The Firecracker 24 was originally sold in one megabyte and two megabyte versions, with the two megabyte version working with higher resolutions (up to 1,024 horizontal pixels). Now only the two megabyte version is available at a list price of $1,000. Despite being released at approximately the same time as the Toaster, the Firecracker 24 is not necessarily intended for the same market. Because it is a true 24-bit RGB device, the Firecracker also can be used with film recorders for producing 35-millimeter slides and other applications where a pure RGB output is needed.

Included with the Firecracker is its own 24-bit paint program called Light. Imagine and Turbo Silver, the 24-bit 3-D programs from Impulse, also work with the Firecracker. A number of other software programs from various developers are being prepared as well. Note that the Firecracker will not work with an internal genlock. You must use an external genlock to encode a video signal. The Firecracker will work with all 2000 and 3000 series Amigas and fits inside one of the zoro slots, not the video slot. The Firecracker even can be used with an Amiga 500 using a Bodega Bay expansion box.



The HAM-E box from Black Belt Systems is a less-expensive way of working with RGB output from the Amiga. Two versions are available, the HAM-E and HAM-E Plus, at $300 and $430, respectively. The HAM-E Plus has a higher horizontal resolution (768 pixels) than the HAM-E (384 pixels). By using pixels that are half as small, and filling the gap between the smaller pixels with an intermediate shade of color for smoothing, the HAM-E Plus offers anti-aliasing for a small increase in price.

Both versions of HAM-E work in two color modes, one with 256 colors and the second with 262,144 colors. The second mode is sort of an advanced version of HAM without the usual color fringing and contouring problems normally associated with HAM images, thanks to the extra colors available. Like the Firecracker, internal genlocks won't work with the HAM-E. Again, you must use an external genlock to encode the HAM-E output into a video signal.

HAM-E comes with its own power supply and its own paint program. Also included is an image-processing program. While not in the same category as a Toaster or Firecracker 24, the HAM-E is a nice, low-cost alternative to working with millions of colors with your Amiga.

Perhaps because of its low price ($495), DCTV from Digital Creations is often compared to the HAM-E. While some of the comparisons are justified, the two are very different. For example, DCTV outputs a composite video signal. Unlike HAM-E, DCTV is also a slow-scan digitizer, digitizing still images in about six to 10 seconds. Like the HAM-E, DCTV has its own paint, digitizing and conversion software. The paint program is very nice, allowing for the smooth blending of colors as well as a very interesting feature that mimics painting with a watercolor brush (the color seems slowly to run out of the brush). The paint program alone is well worth the price of DCTV. The ability to display 24-bit animations using DeluxePaint III with images created with DCTV is another. When you add its digitizing capability and the included image-conversion software, this is a very nice package for the money.

You will need an absolute minimum of one megabyte of RAM to use DCTV, but three megabytes or more is highly desirable. One megabyte means working

with lower screen resolutions only and no spare page. At the time of this writing, the RGB converter necessary to allow DCTV to work with a genlock was still not available, so you will be limited to recording to videotape directly from DCTV.

Two other 24-bit products, the Video Blender from Progressive Peripherals and Software and the Colorburst from Centaur Software, were just starting to ship at the time of this writing. The Video Blender is essentially a high-end genlock that also allows for fading, mixing and wiping between the input video signal and Amiga graphics, as well as generating a color background, doing keys, generating a blackburst signal and mixing audio for $1,295. With all that capability, a more accurate description might be a two-channel video switcher. The Video Blender inputs and outputs a composite video signal, not RGB, so expect between two to four million colors being displayed.

The Colorburst has the potential for being a very exciting product thanks in part to its RGB nature and its ability to do wipes, dissolves and transitions between two 24-bit images that are stored in Colorburst's own 1.5 megabytes of video RAM. By using images with fewer bitplanes, up to 96 images can be stored in RAM for effects and animation purposes. Colorburst has its own real-time paint program called CBPaint. Since this is an RGB device only, you will need an external genlock to generate a video signal. The list price is $699.

One final 24-bit product was just on the verge of shipping. The Imact Vision 24 frame buffer from GVP promises to be a very powerful product. Besides being a 24-bit frame buffer, it is a composite and Y/C video genlock with transcoding between both formats, a framegrabber, and comes with its own 24-bit paint program plus a slimmed-down version of Octree's Caligari. List price is about $2,195.

All of these products give the Amiga user the ability to work with many thousands or millions of colors. Finally, professional-looking results that rival high-end systems costing much more are a reality. The hardest part may be deciding on which one to buy.

Avid Feature!

MORE SHOWMAKER™

A ShowMaker-Based Multimedia LAN

© 1991 by Michael Brown and Raymond McDonnell

In my introduction to this series of articles describing Gold Disk's ShowMaker (AVID, September 1991), I predicted that Ray and I would perform an in-depth review of ShowMaker in a three-part series of articles in which we mount our own multimedia production. We may have been overly optimistic. By the time we had laid out all of the software and hardware that we wanted to use in our production, we realized that three articles would not be adequate to perform the comprehensive review of ShowMaker that we intended. So, we consulted with Our Fearless Editor (aka Jim Plant) and decided to leave the length of this series open-ended for the time being.

The production itself will be a multimedia show chronicling significant developments in the Amiga's evolution--a multimedia timeline, if you will. The intent of our project, however, won't be as much to create a dazzling finished product as it will be to test ShowMaker's capabilities to control and coordinate a variety of production hardware and software. We envision building what you might call a multimedia LAN (Local Area Network) consisting of a variety of multimedia devices with ShowMaker functioning as the LAN's hub. This won't be, however, a LAN in the traditional sense of the word. We, for example, won't be able to exchange files between the systems on the LAN, but that's not important for our application anyway. What is important is that we will be able to control events on one system through events on another system. We anticipate that our multimedia LAN will be comprised of a Control System (the LAN's hub) and four sub-systems: a Video Switcher System; a MIDI System; a Multi-Purpose System; and a CDTV System. Because the Amiga can multitask, we may find that we will be able to use a single Amiga for more than one of these subsystems. Using a single Amiga for more than one of these subsystems, of course, would make the LAN simpler and less expensive. The production itself will be mounted using as much public domain and freely available material as possible. Again, the intent is to evaluate ShowMaker as a multimedia production tool and to describe how the various elements of an Amiga-based multimedia production work together. In the process, we'll also review several pieces of multimedia hardware and several other software packages--some new and some not so new. Given the complexity of both the topic and the system, we fully expect to encounter some pitfalls along the way, but we also expect to discover some pleasant surprises. In any event, we expect to have a good time and hope you will, too.

The Control System of our multimedia LAN will be quite complex. It will feature multiple Amiga systems, a Video Toaster, MIDI sequences and instruments, a public address system, camcorders, timebase correctors, videotape recorders and a host of Amiga software. In this installment, we'll introduce the Control System, the four subsystems and the basic components in each. Next month, we'll explore how the systems will be connected and integrated and will cover such topics as equipment, communications, cabling and ARexx along the way.

System 1: System Control

System 1 will be used to run ShowMaker and will function as Master Controller for the three subsystems on the network. We'll also use it as a display system for non-Toaster images (DCTV and DPaint images, for example) and for playback of Amiga audio samples. System 1 will consist of an Amiga 2500 with a 40-megabyte hard drive and a SyQuest 88 megabyte removable media hard drive.

It will have three megabytes of 16-bit memory and four megabytes of 32-bit memory. The system will have a Commodore A2286 Bridge Board, a Truevision Targa + videographics adapter, an ASDG dual serial board, an ECE MIDI interface, an Interactive MicroSystems MediaPhile system, a Digital Creations DCTV system, a Digital Creations SuperGen and a NewTek Video Toaster.

We've included the 286 BridgeBoard and the Truevision Targa+ board because we may decide to use Caligari Broadcast to model, render and animate some objects and to demonstrate the Amiga's capability to use graphics and 3-D objects from different computer platforms. We've included the Video Toaster in this system to test ShowMaker's ability to control a Video Toaster installed in the same host computer. We will remove it to test ShowMaker's ability to control the SuperGen. A dual serial board is required to simultaneously control a stand-alone Video Toaster and a MIDI system. We'll use the MediaPhile system to control one or more VTRs and infrared devices.

Primary software installed on System 1 will include ShowMaker itself, ARexx (for communications between the systems), Bars & Pipes Professional (for music composition and playback), Deluxe Paint III, Caligari Broadcast 2.0, Audition IV (for sound sample editing and playback), DCTV's software, the Video Toaster's software, The Art Department (for image conversion) and the IMS MediaPhile software (for VTR and other hardware control).

System 2: Video Switcher

System 2 will be used as a video switcher, video display board, frame capture board and character generator. It will consist of an Amiga 2500 with an 80-megabyte hard drive and a SyQuest 88-megabyte removable media hard drive. It will have three megabytes of 16-bit memory and four megabytes of 32-bit memory. Because of the processor and memory requirements of the Video Toaster, this system will be configured as a stand-alone Toaster workstation. The primary software, therefore, will be the Video Toaster's software and ARexx, for communications with ShowMaker (running on System 1).

System 3: Multipurpose System

Purpose: Our multipurpose system will be used for MIDI control, audio sampling and to provide infrared control over media hardware (VTRs, cassette decks, CDTV, etc.). Since no one has yet introduced a device to add serial ports to the A500 (we ran out of A2000s!), we'll use MIDI both to control this system and to use this system to control other nodes on the LAN.

Our Amiga 500 will have two floppy disk drives, one megabyte of memory and an ECE MIDI interface. Primary software to be used on System 3 will be Geodesic Publication's AirLink 2 (for infrared control), ARexx, Bars & Pipes Professional (player module only) and SunRize Industries' Perfect Sound audio sampler and Audition IV sample editor. Note that we will use this system to sample sounds and edit them, but playback during the production will be performed on System 1.

System 4: MIDI Sequencer

System 4 will not be an Amiga system at all, but a Roland PR100 stand-alone MIDI Sequencer. We've included this piece of hardware in the system for two reasons. First, we wanted to test controlling ShowMaker's ability to be controlled by an external MIDI clock. Second, we wanted to demonstrate that if you have MIDI capabilities on another platform (Atari, IBM, Macintosh or a stand-alone sequence such as the PR100), you can use MIDI to control ShowMaker productions without having to learn how to use another sequencer.

System 5: CDTV

When Commodore rolled out CDTV, the company made quite an effort to dispel the notion that this machine was in fact a computer. As the first real ad campaign for the product emerges, however, we see that Commodore has had a change of heart. One of the ads reads, in part, that CDTV "can be expanded to a full Amiga Computer System." Why have we included CDTV in our multimedia LAN? As an experiment, really. We wanted to see what we could accomplish with this new technology. CDTV has more storage capacity, albeit in read-only format, than any other Amiga system; it's the first Amiga system to have built-in MIDI ports; and it supports both the CD + Graphics and CD + MIDI formats. We think that's a lot of multimedia potential.

Conclusions

To our knowledge, the ShowMaker-based multimedia LAN that we've just outlined doesn't yet exist. To prove that this isn't just an interesting theory, therefore, we're going to build such a system and thoroughly test it by using it to mount our own multimedia production.

A Few Words on Music in Multimedia Productions

We consider music to be one of the most critical elements of a multimedia production. We have decided to compose original music for this production. Why? There are several ways to avoid becoming entangled in a legal dispute over copyright issues when using music in a multimedia production. The easiest, least expensive method is to use music that is in the public domain, but you may have difficulty finding the music that's "right" for your production. You can license someone else's music, but that requires money. You can commission someone to write music specifically for your production, but that can be quite expensive and typically requires some lead time. The method we have chosen is to write our own music (or, more accurately, to have Ray write it).

While MIDI music libraries are readily available from a variety of sources (Blue Ribbon Soundworks, for example, offers an extensive library) and Amiga SMUS files can be translated into Bars & Pipes format (from which they can be further translated into MIDI File Format for use with other sequencers), the use of copyrighted music is strictly governed by copyright law and you must be very careful about using any copyrighted material. By composing our own music, we can get exactly what we want with no financial outlay and no worries about legal hassles.

cont➤

The SHOWMAKER™ LAN

System 1: System Control

Purpose: To run ShowMaker as a Master Controller for the three subsystems on the network, to display non-Toaster images and to play Amiga audio samples.

Configuration: Amiga 2500 with: 40-megabyte hard drive, 88-megabyte SyQuest removable media drive, three megabytes 16-bit memory/four megabytes 32-bit memory.

Hardware Add-ons: ASDG Dual Serial Board, Commodore A2286 Bridge Board, Digital Creations DCTV, Digital Creations SuperGen ECE MIDI interface, Interactive Microsystems MediaPhile, NewTek Video Toaster, Truevision Targa + video adapter.

Primary Software: ARexx Art Department Audition IV Bars & Pipes Professional, Caligari Broadcast 2.0 DCTV, Software Deluxe Paint III, ShowMaker Video Toaster Software.

System 2: Video Switcher

Purpose: Video switching and display output, character generation and frame capture.

Configuration: Amiga 2500 with: 80-megabyte hard drive, 88-megabyte SyQuest removable media drive, three megabytes 16-bit memory/four megabytes 32-bit memory.

Hardware Add-Ons: Video Toaster (configured as a stand-alone workstation)

Software: ARexx Video Toaster software

System 3: Multipurpose System

Purpose: A MIDI host system, audio sampling (not playback), and to provide infrared control over one or more infrared devices (VTRs, audio cassette decks, CDTV, etc.).

Configuration: Amiga 500 with: single floppy disk drive, one megabyte RAM

Hardware Add-Ons: ECE MIDI Interface, Geodesic Publications AIrLink 2 Perfect Sound Audio Sampler

Software: AirLink 2, ARexx, Audition IV, Bars & Pipes Professional

System 4: MIDI Sequencer

Purpose: Primarily to test controlling ShowMaker with an external MIDI clock and demonstrate that if the producer has existing MIDI capabilities on any other platform (Atari, IBM, Macintosh or a stand-alone sequence such as the PR100), you can use MIDI to control ShowMaker productions.

Configuration: Roland PR-100 MIDI Sequencer

Hardware Add-Ons: N/A

Software: N/A

System 5: CDTV

Purpose: Experimentation. CDTV has more storage capacity, albeit in read-only format, than any other Amiga system; it's the first Amiga system to have built-n MIDI ports; and it supports both the CD + Graphics and CD + MIDI formats.

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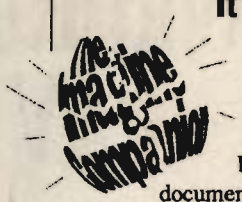

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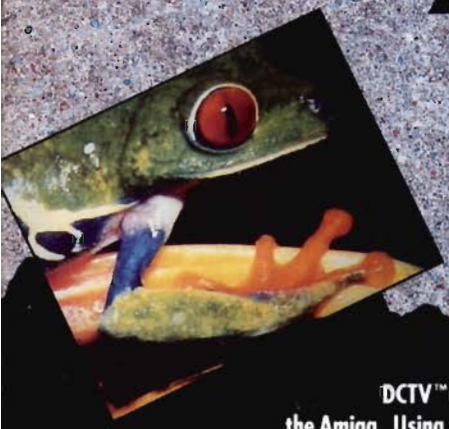

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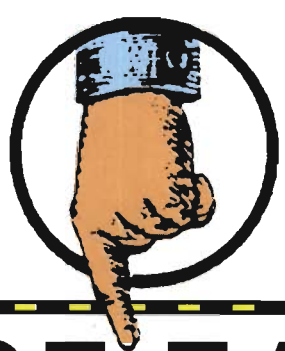

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