THE PERSONAL VIDEO PRODUCTION MAGAZINE

VIDEO TOASTER® USER

an avid publications magazine

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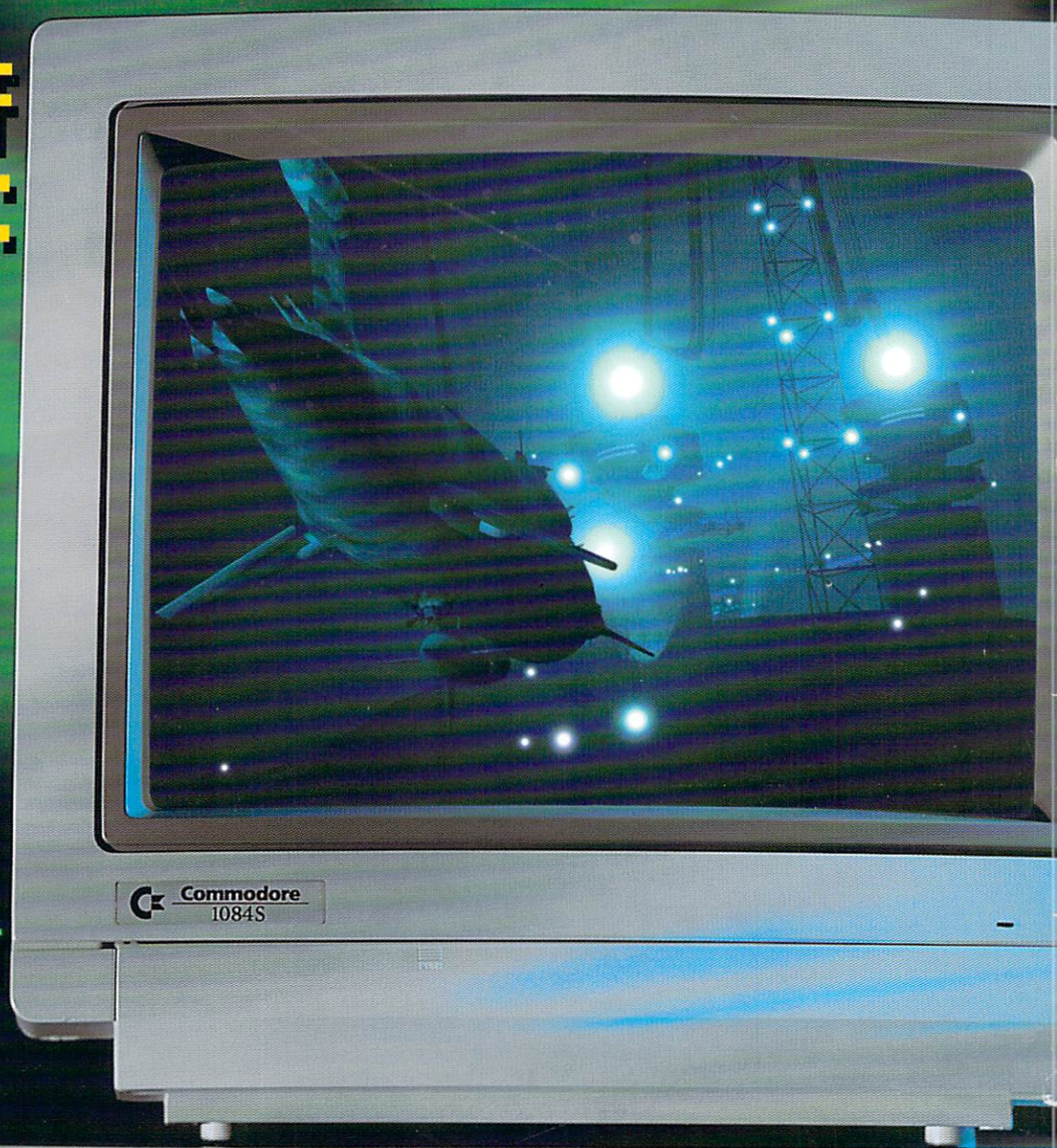

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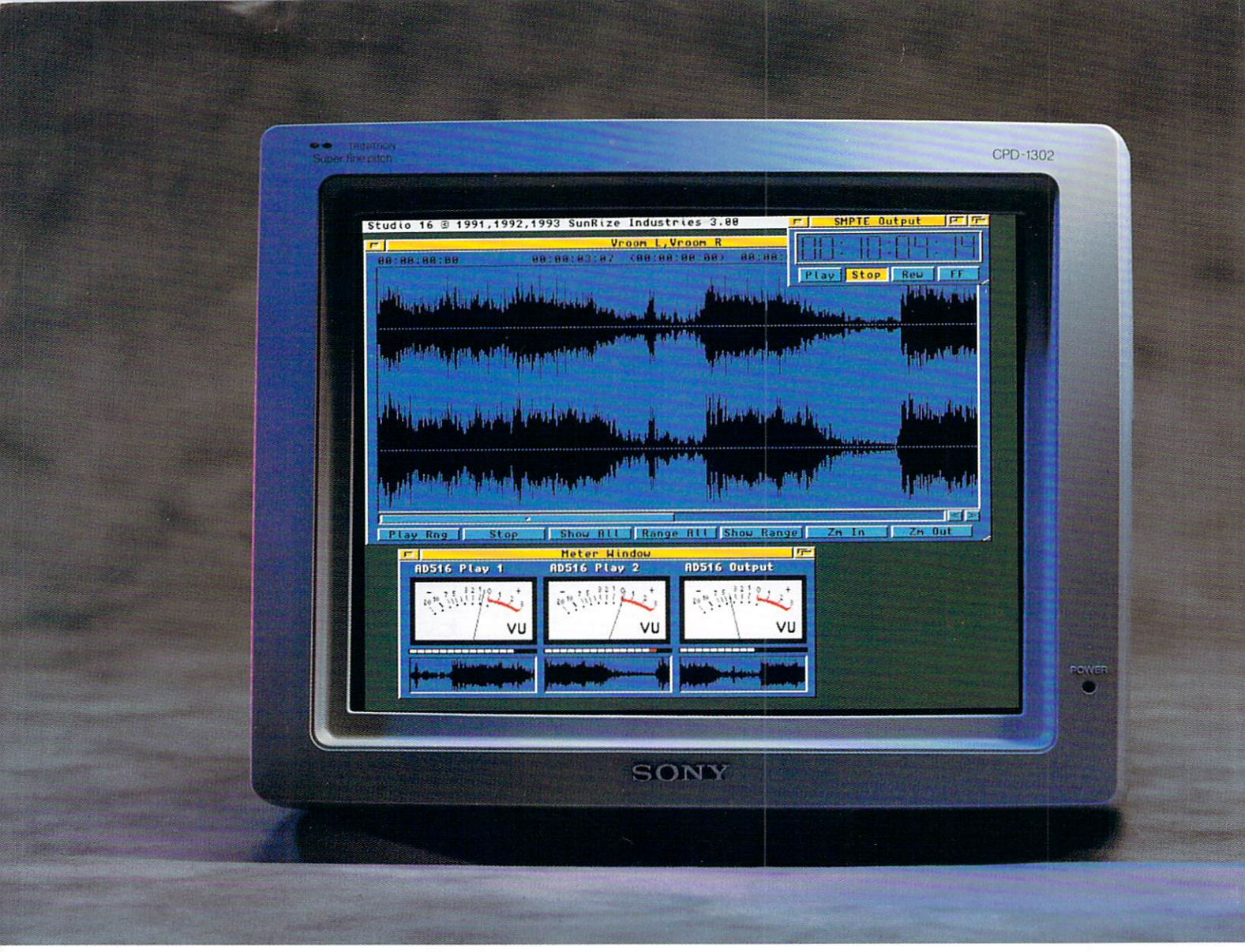

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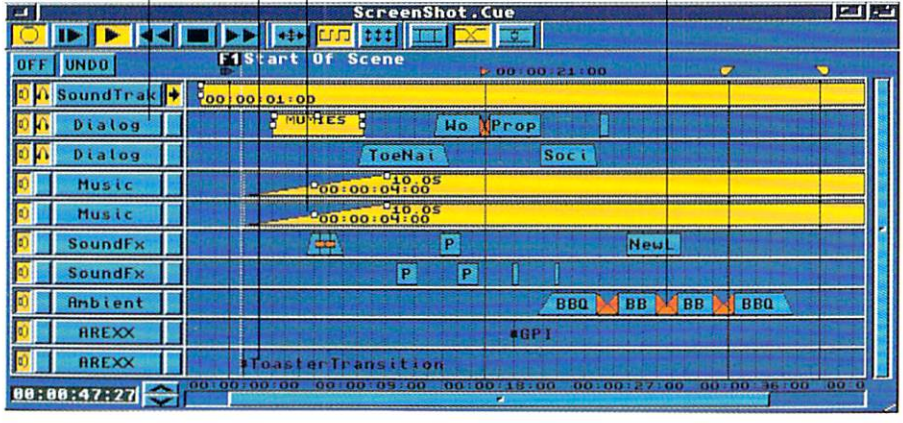

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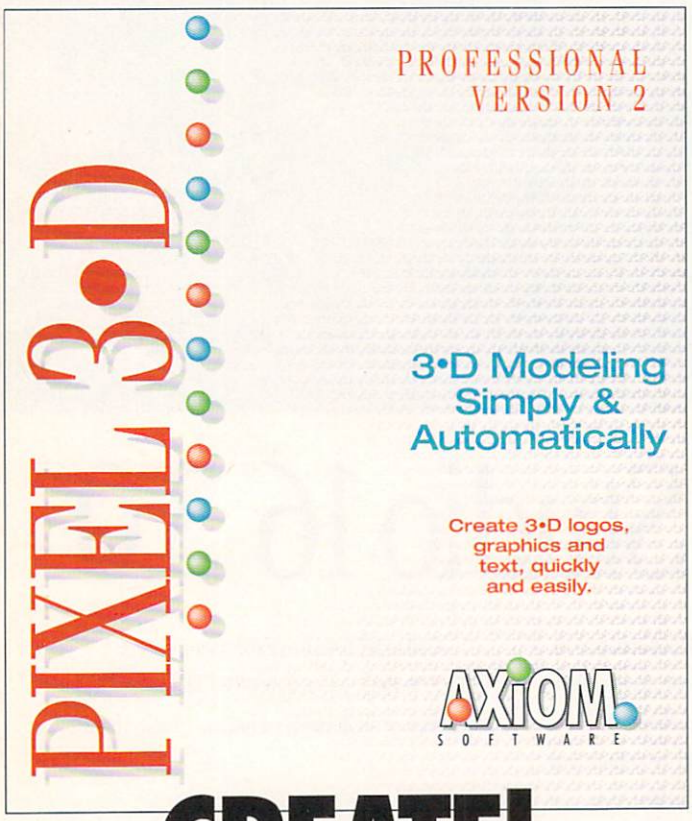

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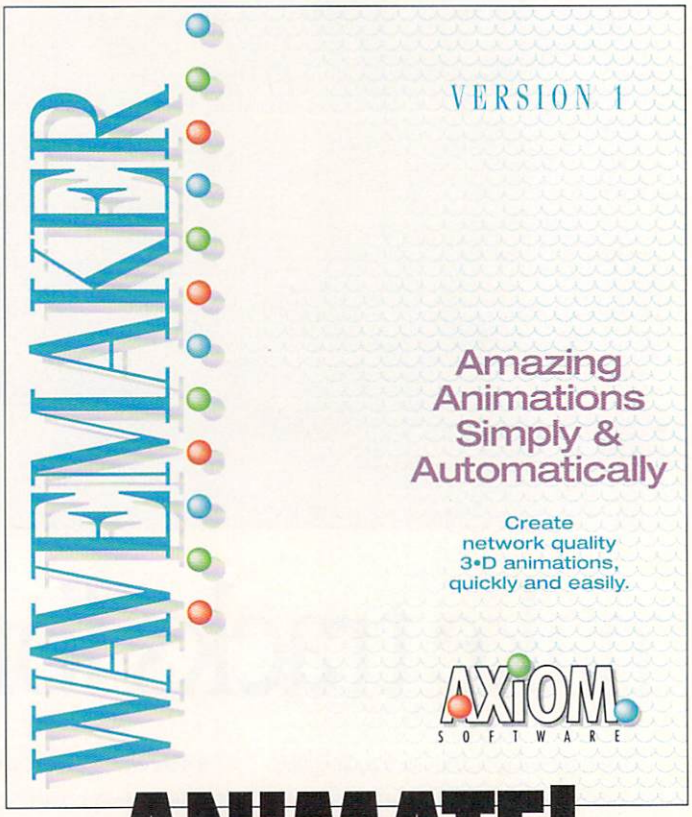

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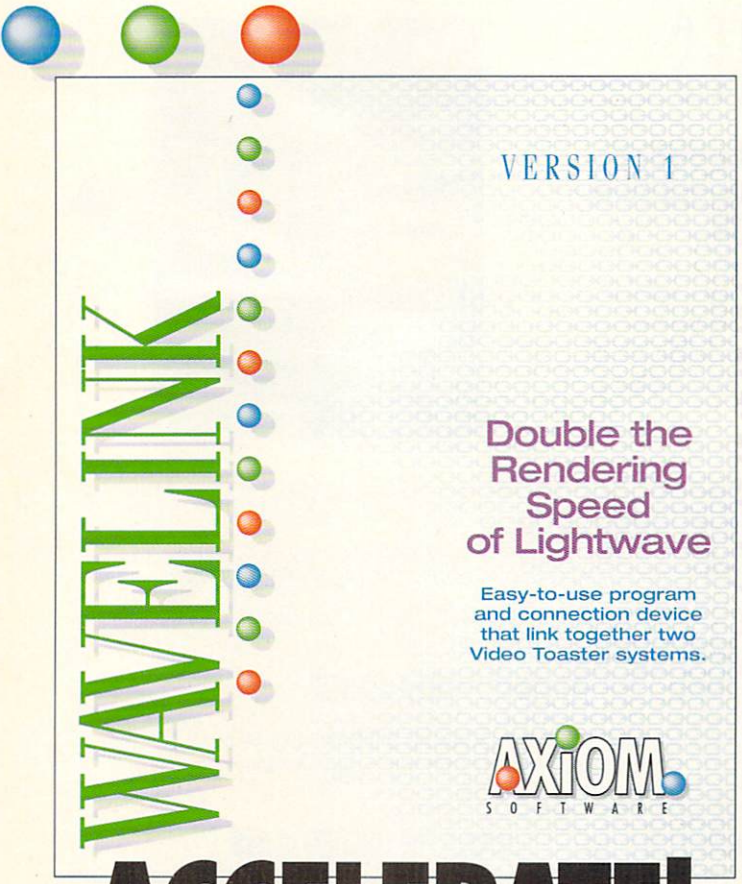

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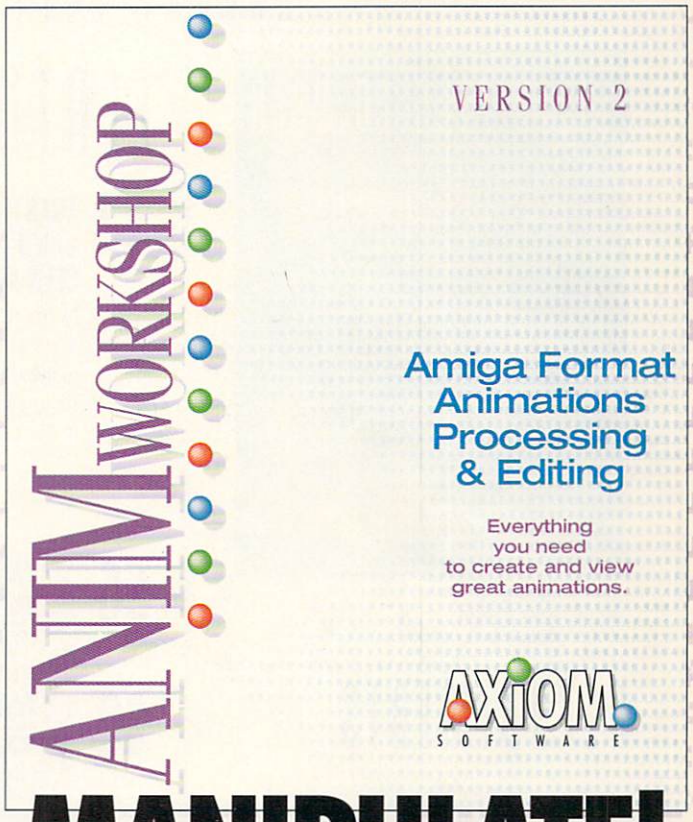

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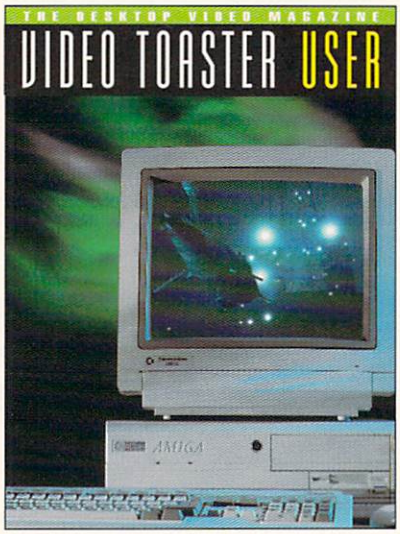

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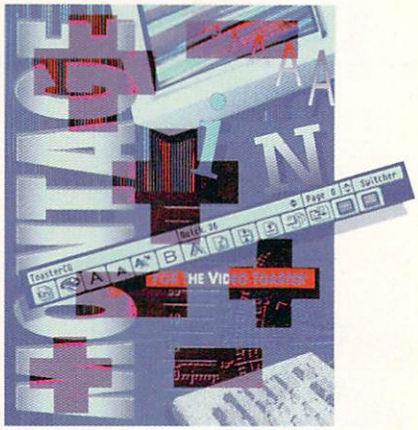

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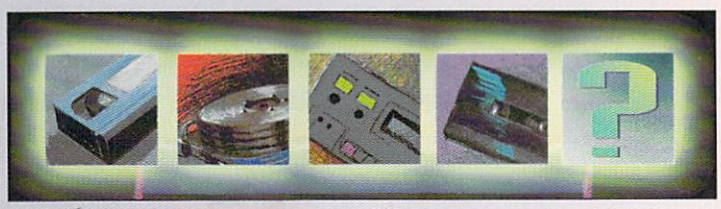

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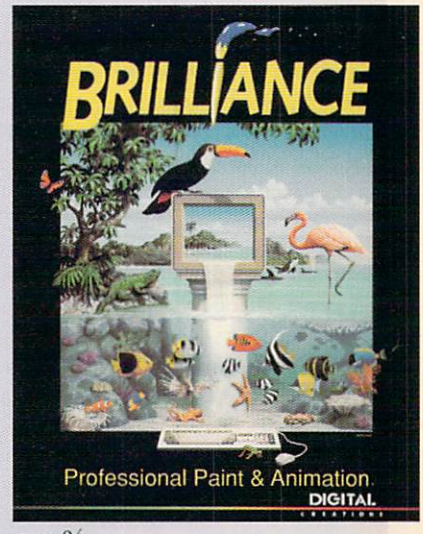

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Publisher's Letter

The January 1994 issue represents a big step for *Video Toaster User* magazine. After almost two years of bi-monthly publication, we are responding to reader's demands for more frequent Video Toaster and personal video production information by publishing *VTU* on a monthly basis. Considering how difficult it has been to produce the magazine every two months, and the recent launch of the *LightWavePRO* newsletter, it is more than a little frightening to think about doing a greater amount of work in half the time. Fortunately, we've been anticipating this change for quite some time, and we've made several personnel additions and workflow changes to meet this new challenge. That you are holding this magazine in your hands is testament to the fact that this team is up to the task! I would feel ungrateful if I did not take this opportunity to publicly thank all the members of the Avid Publications team for cranking up the volume when things got hairy.

The heat has also been turned up on the members of the staff that are not directly involved in magazine production. Mike Ingoglia, a recent addition to the Avid Publications staff, has been hard at work overseeing the design and production of the "new and improved" *Video Toaster User* Keyboard Overlay (see the ad on page 115 for upgrade and order information). As the director of ancillary products, Mike is also responsible for the production and distribution of *LightWavePRO*, as well as the upcoming publication of Burt Wilson's new book on using the Toaster in "real-world" situations. As you can see, Mike has his hands full.

Another busy staffer is Ann Pulley. As our events coordinator, Ann is responsible for the planning and logistics for the Lee Stranahan "Toaster Across America" tour, as well as our "Toaster Training in Paradise" special events. As of this writing, Lee has made stops in over 30 cities and in January and February is headed west to California, Oregon, Washington, British Columbia, Utah and Colorado.

On the heels of a very successful training conference in Hawaii, Ann is hard at work organizing the next "Toaster Training in Paradise" scheduled for February 22-25 in Bermuda. This will be a four-day conference with an even greater choice of classes. Trainers will include John Gross, Ken Stranahan, Rex Olson, Tony Stutterheim and, of course, Toaster expert extraordinaire, Lee Stranahan. Give Ann Pulley a call at 800-322-2843 for more information about "Toaster Training in Paradise" in Bermuda and for specific "Toaster Across America" dates and times in your area.

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Publisher

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Direct your Toaster-specific questions to John Gross. Direct your general video questions to Rick Lehtinen. Send your tips to Brent Malnack.
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Specific product information or press releases should be sent to the Managing Editor by mail or Fax 408-774-6783.
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If you are interested in writing an article for Video Toaster User, send a written request for our writer's guidelines (include your telephone number and subjects that you are prepared to write about) and include a self-addressed stamped envelope. Direct your inquiries to Writer's Guidelines.

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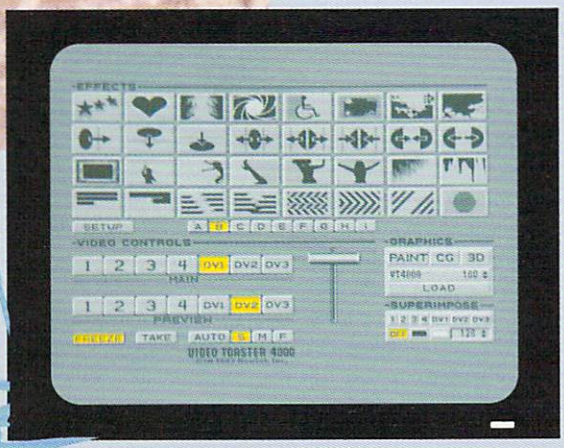

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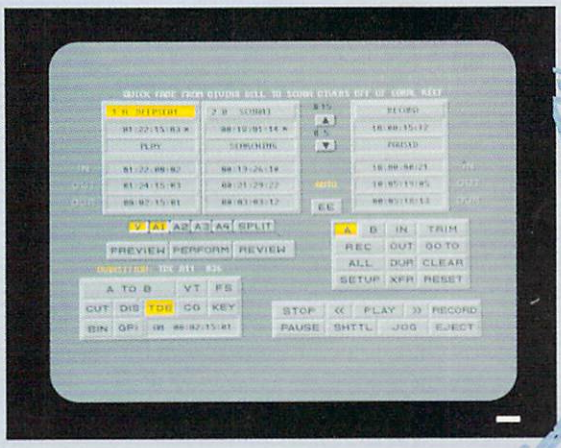

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TOASTER TALK

Beaucoup Bandwidth

Don't Get Too Excited Yet

By Phil Kurz

1994 marks an historic opportunity for video communications in this country. The inauguration of the Hughes DirecTV and Hubbard Communications direct broadcasting service this year means that literally hundreds of new, unprogrammed channels will become available.

The expansion of regional telephone companies into the video distribution business and cable television's own system upgrades promise still more channels.

Coinciding with the growth in the number of TV channels is the availability of low-cost, high-quality video production equipment, such as the Video Toaster.

Many look at these parallel advances in video production and transmission technology and assume that the former will feed content to the channels created by the latter. I'm not so sure.

Flash Back

Ten years ago, I worked as a copy editor in the international department of the Yonhap News Agency while finishing my master's thesis. The goal of my thesis was to explain how the South Korean government under president Chun Doo-Wan controlled the flow of information to its citizens by manipulating the press.

Although the specific measures Chun used aren't relevant to our experience in the United States, I believe one thing I learned about the South Korean press during my year in Seoul is. When the media are structured, they are easily controlled. In an authoritarian regime, such as that of Chun, control can be overt—outright censorship, the chilling effect of government agents in the newsroom or a career track that leads top press management to cushy government jobs as long as they don't rock the boat.

In a country where the First Amendment of its Constitution guarantees all citizens the right to free speech and a free press, such government strong-arm tactics are unacceptable.

However, there is a recognizable structure to the ownership and operation of the media in the United States. Those in government have learned to use this structure to their benefit and manipulate the press to maximize their chances of achieving their desired ends.

Thus, we see presidential press handlers stage events for the sake of creating pretty pictures and delivering planned sound bites. We also see an entire protocol evolve to manage how presidential press conferences will be conducted. If you doubt it, watch the next presidential press conference. The first question President Clinton will take will be from the Associated Press reporter. Whose next? Why UPI's Helen Thomas, of course.

Whether or not this sort of operational structure is bad depends upon your point of view. If you are in the press, it's not because it makes your job easier. If you are in government, it's not because it makes the media more predictable and thus easier to manipulate. But if you're a citizen of the country trying to decipher the president's plan for health care, the North American Free Trade and Finance Agreement or some other complicated issue, this operational structure—by virtue of its ability to be easily manipulated—can prevent you from getting the truth.

Ownership

By virtue of there being recognizable owners of media outlets, government has easily identified targets for its policies aimed at controlling media content. Thus, Senator Paul Simon (D-Ill.) can aim his campaign against media violence at the television and movie industries—known and recognizable quantity. He leads the charge, and the industries give in.

The executive branch hasn't missed its opportunity to take aim at a recognizable media voice, either. To date, the Federal Communications Commission has levied more than $1 million in fines against Infinity Broadcasting and radio stations carrying the syndicated *Howard Stern Show* for Stern's alleged indecencies.

How can Simon and other legislators propose that laws be passed to limit speech when the First Amendment explicitly states: "Congress shall make no law..."? How can a federal agency like the FCC mete out fines to punish Infinity and by extension Stern for something the shock jock said?

The short of it is that the FCC's pretext for regulating broadcast speech is purely technical. In the early days of radio, when stations stepped all over each other's signals, the government took action to bring order to the airwaves and assigned channels.

The justification for the government's authority to regulate this new media—and therefore regulate speech—was that bandwidth was a limited public resource. As such, the government would grant licenses to only those who would serve the public interest.

That might have made sense in an era of crystals, tubes and analog transmission, but this is 1994—the era of digital communications. These new DBS and telephony-based video and audio services will be digital, and they will be compressed. In fact, there will be so many channels available thanks to digital compression that the pretext upon which the FCC has justified its very reason for being comes into question.

Once hundreds of channels are available, can anyone honestly believe that the limited spectrum argument justifying government regulation of broadcast speech will be valid?

Don't Rejoice Yet

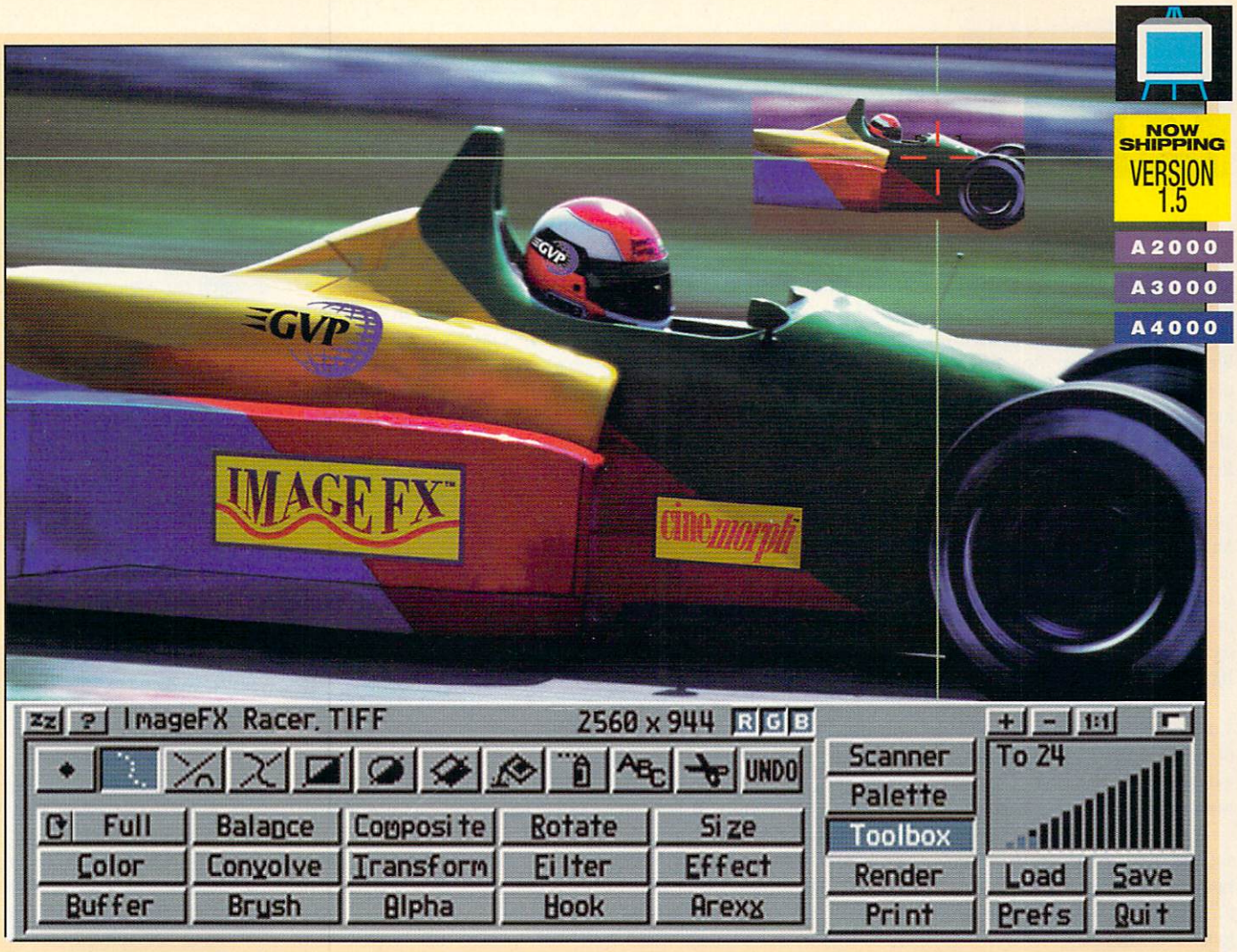
When taken together DBS, video telephony and fiber optic cable service promise to shake up the media status quo in an unprecedented way.

Those personal video producers who believe that these new services will automatically give them access to an outlet for their message must be viewing the world through rose-colored glasses.

To think the regulators will go down without a fight would be unwise. To believe that the press will gladly embrace new, unknown forces that promise to grab part of their turf would be naive.

If personal video producers are to benefit from the revolutionary changes in communications technology to be unleashed this year, we must stand up now and stake our claim. We must encourage and support those entrepreneurs among us who will organize channels filled with the work of our personal video producers. We must fight for access to these channels and produce work every bit as good or better than normal television fare. And above all we must not miss any opportunity to point out and protest the government's encroachment upon our constitutionally guaranteed right to freedom of speech.

VTU



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GREAT VALLEY PRODUCTS, INC.• 657 CLARK AVENUE, KING OF PRUSSIA, PA 19406 USA
PHONE 215•337•8770 • FAX 215•337•9922

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Circle Reader Service No. 125

LETTERS TO THE EDITOR

Dear VTU:

In your August/September issue, you promised a copy of NewTek's new "Beyond Revolution" demo tape to respondents of a survey. Well, it is well over two months now, and I was surprised to see you had not kept your promise. After all, it wasn't my idea to ask for a free tape. You made the offer.

At least I was until I purchased your October/November issue. Ahhh, suddenly it all became very clear. Obviously, you have no time to keep a promise when more important things, like big "seminars" (parties) in Hollywood and Hawaii occupy your time.

You have often stated how the Video Toaster will bring the power of video to the common man (or woman), but it's pretty obvious where your real priorities are.

Well, as you continue in your success, just remember, the corporate graveyards are full of "successful companies" who took their customers for granted.

Sincerely,
Dave Matthews
1006 West 2nd St.
McCook, NE 69001-2511
(308) 345-5884

Editor responds:

The "Beyond the Edge" videotape began shipping in early November to those who replied with the card enclosed in the issue. If you have ever produced a videotape, you know that it takes time to make sure things are right. I believe that by the time you read this in the magazine you will have had the videotape for more than a month.

As for the NewTek party at SIGGRAPH and the Hawaiian training, I must ask: Are you serious? How many words do you think are in the typical issue of *Video Toaster User*? Do you seriously believe we have the time to party in Hollywood with NewTek or vacation in Hawaii? If so, write me a follow-up letter. I need a vacation.

Dear VTU:

Is it just me, or is the Amiga starting to appear everywhere I look? I see Amiga-generated graphics on television, in movies and now even in sports stadiums. But that doesn't do the Amiga any good: I know they are using the Amiga, while most people don't. That is why I have begun compiling a list of places that use Amiga computers. I want people, who don't take the Amiga seriously, to be able to look at my freely publishable list and say, "Wow, I didn't realize that WAXY channel 52 uses Amigas!"

While my list is definitely growing steadily, there are a few areas that are lacking. I have very few specific TV stations that use the Amiga and very few TV programs for that matter. I would like to ask the Amiga community to help in finding professional Amiga users out there. I promise to publish any verifiable lead when I can find. I kindly ask that anyone who is associated with an independent or network TV station send me information, such as a letter from the graphics department of a station, proving that the Amiga is in fact used. Enclosed, is a complete list of all known professional Amiga uses. Hopefully this the beginning of a rather lengthy list!

Also, I need a list of people and places to send this to! All magazines, newspapers, TV stations, etc., are greatly appreciated!

Sincerely,
David Tiberio
President of Area52

Editor responds:

I appreciate your enthusiasm but must urge you to reconsider how you spend your spare time.

Dear VTU:

The "Church Lady" notwithstanding (Dana Carvey, *VTU* Oct/Nov '93), as a Christian chaplain and a videographer, I see tremendous potential in the Toaster for communicating the gospel. LightWave 3D will make possible the rendering of images that will portray Biblical events and concepts as nothing has before. Hollywood's interest in portraying the gospel message accurately and positively has been negligible—especially in recent years, so many of us in the ministry welcome Toaster technology as a God-send. I hope to be able to afford one someday—and put this wonderful and powerful tool to a lofty use!

Sincerely,
Chaplain Jack R. Johnson

Dear VTU:

We noted with surprise and dismay the absence of any reference to the Future Video range of edit controllers in the *VTU Buyer's Guide* of your otherwise excellent June/July '93 issue. This particularly puzzling since we have advertised our EditLink 3300 series A/B Roll edit controllers to Toaster users in each of the previous two issues of *VTU*.

Your readers may be pleased to learn that our award-winning range of desktop video edit controllers provide unprecedented +/-1 frame accuracy using SMPTE time code with "prosumer" and low-end industrial VTRs. Selected VTRs fitted with the Panasonic 5-pin, Sony Control-L (LANC), Sony VISCA, and RS-232C machine control protcols are compatible.

Our EditLink 3300 series controllers include multi-tasking A/B Roll software for the Amiga, in addition to IBM and Mac diskettes. A special cable to trigger the Toaster's GPI is also included with each EditLink 3300. Prices range from $1,295-$1,795, software diskettes for all three computer platforms inclusive. Our EditLink 2000-DT (2 VTR control) series and EditLink 3300 series (3 VTR control) controllers are also compatible with an exciting third party Amiga software package for videotape editing called CyberEdit (Cybercall, Inc. 908-249-9883).

Best regards,
Stephen E. Godfrey
Vice President
Future Video Products, Inc.

Editor responds:

Thank you for bringing our readers up to speed on Future Video products. Our records show we repeatedly requested product listing information from Future Video when putting together the directory but received no reply. In the magazine business as in television, the show must go on; thus, your company was omitted.

As for being puzzled about the omission because you advertise, I want you and the readers to understand that advertisers do not receive preferential treatment in our stories, columns and other editorial product. We try to keep the playing field level and will cover products objectively regardless of whether they are advertised.

Corrections:

In the October/November 1994 issue, New Products department, we incorrectly stated the product name and information under the heading *Fast SCSI-II Controller*. The following is the correct product name and information:

Product: Fastlane Z3
Description: Fast SCSI-II DMA Controller for the Amiga 4000
Price: $599
Advanced Systems & Software
1329 Skiles St.
Dallas, TX 75204
Phone: (214) 239-2000
Fax (214) 821-3464

The Fastlane Z3 Fast SCSI-II DMA Controller for the Amiga 4000 features a Fast SCSI-II controller with 32-bit DMA access as well as 32-bit wide memory expansion up to 64 MB on one full-length Zorro-3 slot card. The SCSI controller offers transfer rates of up to 7 MB/sec (asynchronous) and 10 MB/sec (synchronous) on the SCSI bus.

100% DIGITAL.... 4:2:2 THROUGHPUT.... INTEGRATED PROC AMP.... UNDER $ 1000

SATISFIED? WE WEREN'T!

Following GVP's philosophy of complete feature integration pioneered by our **G-Force Combo**™ accelerators (used in a majority of Amiga® Video Toaster™ Workstations), we are proud to present a professional TBC with time and money saving features.

You would demand a TBC to be 100% digital, have 4:2:2 throughput, and an integrated ProcAmp. You would want it to be under $1,000. We agree. What does the Plus get you?

Plus – Real-time 16.7 Million Color Frame-Grabber/FrameBuffer for use as a digital video stillstore or signal generator. Included ImageFX™ modules allow direct editing and manipulation in the framebuffer.

Plus – Full Transcoding between Composite and Y/C (SVHS) Input and Composite and Y/C (SVHS) Output.

Plus – Real-Time Professional Special Effects Generator featuring solarization, strobing, pseudo-color, monochrome effects, and more.

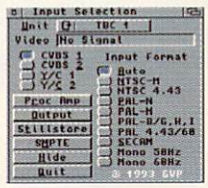
Plus – NTSC/PAL/SECAM Signal Standards Conversion to NTSC/PAL for integration into worldwide video environments automatically.

Plus – Complete Amiga Software Control and ARexx™ Interface that allows seamless integration of all **TBCPlus** features into an exisiting automated video studio installation.

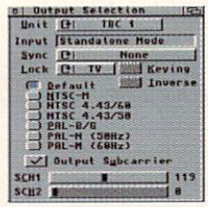
TBC Plus™

Plus – Full Processing Amplifier (ProcAmp) Control for correcting or adjusting incoming video "on-the-fly" quickly and professionally.

Plus – 3 inputs (2–composite, 1–Y/C) that can be connected simultaneously and 'Hot-Switched' with software without having to play with cable connections.



Plus – Convert the 2–composite inputs into a single Y/C input, providing two switchable Y/C inputs.

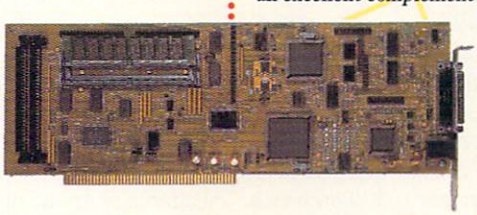


Plus – Full SMPTE/EBU encoding/decoding/striping available as an option.

Plus – much, much more!

"This is simply the most powerful and flexible video stabilization device for the Amiga computer. The TBCPlus makes an excellent complement to any GVP IV24™, NewTek Video Toaster™, or Centaur OpalVision™ Graphics System. The Plus means it also offers more!"

Gary Gehman, President
Magic Bullet Communications, Inc.



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Circle Reader Service No. 125

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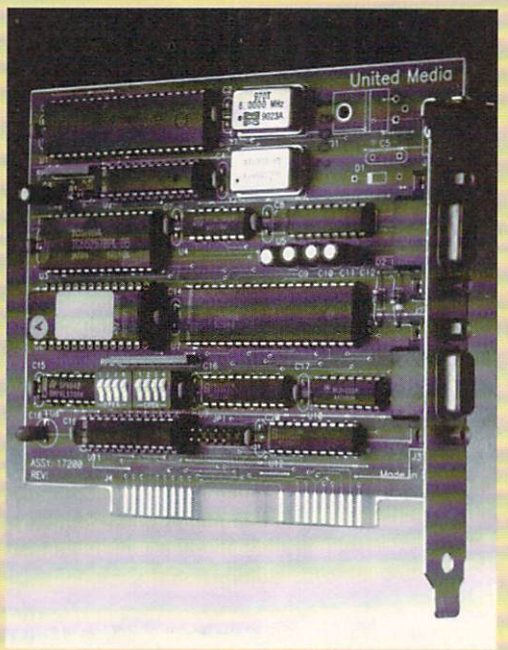
NEW PRODUCTS

Compiled by Josh Moscov

VAC-100

Series Single Frame Animation Controllers

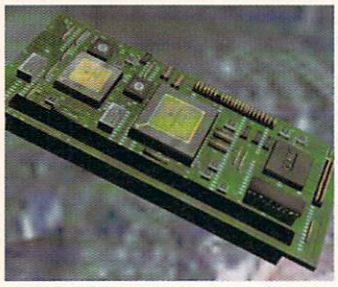


Product: VAC 110, 120 and 130
Description: Single plug-in circuit boards that interface with the Amiga and Toaster.
Price: $499-$895 depending on model.
United Media
4771 E. Hunter
Anaheim, CA 92807
(714) 777-4510
Fax (714) 777-2434
Circle Reader Service No. 1

United Media has developed the *VAC 100* Series of animation controllers that give the user full control of VTR/video device operation and editing functions at the computer keyboard. These single boards replace costly LAN hardware (both transmitter and receiver) by offering a direct RS-422 plug-in alternative. The *VAC-130* is compatible with both Amiga and PC platforms.

Amiga Accelerator

Product: Afterburner A4050/030
Description: The first 50Mhz 4000/030 accelerator.
Price: not available
Eureka
Kapittelaan 124 6229 VR Maastricht
The Netherlands
043-61 3743
(Fax) 043-61 9077
Circle Reader Service No. 2



Eureka's *Afterburner*—a DM 846 high-speed Motorola 68030-based accelerator card for all Amiga 4000/030 computers—is promoted as having twice the speed of the A4000/030 and 22 times faster than a stock A2000. Its burstable memory interface and optional "local bus" RAM more than doubles the performance from the original RAMs. Local bus RAM can be expanded an additional 525 MB. Auto installation configuration software is included.

Amiga Online Reference Manual (AORM)

Product: Volume 2
Description: Amiga Guide hypertext software that provides current user information.
Price: $34.95
Area52
107 River Park Dr.
Liverpool, NY 13090
(315) 622-2173
Circle Reader Service No. 3

The *AORM* is an online reference manual designed to aid the entire Amiga user population, whether new or seasoned. It contains glossary words and over 200 answers to commonly asked questions; information on Workbench 3.0 is included. With all of these new features, the company decided to produce AORM with under 3kB of space on the distribution disk.

Simkat Fonts

Product: Ethnic Fonts
Description: Middle Eastern Alphabet Fonts for the Amiga.
Price: $100.00
L.C.P.S. Inc.
P.O. Box 2015
Schiller Park, IL 60176
(708) 678-7183
Fax (708) 678-7223
Circle Reader Service No. 4

Until recently, most Amiga foreign-language fonts have focused on characters from Latin-based languages, but L.C.P.S. has introduced *Ethnic fonts* from the Semitic and Arabic alphabets for video titling, paint programs, and special graphic applications. Fully compatible with the Video Toaster, the packages include characters from Arabic, Persian (Farsi), Assyrian (Syrian), and Hebrew languages.

Video Deck Controller

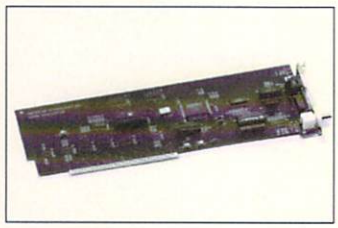
Product: 3.0SP Multimedia Controller
Description: Computer edit controller of industrial and prosumer video decks.
Price: $995.00
Interactive MicroSystems
9 Red Roof Ln.
Salem, NH 03079
(603) 898-3545
Fax (603) 898-3606
Circle Reader Service No. 5

The Interactive MicroSystems *3.0S* can control editing on up to six industrial and prosumer video decks. Six audio time code inputs provide near frame accurate editing with the decks. In addition, the four serial ports and six GPI switch outputs provide switcher, SEG, and MIDI control for special effects. The Toaster is controlled for A/B-Rolls, special effects and title overlays.

Ethernet Card for the Amiga

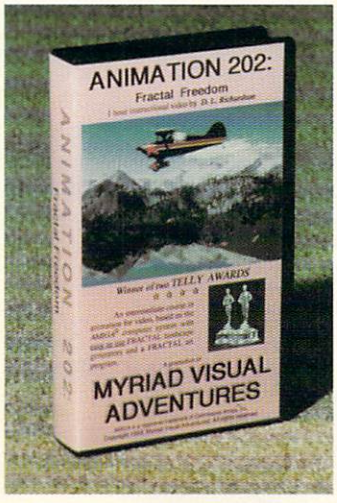
Product: A2066 EthernetPLUS
Description: A host interface increasing CPU access performance by 25% over other EtherNet products.
Price: $349
Ameristar Technologies
47 Whittier Ave.
Medford, NY 11763
(516) 698-0834
Circle Reader Service No. 6

Featuring all three AUI (10Base5), Thin Ethernet (Cheapernet/10Base2), and 10BaseT, the *A2066* can interoperate with standard Ethernet media types providing flexibility in cabling an Amiga network. A link status and collision LED are provided for monitoring network activity. The unit includes a boot ROM socket as a standard configuration.



3D Instructional Video

Product: Animation 202: Fractal Freedom
Description: Second video in a series of tutorials on fractals.
Price: $35
Myriad Visual Adventures
1219 N.W. 79th St.
Oklahoma City, OK 73114
Circle Reader Service No. 7



Instructor D.L. Richardson explains how to create 3D animations using a basic Amiga computer with both fractal landscape generators and fractal art software. *Animation 202* includes a 10-minute action adventure Oklahoma Ken, a takeoff on the Indiana Jones movies. All of the animations in the movie were created on an Amiga 3000 and recorded in real time.

Macintosh Emulator

Product: Emplant
Description: Macintosh II emulator for the Amiga.
Price: $280-$400, depending upon options
Utilities Unlimited Inc.
1641 McCulloch Blvd.,
Ste. No. 25-124
Lake Havasu City, AZ 86403
(602) 680-9004
Fax (602) 453-6407
Circle Reader Service No. 8

Emplant is a combination of hardware and software that allows an Amiga to run software applications intended for the Apple Macintosh II.

To operate Emplant requires the use of Macintosh ROM (read-only memory) chips and the software that comes with the package. The product also relies on custom-programmable logic that lets it work as if it were a Macintosh. Emplant multitasks with the Amiga operating system.

Non-AGA machines support a 16-color Macintosh interface. AGA machines with the product display 256 colors; Amigas with Retina video boards will display 16 million colors.

According to the company, emulators for Macintosh Quadras and IBM 386- and 486-computers are planned.

Amiga Audio Card

Product: Wavetools
Description: A 16-bit audio card that plugs into an Amiga 2000, 3000, or 4000 computer.
Price: $350
Digital Audio Designs
P.O. Box 5058
Fullerton, CA 92635
(714) 562-5926
Circle Reader Service No. 9

Wavetools uses the computer's hard disk drive to record, edit, mix, and playback audio. It was designed with 64 times over-sampled Sigma-Delta conversion technology which allows the units to have a frequency response of 10Hz to 20kHz and a dynamic range of 85dB. Wavetools comes with a pair of stereo I/O jacks for direct connection to any device with standard line in and line out.

Master Calendar

Product: ES-195
Description: Digital interface for time and date displays.
Price: $700
ESE
142 Sierra St.
El Segundo, CA 90245
(310) 322-2136
Circle Reader Service No. 10

The *ES-195* receives ESE time code from a master clock or time code translator and converts this data into two formats. One is an ESE serial time code which drives digital time and date displays. The second output is an ASCII form which the GVG "Master 21" Switcher decodes and uses for its time and date reference. The unit can drive digital time and date displays with the same time and date information.

Printer for Commodore Amiga

Product: Primera™
Description: A color printer that provides thermal transfer and dye sublimation output.
Price: $995

Fargo Electronics
7901 Flying Cloud Dr.
Eden Prairie, MN 55344
(612) 941-9470
Fax (612) 941-7836
Circle Reader Service No.11

The *Primera* uses thermal transfer technology to produce quality output on paper, transparency film

New Updates

3D Object Processing Software

Product: Vertex 2.0
Description: Advanced 3D Object Processing Software compatible with the Amiga Imagine.
Price: $79.95
The Art Machine
4189 Nickolas
Sterling Heights, MI 48310
(313) 264-2110
Circle Reader Service No. 12

Building on the easy-to-use, original Vertex, the *Vertex 2.0* advanced interface offers quick and high-precision 3D graphics. It's equipped with many new features such as rotate free, EPS importing from ProDraw 2.0, fractal trees, and built in attributes editor. The software requires AmigaDOS 2.0, and at least 2.5 MB of free fast RAM.

Amiga 3D Objects Collection

Product: 3D Objects Collection for Imagine 3D
Description: Software for creating 3D objects.
Price: $24.95
Kinetic Designs
P.O. Box 1646
Orange Park Fl 32067
(904) 272-0371
Circle Reader Service No. 13

This 12-disk collection of shareware 3D object files for Imagine 2.0 allows Amiga users to design 3D objects without having to build them from scratch. *3D Objects Collection* includes over 120 objects such as toys, weapons, and fantasy.

Audio Hard Disk Software

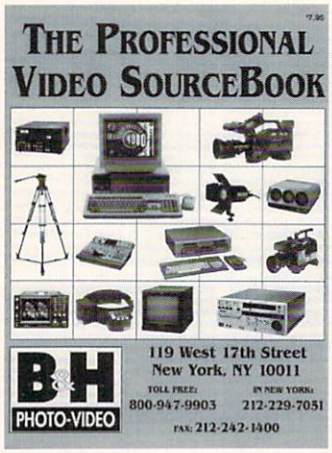
Product: Studio 16 Version 3.0
Description: Digital audio hard disk recording and editing software for the Amiga 2000, 3000, and 4000.
Price: $595.95
SunRize Industries
2959 S. Winchester Blvd.
Ste. 204
Campbell, CA 95008
(408) 374-4962
Circle Reader Service No. 14

The most significant new feature of *Studio 16 3.0* is the timeline based cue list which makes audio production as simple as point and click. The built in SMPTE time code reader on both of SunRize's audio cards allows for easy synchronization of digital audio to video tape. Other major features: automatic fades and cross fades, external MIDI mixer support, and multiple digital audio card support.

or T-shirt transfer paper. It's compatible with all Amiga computers with Version 1.3 or higher operating systems and requires a minimum of 2 MB of RAM.

Video Product Catalog

Product: The Professional Video SourceBook
Description: Two hundred fifty-two-page catalog on professional video/audio products.
Price: $7.95
B&H Photo-Video
119 W. 17th St.
New York, NY 10011
(212) 229-7051
Fax: (212) 242-1400
Circle Reader Service No. 15



The Professional Video SourceBook is a well-organized, thorough reference that should guide novices and well-seasoned pros through the complicated maze of video and desktop video equipment. It provides ample coverage of Panasonic and Sony products, including S-VHS and Hi-8 equipment, as well as coverage of devices from other manufacturers, such as BTS and JVC. The NewTek Video Toaster and a number of third-party products and software from companies such as DPS, SunRize and InnoVision are covered at length.

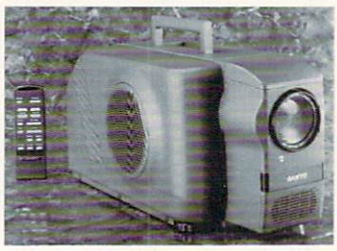
TBC

Product: Dual 4:2:2-Pan TBC/Synchronizer
Description: TBC that interfaces with a Panasonic laser disc player.
Price: not available
Feral Industries
5925 Beverly
Mission, KS 66202
(913) 831-1791
Fax (913) 831-3427
Circle Reader Service No. 16
The *4:2:2-Pan TBC/Synchronizer* was designed to adapt to a laser

disc player automatically to eliminate frame shake produced during freeze or slow-motion special effects. Available in single or dual channels, the unit includes three inputs (two composite, 1 S-VHS) and two outputs (one composite, 1 S-VHS) per channel. It also offers 8-bit, 4:2:2 component processing, 5.5MHz bandwidth and variable strobe. It operates in NTSC or PAL video standards and features genlock with SC and H phase controls and transcoding between composite and S-VHS video formats.

Video Projector

Product: PLC-300
Description: A data grade and composite LCD video projector.
Price: not available
Sanyo Industrial Video Division
1200 W. Artesia Blvd.
Compton, CA 90220
(310) 605-6527
Fax (213) 605-6529
Circle Reader Service No. 17
The *PLC-300* system features a remote control motor drive zoom



and focus with a built-in 3-watt amplifier and speaker. It can automatically sense frequencies between 15 and 37.9 kHz. Its input ports include DB25, S-Video and composite video BNC connectors. The unit's overall resolution is 550 TV lines, which equals a dot resolution of 720-by-640 dots. In addition to being compatible with all major computer systems, the PLC 300 is light weight and offers the ability to replace lamps in the field.

Music Library Catalog

Product: *Buy-Out Music*
Description: Energetic Music's 1993 catalog
Price: free (music libraries vary in price)
Energetic Music Inc.
645 S. Massachusettes
P.O. Box 84583
Seattle, WA 98124
Circle Reader Service No. 18
Buy-Out Music provides listings and descriptions of the company's

music libraries. Their collection is diverse and includes music for every day events like bicycle rides to more esoteric mental states like dreaming. They also provide a variety of LT-1 logos and transitions, such as "reverbin sax" and "morse code." Once purchased, the owner is protected under a 99 year license which covers unlimited use of the music for video, film slide presentations, multi-media, and radio and satellite broadcasts.

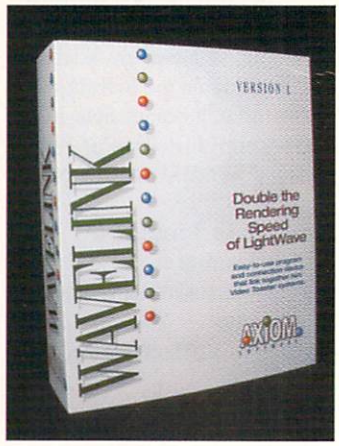
A/B-Roll Editing System

Product: Ensemble Pro 3
Description: Editing system with GPIs and serial switcher interface.
Price: varies from $7,295-$9,995
Editing Technologies Corp.
11992 Challenger Ct.
Moorpark, CA 93021
(805) 529-7074
Fax (805) 529-6744
Circle Reader Service No. 19
Ensemble Pro 3 is provided with software and hardware to interface and control most RS-422 serial VTRs and switchers. A user-supplied IBM AT class computer is recommended. The unit is equipped

with programmable VTR speed control, 10 edit lists (active in memory), and full analog and register control of GVG 100, 200 and 300. It also offers advanced edit list management. The *3S* model features an Echolab PC-3 in a professional rack mount PC.

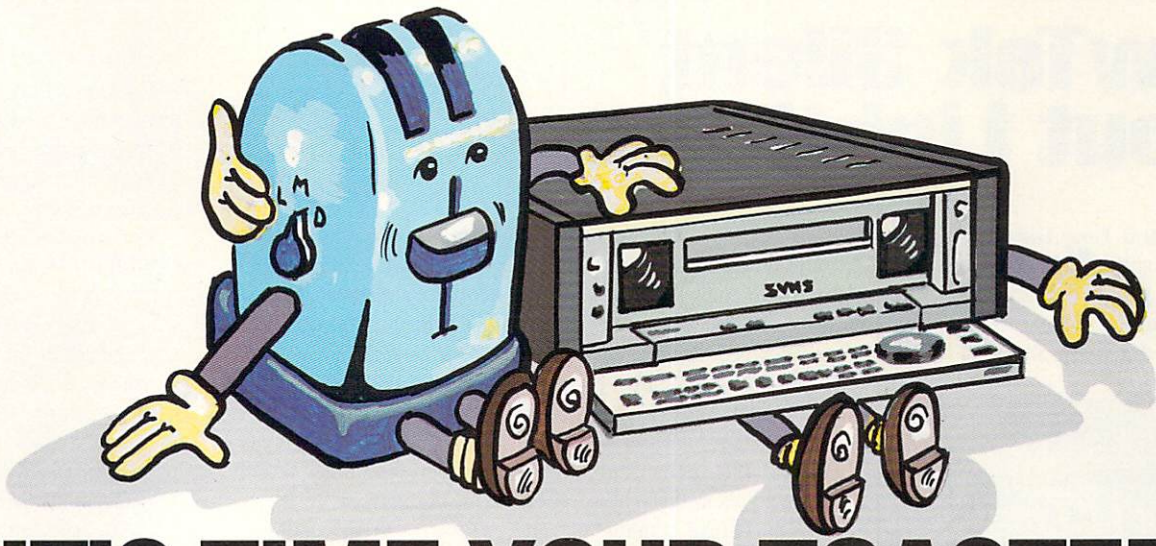
Video Toaster Linking Software

Product: WaveLink
Description: Software that links two Video Toasters together.
Price: $159.95
Axiom Software
1668 East Cliff Rd.
Burnsville, MN 55337
(612) 894-0596
Circle Reader Service No.20
WaveLink is equipped with a special version of ParNet networking



software and a cable that links two Video Toaster systems together so they can render at the same time. The software also controls LightWave on both machines. The rendered images are saved sequentially in one place. It's compatible with LightWave 2.0 and 3.0. System requirements: two Video Toasters with 2.0 or 3.0 systems and a Workbench version 2.0 or higher.

FINALLY A VIDEO RECORDER DESIGNED (AND PRICED) FOR THE TOASTER GENERATION....

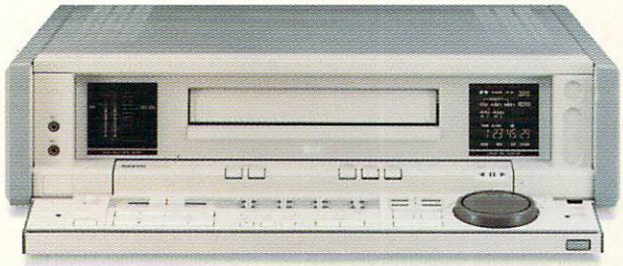


IT'S TIME YOUR TOASTER MET OUR RECORDER

What was your animation system like before Sanyo's *GVRS-950*? Building an animation system meant buying a recorder, then the *SMPTE* generator and reader, then a single frame animation controller, and probably an audio video switcher.

Think about all that time and money. It's much simpler to just purchase Sanyo's *GVRS-950*. The recorder that's a lot more than just a recorder. It's a complete audio video production system.

The *GVRS-950* is designed to meet the needs of TOASTER users. With built in *RS 232* and *RS 422* interfaces, a *SMPTE* time code generator and reader, Dual input computer controlled video and audio switchers, and a *SINGLE FRAME ANIMATION CONTROLLER ...*
ALL STANDARD.



FOR A DEMONSTRATION OF SANYO'S GVRS-950 JUST CALL SANYO FOR THE NAME OF YOUR NEAREST PRODUCT REPRESENTATIVE.

SANYO

Industrial Video Division 1200 West Artesia Boulevard Compton CA 90220
Phone: (310) 605-6527 Fax: (310) 605-6529

Circle Reader Service No. 147

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TOASTER TIMES

NewTek Silent about LightRave

Phil Kurz

When Warm & Fuzzy Logic Inc. introduced LightRave, a software program and dongle that unlocks LightWave from the Video Toaster, many expected a sharp and swift response from NewTek.

Despite the fact that LightRave ($499) allows any Amiga user to run LightWave without a Toaster, NewTek has remained surprisingly silent to the public about the product.

According to Warm & Fuzzy Logic president Michael Vunck, there has been no official communication between NewTek and his Richmond, Va.-based company. Vunck also reported that sales have been "brisk" since the product was introduced in September at the Pasadena, Calif., World of Commodore Show.

Some software developers have questioned the legality of the product, which allows both registered and pirated versions of LightWave to be run without the Video Toaster. But Warm & Fuzzy Logic has broken no laws, Vunck said. He pointed out that his company requires its customers to include their Video Toaster serial number on LightRave's product registration card to become eligible for future product upgrades. In that way, he said, his company is doing its part to discourage illegal copy and use of LightWave.

If NewTek were to sign an agreement to "hold harmless" LightRave users from legal action, Warm & Fuzzy Logic would give NewTek its list of LightRave owners to confirm that they are registered Toaster owners, Vunck said.

However, Warm & Fuzzy Logic has not communicated this proposal to NewTek, Vunck said.

For its part, NewTek has declined to comment about the introduction of LightRave. However, shortly after its introduction, NewTek quietly stopped selling Toaster 3.0 software upgrades.

VTU

Digital Animation Corp. Acquires Toasters

Frank Kelly

Digital Animation Corp. (DAC), known for using high-end PC-based systems for stock and custom animations, has purchased two Toaster 4000 systems.

DAC creative director Paul Henderson said that the PostScript font support available in LightWave 3D was instrumental in the company's purchase decision since it allows greater flexibility in matching fonts with existing logo art supplied by their custom animation clients.

The company has also added a DPS Personal Animation Recorder which, according to Henderson, "has increased productivity on the Toaster by tenfold," since it eliminates much of the trial-and-error time associated with creating test frames. And with the PAR/Toaster combination, low-resolution, full-color previews can quickly be made for client approval prior to high-resolution rendering of the final animation.

The company plans to add another Toaster and a Screamer rendering engine.

VTU

Profile

Video Toaster Takes on Toyota

Josh Moscov

It only took Jason Katsoff, computer graphics specialist for the advertising agency, Saatchi & Saatchi, one weekend last July to learn enough about the Toaster 4000 and LightWave to complete a package of 3D logos for one of their most important clients, Toyota Sales America.

Needless to say, Saatchi & Saatchi were quite impressed with Katsoff, 24, and their new Toaster, which they had purchased the week before Katsoff's crunch weekend. They were hopeful that the logos would bring the agency big business since they were to be used at the end of every Toyota TV commercial as part of a new marketing campaign.

The Toyota Sales America staff was floored by Katsoff's logos and amazed that he could create the package so affordably in-house with the Toaster. "The Toyota account people repeatedly asked, 'Wow, what did you do that (the logos) with?" Katsoff remembers.

It seemed like LightWave 3D graphics were going to make the campaign fly. But that was the end of the 3D Toyota logo.

Despite Toyota Sales America's enthusiasm for Katsoff's logos, they had to reject the package since it didn't pass Toyota Motor Corp.'s (the Japanese parent company) "logo guidelines" for 3D representation of the Toyota logo. Yet it was still a victory for Katsoff and his Toaster 4000. "Even though they couldn't use the logos, it was quite apparent to everyone involved that the Toaster could be a tremendous help to our creative efforts. Prior to the purchase, we had been looking for a platform that was strong in the areas of character generation and 3D animation. I was also particularly interested in working with ToasterPaint.

Since then, the Toaster has become an integral tool in the agency's

International Watch

Christina Knighton

MONTREAL

Toaster Graphics Aid Canadian Network

In fall 1993, Canadian citizens got a taste of Toaster graphics when Tele-Metropole Inc., the French-Canadian television network, used the Toaster while reporting on the country's federal elections.

"Up until recently, I had mostly used Topaz. But in my opinion, LightWave 3D gives me a more professional look in less time and effort," said Michel Barreire, CFTM graphics producer.

In all, CFTM uses six Video Toaster systems; they are located throughout the facility, from an off-line edit suite in the news department to the computer graphics department.

International Continued on Page 18

growing computer graphics workstation. To work with the Toaster, they have added an Impulse Firecracker, a frame-buffer board that brings out Toaster RGB. With ASDG's Art Department Professional, Katsoff can send an image to the Firecracker, which is the same as what the Toaster is displaying, but in RGB. His TVL presentation graphics system can input the image without using a single disk. "Thus, any graphic I do on the Toaster can immediately be put into presentation graphics, making it completely accessible to me during a presentation or whenever," he explained. He also noted that a year ago, the company updated their entire facility including their online edit bay, so the purchase of the Toaster became even more worthwhile. It is now fully integrated with the editing system.

All of this modernization of the agency's technology was well timed for Katsoff, who spent last fall creating graphics for Toyota's year-end retail campaign. For the December commercials, he worked on the graphics for the set which included a video wall of two rows of monitors with different slogans crashing across them.

And with approval from the Far East "logo officials," the 3D graphics are floating too.

VTU

The Hollywood Insider

By Wil Wheaton

Imagine your life without a personal computer. You have to go to an accountant to make every change to your books. You still roll paper into your typewriter and hold your breath when typing your letters hoping not to make a mistake. Can you even imagine how you'd entertain yourself without Falcon or Tetris?

When the first personal computers came to market in 1976, no one ever believed you could insert a new paragraph in a document without retyping it, much less run a business from your desktop. Today, thousands of people worldwide publish magazines and manage businesses with their personal computers.

Now imagine your life without a video camera. If you want to shoot your family gathering, a vacation or some other special occasion, you'd have to load your 8mm film, shoot it, send it out for processing, retrieve the processed footage, thread your projector, set up your screen and go to town. Want sound—forget it, unless you had oodles of money and even more patience.

When the first video cameras came to market, they were an expensive novelty. However, it didn't take long for the prices of video cameras to drop, which resulted in thousands of people seeing this handy device in a different light. Rather than simply a way of capturing a special family event, the video camera became a useful tool in the workplace. Some went so far as to think that they might be able to make their own TV. And that's exactly what a few dared to think and do—especially those with a certain computer peripheral that transformed their Amiga into a TV studio.

Off the Road

I recently completed a trip around the country visiting Toaster dealers and users like you. I am happy to say that many of you have seized the opportunity presented by personal video production and are making video—not simply for fun—but for profit. Some of you have been so successful that you've been able to quit your daytime job and make video a full-time gig.

I realize that quitting your job and buying your personal video production studio equipment is terrifying. I quit my highly lucrative job as an actor in Hollywood, land of babes, and moved to Topeka, land of cows, and the home of NewTek. My friends and family thought I was crazy to change my life so dramatically. Why did I take such a drastic leap of faith? Simply stated: I know that personal video production is the future, and I know that you and I will be making the next round of television shows and movies thanks to it.

Many of you know firsthand what I'm talking about. You live the personal video revolution and are waiting for the explosive growth in the number of television channels that will result from direct broadcasting and fiber optic television delivery. All I can say is, you'll get your chance. Oh yeah. If your friends look as strangely at you when you explain your dream of making a movie as mine looked at me when I moved to Topeka, ask them to imagine their lives without their personal computers. If they run a business with the help of their computer, there's hope for them. They might recognize that just as the personal computer gave them the freedom to manage their business themselves, the Video Toaster will give you the tools you need to chase your dream.

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International Continued From Page 17

The station also uses the Toaster on Jepardy, (French version of the U.S. game show) and Star D'un Soir, a variety show.

TOKYO

First Japanese Amiga Owner Alive and Well

The first reputed Japanese Amiga owner has risen to notoriety as an independent animator.

Purchasing the historic Amiga in 1985, Takao Momozono now presides over a well-endowed video production facility. He has a total of five Video Toaster systems (one Toaster is in an A4000, the rest are in A2000s) outfitted with DPS's Personal Animation Recorder, TBC III and IV, and the Personal Component Adapter.

Takao Momozono created this artwork for *If Moshimo*.

His work is seen regularly on prime time television including the opening to *If Moshimo*, a show described as "where *Twilight Zone* meets *A Christmas Carol*" and Ancient Egypt Puzzle, a children's quiz show. He has also done commercial work for *Mac Donalds* and Ichitaro Version 5, Japan's best selling world processing program.

FUKUOKA, JAPAN

Japanese Musicians Rock with Toaster

Similar to musicians turned Toaster pioneers Todd Rundgren and Laurie Anderson, Japanese pop band Date of Birth (DOB) has caught on to the video production opportunities now available in the desktop video industry.

DOB member Kenichi Shigeto's private studio (near the province of Kyushu) houses three Video Toaster workstations: two Amiga 4000s and a 2000. The two A4000s are linked via ParNet and the remaining A2000 is networked to a Macintosh Quadra 950 via ToasterLink. Shigeto uses the Sony Hi8 edit deck (EVO-9800A) as well as Panasonic's industrial S-VHS decks (AG-7750 and a AG-7650).

Courtesy of Kitty Records

"Many bands produce their own videos, but it is very rare that you find a band that can create video, like we do" Shigeto comments.

He also uses his Video Toasters to switch live concerts, design CD covers, and to produce QuickTime movies.

VTU

[Editor's Note: We are interested in receiving information related to the Video Toaster for International Watch. Please send press releases and other materials to: International Editor, C/O Video Toaster User, 273 N. Mathilda Ave., Sunnyvale, CA, 94086.

News Network Available to Desktop Video Industry

Josh Moscov

Bloomington, Minn.-based desktop video dealer Alpha Video has entered the niche-oriented information age with the Desktop Video Wizards Network, a private, interactive network dedicated to the informational needs of desktop video dealers and manufacturers.

According to Channel 4000 producer Susan White, the network was the idea of Alpha Video owner, and former NewTek sales manager, George Johnson. "He was inspired to set up the Network after talking to Toaster dealers at this year's NAB. He found that there was genuinely a need to get information to dealers on a daily basis since there's so many changes occurring in desktop video." Soon after, Alpha Video negotiated with Scala to have Channel 4000 disseminated by InfoChannel.

Toaster dealers have been active supporters of the network; initial members (who are Toaster dealers) represent 80 percent of Video Toaster dealer sales in the United States. In response, Channel 4000 has been running unlimited information on the Toaster. White cited the running of NewTek's announcement of the Screamer on Channel 4000's NewsLine as a highlight from last year. "Obviously, one of our initial goals was to provide as much information as possible on the Toaster and related products. And so far, our TechLine has been quite popular since dealers need tips on working out Video Toaster 4000 bugs," she explained." In addition to the NewsLine and Techline, the network has four other programs reporting on various aspects of the industry.

While the Toaster dealership community has been the main priority of Channel 4000, White went on to say that a future goal of the network is to represent as much of the desktop video industry as possible. The network is currently negotiating with several other manufacturers who specialize in PC and Macintosh platforms and products.

Now available five days a week, Channel 4000 can be accessed by an Amiga 1200 (and higher) and requires 6MB of RAM; Alpha Video recommends having up to 120 available MB since Channel 4000 contains AGA graphics and high-quality audio.

Dealers, manufacturers and users of desktop video products who are interested in receiving the network can call Alpha Video, (800-DTV-0008) for subscription information.

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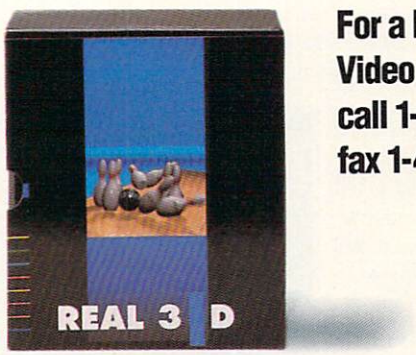

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RGB Files Suit against Pride Integrated Video

AmiLink Maker Alleges Copyright Infringement

Angela LoSasso

In fall 1993, Riviera Beach, Fla.-based RGB Computer & Video Inc. filed suit in U.S. District Court, Southern District of Florida, against West Palm Beach, Fla.-based Pride Integrated Services Inc., makers of the Pride Integrated Video PIV-2001 video editor. Pride Integrated Services' joint partner, Rodion Molina is being sued by RGB as well.

RGB alleges that Molina, an RGB employee from 1987 to 1989, "misappropriated Amilink's source code for its computer-based video editing system when he left the company, which was contrary to the terms of his employment. According to a press release from RGB president Steven Crane, RGB "is alleging copyright infringement and misappropriation of trade secrets, and is seeking preliminary and permanent injunctive relief, actual damages, punitive damages and other relief."

On Oct. 8, 1993, federal marshals seized the source code and a programming computer from Pride offices and Molina's home. In the same action, a temporary restraining order was granted; however, it was lifted hours later.

In response to VTU queries, Pride stated in a press release: "After reviewing the RGB material and the taking of depositions, our attorneys offered to allow an independent expert, agreeable to both parties, to review the computer code of each party to determine the existence of any copyright infringement. Our offer was rejected by RGB."

The Pride release also said that its PIV-2001 Amiga-based video editor is "substantially different in design and operation as compared to RGB's AmiLink system." One such difference is the PIV-2001 "is software driven rather than hardware dependent."

Commenting on the RGB allegations, Pride spokeswoman Ghene Maupin said, "The reports are untrue. Pride has an excellent reputation in the community. You cannot be in business for 24 years and not be beyond reproach."

When reached by telephone, RGB president Steven Crane responded, "We feel very strongly about our position."

What about the Customer?

Buyers of Pride's PIV-2001 face a dilemma. If RGB proves its case or obtains another restraining order prohibiting Pride from selling the PIV-2001, future technical and product support are in question.

Sales of the PIV-2001 have not been affected by the RGB suit. Pride's Maupin reported that business is bustling and noted, "We are backlogged with sales."

At press time, the RGB suit against Pride and Molina was in discovery with more depositions scheduled.

VTU

Profile

The Road to 3D Entrepreneurship

Josh Moscov

Four years ago, Daniel Ablan graduated from Valparaiso University with a Bachelor of Arts in Broadcast Journalism and entered one of the worst journalism job markets in the history of the United States.

Yet with a genuine drive to succeed and an open mind to emerging vocational opportunities in video production, Ablan has fended off the recession blues.

As program manager for Valparaiso, Ind.-based cable Channel 8, Ablan was always trying to improve the quality of the channel's news program. Intrigued by some product information on the Toaster, he went to a demonstration at a local college and was immediately impressed by its character-generating abilities. Without allocated funds in the station's budget for new computer equipment, Ablan purchased the Toaster 2000 instead of upgrading the station's Quanta Character Generator. "After doing my research, I found that a new Toaster was cheaper than a comparable Quanta. And the Toaster offered us more. We were able to do our 30 minute news program through it with still stores as well as creating great wipes. Right away, all of our productions looked better."

Two years later, Ablan was offered a job as a video producer by United Consumer Club, producers of corporate training videos, who had been referred to him by the video company he had purchased Channel 8's Toaster from. "Initially, they contacted me because they had been having trouble for weeks with bugs in their Toaster system. At the same time, their producer quit and they just hired me on."

Ablan's production work for United Consumer Club has demanded that he be well-versed with all of the Toaster programs. At the same time, programs like LightWave 3D have enabled him to use his visual arts skills in new ways. "My schooling and training were in broadcast journalism and photo journalism and I have never lost my passion for photography or editing tape. My 3D work is an extension of that."

As a result, in January of 1993, (and in addition to his full-time position at United Consumer Club) Ablan founded AGA, a LightWave-based graphics and animation company. He is currently working on animations for various companies.

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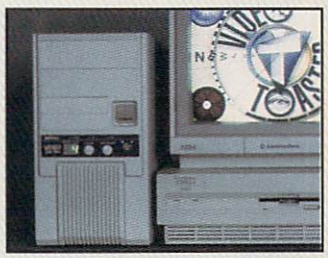

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DEAR JOHN

Scanning Slides

The Ins and Outs of Image Manipulation

By John Gross

This month's column answers Toaster-related questions from CompuServe and the *VTU* mailbag.

If your questions for Dear John are answered in print, *Video Toaster User* will extend your subscription for one year and send you a *Video Toaster User* T-shirt. Send your questions to the street or online address listed at the end of this column or to *VTU*.

Q: I am a videographer in Garmisch, Germany. My equipment includes an Amiga 2000 with a GVP G-Force 030, 40 MHz accelerator, AmiLink CI editor, NewTek Video Toaster and a few other pieces of equipment.

I would like to expand into working with still photography. Principally, I'm interested in slide manipulation. I want to be able to take a 35mm slide, import it into the digital computer environment, alter it to the client's specifications, and then output the altered version back to a slide again.

Is there an Amiga platform equipment available that will allow me to do this? Are there any scanners on the market geared toward importing slides into the computer environment which will maintain the resolution quality of the slide? Once inside the computer, what would be the best software to use for the manipulation process? Could ToasterPaint do this and maintain the picture quality? What's needed to once again output the image to a slide?

The Poloroid CI-5000S slide printer will work with the Amiga if proper drivers are installed to control it.

I have found one machine that will create slides from a computer's output. It's called the Polaroid CI-5000S. The brochure states that it is compatible with DOS, Windows and the Mac, but there is no mention of the Amiga. Do you know of any machines like the CI-5000S that are compatible with the Amiga platform?

I have another quick question for you. I am primarily a video person new to the computer environment. I am curious to know what, for example, 500 DPI on a computer would equate to in video. Is 500 DPI equal to 500 lines of resolution? And here's one more to consider. How many lines of resolution can the human eye perceive? I am sure at some point lines of resolution and DPI become a moot point if the eye can not tell the difference.

I apologize for my long letter, but I hope you can provide some insight to the questions I have posed.

Kevin Dixon
Nivek DTV Productions
Garmisch, Germany

A: There are many methods for bringing slides into the computer environment. Not only could you use a camera to just grab the slide, you could use one of two scanners that work with the Amiga. The Epson ES600C (600 DPI) or ES800C (800 DPI) in conjunction with their slide/transparency adapter or the Sharp JX320 with its slide/transparency adapter work well. You would need to use either Great Valley Products' (GVP) ImageF/X, which has built-in scanner control, or ASDG's Art Department Pro and the appropriate scanner module (includes cable) to control the scanners. If you intend on doing a lot of retouching to the slides once they are in the computer, I would say that either ToasterPaint or ImageF/X (or both) would work quite well for image manipulation.

The Polaroid CI-5000S (or CI-3000S) will work with the Amiga. You will need ASDG's Driver to control the slide printer. Another option that many people use for slide output is to save the images out as JPEG or TIFF files and take them to a Mac house that can output them to slides.

As far as DPI and lines of resolution are concerned, I know of no chart or reference for comparison. Comparing DPI to lines of resolution is like comparing apples to oranges. They are two separate things and do not invite comparisons. How many lines of resolution can the human eye perceive? I think it depends on how close you are to your monitor!

Q: I'm using ToasterLink to transfer images from my Toaster to a Mac, but ever since I upgraded my Amiga system to Workbench 2.1, my ToasterLink hasn't worked. It always says "Standby" as it normally does, but then it just sits there, with the clock spinning. I have my Toaster system set up to automatically boot the Toaster and I run ToasterLink through a startup script, as I am using my Toaster interface monitor (NEC 3D) on my Mac. I control the Toaster from the Mac side because all I am doing is grabbing video images. Any ideas?

Doug Prossen
Albany, N.Y.

A: You may want to get a switch box for your monitor so you can share it between your Mac and your Toaster (I have the exact same setup). Then you can see what is happening on the Amiga side. I played with my ToasterLink setup to see if I could duplicate this problem.

Here's why it's happening: Chances are you're using the built-in Cross DOS function of Workbench 2.1 to read PC-DOS disks on your Amiga. If you have it set up so the Amiga will automatically read the PC disks (i.e., you get two icons when you insert a floppy, one for the Amiga and one for PC0:), ToasterLink will pause as it is loading while trying to read the PC disk. If you look at the Amiga screen while this is happening, you will see a request that says, "No disk in Device PC0:." If you have an Amiga-formatted disk in the drive, the requester will say, "Not a DOS disk in Device PC0:." Either way, all you have to do is click on the Cancel button and the requester will disappear and ToasterLink will finish loading.

Dear John Continued on Page 24

Picasso II

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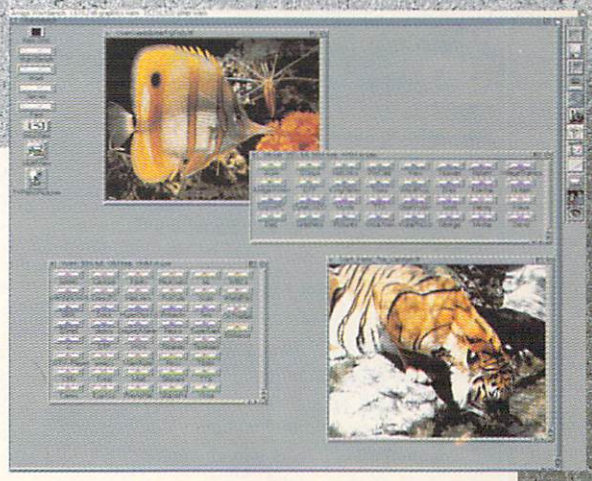

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Picasso II RTG means *Hi-Performance.*

The Picasso II has an on-board Blitter which supports drawing speeds up to 30 megabytes per second. The Picasso II Blitter has been fully integrated into the RTG emulator. Any program running under the RTG emulator will automatically take advantage of the Blitter. Off screen displays are moved into Picasso II display memory using the Blitter for super fast screen updates.

Picasso II RTG means *No More 'Chip Ram Blues'*

The Picasso II RTG emulator has been designed so that it uses no chip ram for its emulation. Only the currently visible display is kept in the Picasso II display memory, all other screens are stored in standard system memory. This means that all system memory can be used as graphics memory. A system equipped with 16 megabytes of ram would be like having a 16 megabyte graphics board!

Picasso II RTG means *Maximum Compatibility.*

The Picasso II RTG emulator supports Workbench 2.04, 2.1, 3.0, and beyond. The Picasso II is compatible with any Zorro II or Zorro III equipped Amiga system, such as the A2000, A3000, or A4000.

Picasso II AutoSwitch means *One Monitor.*

The Picasso II comes with a built in electronic switch that automatically routes the proper signal to your monitor. When the AutoSwitch detects non-Picasso II screens, such as those used by games and older software, it automatically routes the signal directly to your monitor. When the AutoSwitch senses a Picasso II screen mode, it will automatically switch back.

The Picasso II comes packaged with TVPaint Jr. (24 Bit Paint Program), and drivers for ArtDept Professional, ImageFx, ImageMaster, and Real 3D 2.0.

***Re•tar•get•ab•le Gra•phics** *adj.*: The ability to run software on any third party graphics board. *See also*: Picasso II.

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If you do not need the automatic PC reading on your Amiga, simply remove the PCO icon from the DOSDrivers drawer, located in the DEVS drawer on the Workbench (make sure to store it in the DOSDrivers drawer in the Storage Drawer). The next time you start up the Amiga, ToasterLink should work properly.

Q: I use an IBM PC for some business needs and I own a lot of Postscript fonts, plus Adobe's Type On Call CD-ROM with potentially over 1,000 more. Is there any way to use these Type 1 fonts with my Toaster 4000?

David Stenson
High Hat Video Productions
Amarillo, Texas

A: The Adobe Type 1 fonts used in the Toaster are IBM style. You should have no problem using your fonts with the Toaster. You will need both the font file and the .AFM file in order to use the fonts in both CG and Modeler.

Also, getting the fonts over to your 4000 should be no problem either. It has a built-in PC disk reader that reads and writes any type of 3.5-inch DOS disk.

Q: I want to know if an Amiga can render LightWave frames without a Video Toaster card. In other words, can I create a render farm with a single Amiga with a VT card and a network of Amigas without VT cards for rendering?

Gordon Durnell
via CompuServe

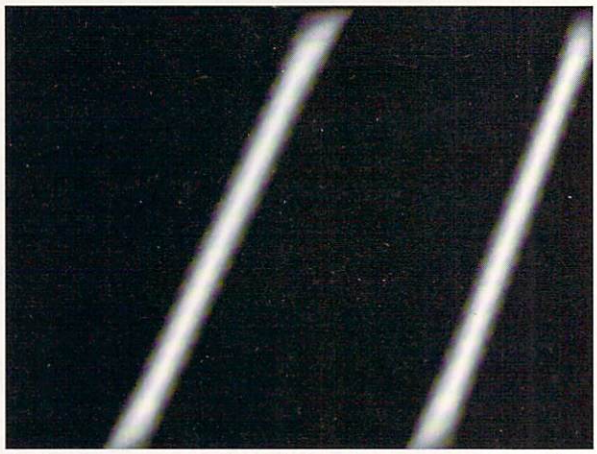
A: No, LightWave needs to have a Toaster card present in order to render frames. It is possible to set up a render farm with multiple Amigas with no hard drives as long as they boot off a floppy and access a server which contains the Toaster software. Each machine would need to have its own Toaster hardware and a network card. This question could be moot however, as with the addition of NewTek's Screamer to your single Toaster, you would have the strength of a very large render farm on your desktop.

[Editor's Note: It is possible to render frames without a VT card in other Amigas with the following exception: If you are a registered Video Toaster owner with Version 2.0 or 3.0 and also purchased Warm and Fuzzy Logic's LightRave (a hardware module and software combination), you can run LightWave on any Amiga without installing a Video Toaster card. For a render farm to be possible, networking cards, cables and software would be needed. For more information about LightRave and industry reaction, please refer to "NewTek Silent about LightRave" in Toaster Times, page 17.]

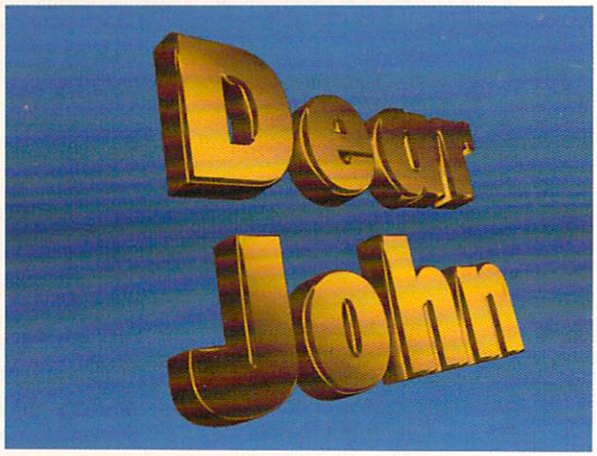
Q: Although I've been a Toaster owner for a couple of years now, I have only recently started using LightWave (with a Toaster 4000). I have a few questions.

1. When trying to create a backlit effect from behind an object such as text that is positioned just in front of another object, should I place lights in between the two or should I create another version of the text object that is slightly smaller (and completely flat) and make it 100 percent luminous?
2. How do I create the Sale effect as seen in the Toaster 4000 demo tape? The Sale text object appears to have an extended, semitransparent copy trailing into the seen ala Superman movie titles. Do you think NewTek created two separate objects, or is it some sort of surface envelope?
3. When creating a flash of light across a logo that is static in the frame, should I use a moving planar surface texture across the surface (and if so what kind of frequency and falloff should I use); or, would placing spots with very narrow apertures on the barn doors, and moving them across the scene aimed at an angle to the object be better? Any and all suggestions are appreciated.

Frank Vanella
via CompuServe



The best way to create a "flash of light" across a logo is to use a reflection map. Make an all-black image with a few diagonal, white streaks.



I used the top reflection map for the surface of the above logo with color highlights (and a high degree of reflection).

A: Here goes·

1. The easiest way to get a glow behind objects is to place a point light behind the object, use a lens flare and select the Glow Behind Objects button in the Lens flare panel. This was a feature added for seaQuest and believe me, we use it a lot! It's important to know that Glow Behind will not work properly if you have the flare located behind a transparent object but in front of an opaque object. Your best bet is to make sure there are no objects behind the light flare that has Glow Behind Objects selected.
2. For the Sales effect, simply give the sides of the text a different surface name and make them semitransparent, with trans edges and slightly luminous. Then stretch the object out.
3. The best way to create a "flash of light" across a logo is to use a reflection map. Make an image that is all black with a few diagonal, white streaks running through it (blend the edges into the black). See image below. ToasterPaint will work well for this. Use this image as a reflection map for the surface of the logo and make sure to use color highlights (usually you would want a high degree of reflection). See the result directly above. The easiest way to make it shoot across the logo is to parent the camera to the object and spin the object around. This causes the surface to reflect different parts of the image map and it will appear as if light is rushing across the surface.

VTU

John Gross is a Video Toaster graphic artist primarily using LightWave 3D. He conducts seminars on Toaster use and is currently working as an animator on the NBC/Steven Spielberg television series, seaQuest DSV.

Questions can be sent to him at:
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TIPS & TECHNIQUES

Real-Life How-Tos

Video Toaster Users Share Their Real-Life, How-To Secrets, Shortcuts, and Lessons

By Brent Malnack

This month's winning tip was submitted by Bill Kling, owner of Bill Kling's Video Graphics in Laurel Springs, N.J. It seems as though Bill has found a solution to the problem encountered when cutting a rendered logo or text out of a black background in ToasterPaint.

For a project, you may have the need to create a 3D logo or use Modeler's Text tool for a beveled 3D font. The problem is that when you try to cut out the logo in ToasterPaint, it has stray black pixels around it.

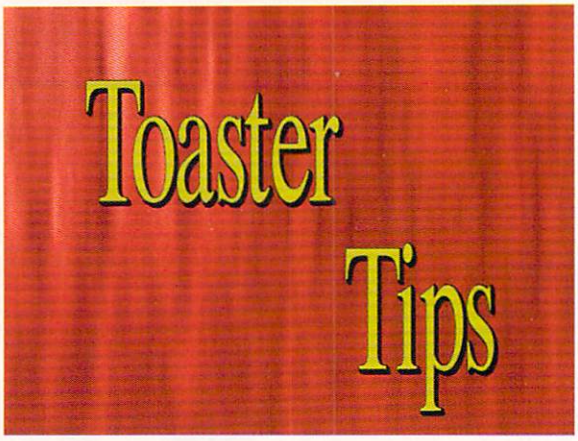

Figure 1: This image was created with the Curtain Backdrop tip. Text was added using InnoVision Technology's Montage CG.

Follow these steps to reduce the problem:

Step 1: Create a 3D logo or text in Modeler.

Step 2: Set surfaces and camera angle and render the logo over a black background. (This is the default in Toaster 3.0/4000.)

Step 3: Load the saved image or grab it from the framebuffer with the Grab>DV1 or DV2 option in ToasterPaint.

Step 4: Create a swap screen by pressing the J key. Clear the screen to a color other than black. This is done by selecting a color from the palette strip and selecting Clear from the Picture menu. Return to the logo screen by pressing J again.

Step 5: Select No Background from ToasterPaint's brush menu. This will instruct ToasterPaint to not pick up the background black color.

Step 6: Cut out the brush with the appropriate tool. Press J and stamp the brush with the left mouse button. Notice the stray black pixels.

Step 7: Press J again to return to the original image. Stamp the brush again in a blank part of the screen. If there is not sufficient space, select black from the palette strip and clear the screen.

Step 8: Cut out the newly stamped brush.

Step 9: Press J and stamp the new brush in a blank part of the screen. Notice the decrease in stray pixels.

Step 10: Follow steps 6, 7, 8 and 9 until the logo is clean enough for use in your project. See Figure 1.

Curtain Backdrops

If you have become bored with gradient backgrounds in Toaster CG, this useful tip will have you creating curtain backdrops with ease.

First, enter Modeler and create a 2m x 2m square polygon. This is quickly accomplished using the Box tool and Numeric input with coordinates of X= -1, Y= -1, Z= 0, to X= 1, Y= 1, Z= 0. Click on OK followed by clicking on the Make button.

Second, save the object and load it into LightWave. In the Layout screen, tilt the screen back about 10 degrees (Pitch = 10) and move the camera forward along the Z axis until the polygon covers the whole screen. Create keyframes for both the camera and object.

Under the Surfaces Control Panel, set the Specularity level to 50 percent. Set Glossiness to Low. Now set the bump map to get the flat polygon to look like a curtain. Click on the T button to the right of Bump Map. This will open the Bump Map requester. Set the Texture Type to Fractal Bumps.

Set the Texture Size to X= .05, Y= .5, Z= .05. This will stretch the bumps along the Y axis. Click OK.

Finally, render the object by pressing F9. To get different looks, change the Surface Color, or the Frequencies button in the Bump Map requester. The higher the number, the more wrinkles in the curtain. Higher values also will increase rendering times.

This great tip was submitted by Maury McCoy, designer of most of the original Toaster PhoneBook objects.

Alternative Input Devices

Myke Muller of RADICALifornia Video Productions sent a postcard suggesting the use of alternate input devices to control the Toaster.

Point well taken.

Most newcomers to the Amiga are probably unaware of alternatives to the mouse. One of the best choices when using the Toaster is a trackball. Instead of having to roll a mouse around, the trackball can be rolled with either a thumb or fingertips. This allows for greater control in manual Toaster T-Bar transitions. The equivalent of pressing either mouse button is accomplished by pressing buttons to the side of the trackball.

Remember that trackballs and mice are available in cordless form. For more information on these products, give these companies a call: GoldenIMAGE Technology Corp., 800-327-4482 and Alfa Data 217-356-1962.

VTU

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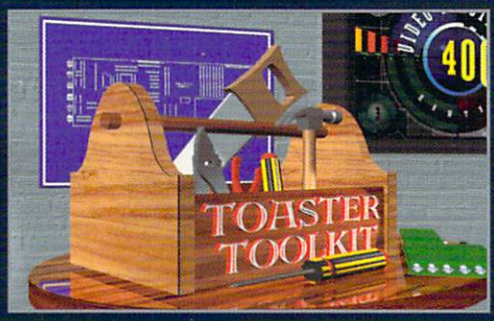

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DR. VIDEO

The Genlock Mystery

Getting in Sync with Timing Controls

By Rick Lehtinen

Welcome back to Dr. Video's Q and A session. Each month the doctor answers general questions on all topics related to video production. Whether it's lighting, equipment, electronics or what-have-you, Dr. Video's mission is to find solutions to any problems confounding you or mysteries befuddling you. Don't worry if your question seems too simple or too advanced—Dr. Video takes on all comers.

Q: How can I hook up my Toaster so I can switch live video sources, like in a disco? Right now, I have a camera hooked to inputs one, two and three, and the only one that looks good is camera one. All the others jump, roll, breakup and change colors. When I change the cameras around, the same thing happens. How can this be? Do I need a TBC?

R.E.
Mercer Island, Wash.

Rx: The doctor is willing to bet that you have neglected, or did not know, that you were required to provide a genlock signal to each camera. Set up as you have it, each camera operates on its own, having no way to synchronize its efforts with its neighbors. Once the cameras are genlocked, they are all lockstepped together. They can now all march to the same drummer. See Figure 1.

This isn't the end of the story, however. You now must compensate for the different internal delays of each camera, and the differences in the lengths of the cables leading to and from the camera. This process is called system timing. The goal is to have all of the signals arrive at the switcher at the same time. You do this by adjusting the timing controls that are usually present on genlockable cameras.

In extreme cases, it may be necessary to augment the camera adjustments. This can be accomplished either by adjusting the amount of cable in the system, or by using a variable delay box. (All of this was covered in some detail in "ABC's of video, part IV," in the Oct./Nov. issue of *VTU*.

In an analogy I have sometimes used to explain the process, genlock gets everybody marching at the same tempo; system timing gets them all in step.

Q: What is the purpose of a distribution amplifier?
A.R.
New York City

Rx: A distribution amplifier (DA) is a device which makes real-time multiple copies of whatever signal appears on its input. DAs also have the important property of isolation; that is, they can isolate one copy of the output signal from another. This is important, because if there is a problem with one of the devices fed, the DA will protect the signal going to the other devices.

Most of the time, when a video person says DA, a video DA is implied. Of course, audio DAs (ADAs) are also available.

A number of Toaster add-on products have built-in DAs. These either provide multiple copies of the program output, or provide multiple copies of a color signal suitable for use as a genlock for cameras.

Q: What is meant by the term A/B-roll?
M.R.
Rock Springs, Wyo.

Rx: Glad you asked that. An A/B-roll system consists of two playback decks (A and B) feeding into one record deck. The Toaster sits in the middle and determines which part of which video source will be fed to the destination.

A key to A/B-roll systems is that the video must be synchronous, which means it is genlocked and time base corrected. This is why TBCs or TBC cards are such an important part of the Video Toaster system. Their purpose is to render the somewhat sloppy output of a VTR into something that is genlocked and stabilized.

Q: I want to use both of my cameras in a video production, but only one of them has a provision for genlock input. What now?
M.K.
Orlando, Fla.

Rx: Most television remote trucks use the source that is the most difficult to time as the one to which the others are matched. This means that your camera, which has no genlock capability, should be connected to Toaster input one; it becomes the reference for the rest of the system. Of course, the video out of that camera must be of high technical quality. Most better cameras always include H and SC adjustments. If the camera has no such timing controls, watch out.

Q: Why should anyone want to use a S-VHS input device such as the Y/C Plus? Don't most S-VHS and Hi-8 camcorders and VCRs provide built-in composite outputs?
R.W.
Malibu, Calif.

Rx: True enough. Most any device that puts out an S-Video (or Y/C) signal, also outputs composite, which is what the Toaster accepts. However, the quality of the encoder that puts Y and C together in such a device can literally make or break the signal. In some low-cost systems, the luminance and chrominance are joined by simply throwing out some of the luminance with a notch filter. This can cut resolution from over 400 lines to somewhere around 250.

The encoder in Y/C Plus uses a chip set developed by Faroudja Labs. This allows Toaster users to keep some of the resolution advan-

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INTERWORKS

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Circle Reader Service No. 130

tages of the Y/C formats. It is interesting that some top-drawer S-VHS decks use Faroudja technology as well.

Q: I have camcorders that I want to use to record events such as weddings. Is there anything wrong with using the camcorders' built-in VTRs and also using a recorder on the output of my Toaster?

S.W.
Houston

Rx: A very common practice amongst event videographers is to use the individual cameras to provide iso-reels. These are independent tapes made by each camera in isolation from each other (hence the name). All of the video goes back to the Toaster, where it is used to create a switched, or produced feed. Later, in the edit suite the iso-reels are used as a source of cutaway material to fix transitions that didn't work or to produce segments that show the action from a second point of view.

One cost-saving measure is to use the record deck in the editing suite as the record deck for the produced feed. Of course, you have to be very careful when you carry it around. If anything happens, your business stops.

VTU

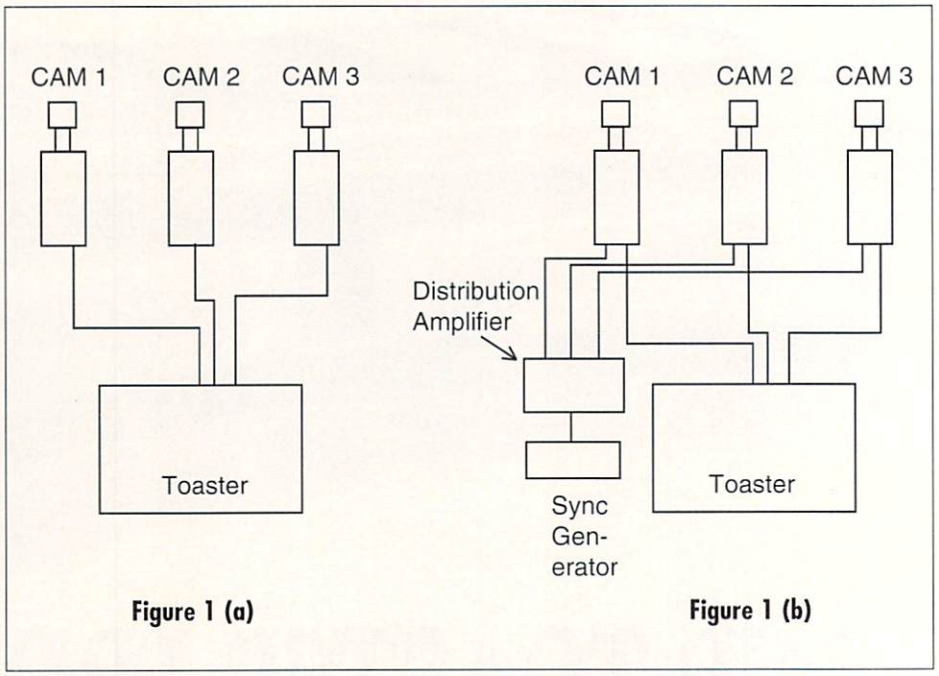

Figure 1– If cameras are allowed to run freely as in Figure 1 (a), there is no way to insure that they are all operating at the same scan frequency. This may make switching impossible. Installing and external reference, as shown in Figure 1 (b), allows all the cameras to be synchronized. This allows the Toaster to switch freely between them, provided they are timed correctly.

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Catch up on Your Bread-Making Skills

Send for Back Issues of Video Toaster User

October/November 1993
Includes a report on SIGGRAPH 1993 with a focus on NewTek's Screamer; a review of the Sanyo GVR-S950 S-VHS recorder; and "The Men Behind The Machine II," an interview with Tim Jenison and Paul Montgomery.

August/September 1993
Contains a review of the Toaster 4000; a look at LightWave 3.0's skeletal deformation feature; and the first of two interviews with NewTek founders Tim Jenison and Paul Montgomery.

June/July 1993
Reports on NAB 1993, the unveiling of the Toaster 4000; also included: the first annual *VTU Buyer's Guide*.

April/May 1993
Presents a tutorial on how to survive as a freelance videographer; a review of Sony's CCD-VX3 3-chip camera; plus, a walk through One-Stop Music Shop.

February/March 1993
In *VTU*'s Audio for Video issue, a variety of topics are examined such as: synchronizing audio with SunRize Industries' AD516; the use of MIDI with the Amiga; and working with the Toaster's frame delay.

December/January 1992
Ralph Nader's Toaster diary goes to press; *VTU* goes south of the border to interview Brazilian video producer, Valeria Burgos; also, Lee Stranahan provides ToasterPaint tips.

Other *VTU* issues currently available:
October/November 1992; August/September 1992; June/July 1992; April/May 1992

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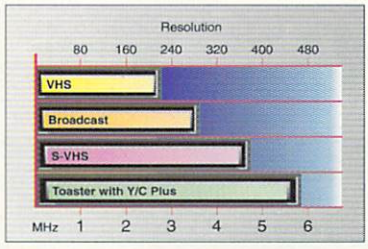
Examples shown above are actual, un-retouched framestores from the Toaster 2000 at 2-times actual size.



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Unless you design equipment for broadcast television, you probably don't know what a Two-Dimensional Adaptive Comb Filter is. Don't worry. A man named Yves Faroudja is responsible, and all you need know is Y/C PLUS includes it. Why? Because in order to decode the information contained in lower resolution composite video and convert it to Y/C data, the filter employed must first sample existing video—on either a "line" or "pixel" basis.

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Keith Nealy—Professionals Guide To Multimedia Solutions

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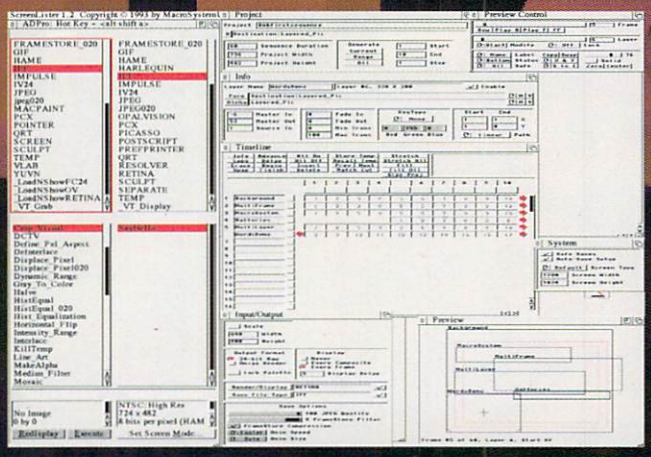
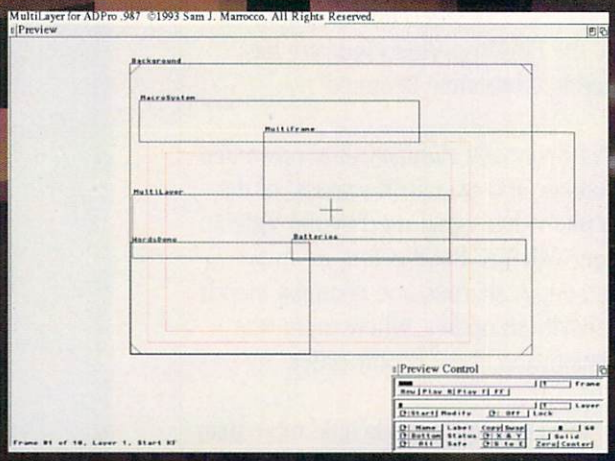
The Next Wave of Video Tools for your Toaster System

MultiLayer-ADPro – *Digital Layering*





MultiLayer for ADPro is a compositing/layering tool for video professionals & artists using ASDG's ADPro program as a compositing engine. MultiLayer improves upon ADPro's already impressive array of compositing functions by providing an extremely powerful interface for layering, compositing and editing anything from simple images to complex sequences of moving images. MultiLayer gives you the ability to perform digital compositing with an unlimited number of layers.

Features include:

A Timeline interface that provides user-friendly control of all aspects of compositing and editing. A Preview interface that provides a real-time representation of all layers/images with positioning information and size. The preview can be animated and modified with a VCR-style interface. Image representations can be dragged and positioned quickly and easily. Several types of Compositing/Digital Keying are supported including Zero-Black keys, Luminance keys, Chroma keys and Alpha keys. All compositing is performed in the digital domain using a full 32Bits of data for D1 quality . No lossy image compression techniques are used, so images with any number of layers are as crisp and clear as they were in the original images. Layers can be faded in and out to variable transparencies at variable rates of speed. Layers can appear and disappear and move around anywhere. All Layers are completely adjustable. Movement of images/layers can be anything from linear to smooth with adjustable acceleration and deceleration. Disolves on any layer for any duration.
MultiLayer-ADPro requires ADPro 2.5 and Workbench 2.1
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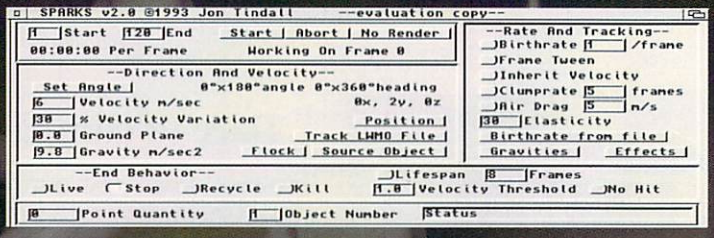

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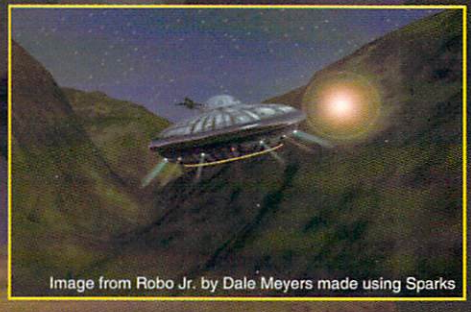

Image from Robo Jr. by Dale Meyers made using Sparks

Now Animators can include "High-End" procedural animation effects to their work. Do in minutes what would take days to set up! Particles can bounce with real world behavior with gravity simulation. Multiple point gravity wells allow bending and directing the stream, flock or swarm of particles. Complete with Wind, Gusting, Flaking and Swirling controls adjustable per axis. User-Definable path allow particles to fall off a moving target, allowing for sparklers, fuses, wands, multi-hit explosions etc. Particles can be replaced by multiple objects allowing for flocking, swarming, arrays, etc. Source position allows you to setup initial state from the vertices of any model! Apply a rotation on any axis procedurally with a powerful expression evaluation feature. Air Drag control allows particles to fall like snow or rocks. Flocking allows a source object to define initial position of objects and a motion file to follow. Objects are held to their positions with adjustable "springs" allowing for external forces to deflect paths individually, yet always returning to their home position. Fade envelopes can be built on the fly with fade in and fade out controls. Displacement mapping support will give motion to all your objects at once.

You have complete control over:

- Origin - at each frame
- Gravity - Bouncing on ground plane
- Wind, Gusting, Flaking, Swirling behavior
- Multiple Local Gravities
- Rotations - evaluate user-defined expressions!
- Spacing - user-defined birthrate
- Quantity - particle/models
- Multiple Replacement Objects
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- End Behavior - stop, recycle, kill-
- Direction - interactive GUI
- Source and Target positions - set start positions by a models vertices
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- Sparklers, Flocks, Magic Wands
- Waterfalls, Explosions

RETINA

Beyond AGA Graphics to True 24 bit Workstation Graphics on your Amiga/Toaster

The Retina display adapter from MacroSystemUS is the high-resolution and 24 bit answer for all Professional Amiga/Video Toaster applications. Now with the Retina, not only can you render high resolution 24 bit images, paint real-time in 24 bits with TVPaint 2.0 Pro or XIPaint at up to 1024x768 screen size, but you can interactively model, draw and design while seeing entire objects and pages on single or multiple screens. The Retina has the ability to display any AmigaOS compliant program in resolutions up to 1280x1024 Non-Interlaced and 2400x1200 Interlaced. Professional users will be astonished at the variety of 24 bit resolutions, up to 800x600 Non-Interlaced, or greater than 1024x768 Interlaced. Applications may be launched on their own Custom Amiga screen or on the Workbench screen allowing the user full choice in configuring their working environment! The Retina is a full featured real time AGA chipset emulator using Workbench 2.1. That's not all, the Retina can also run the Workbench in 24 bit depth so that you can display 24 bit Images and 24 bit Animations directly on the Workbench screen! You can run Real 3D at 1280x1024!
The Retina with TVPaint 2.0 Pro is Recommended by NewTek for use with the Video Toaster System.

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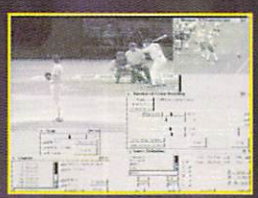

The VLab includes an extensive software control system designed to make digitizing as easy as possible. For the first time building lengthy digital video segments no longer requires expensive and slow frame by frame digitizing.
Using a revolutionary new concept, MacroSystem has provided a new Interleaved Frame Recording feature (VLab and VLab Y/C).
Interleaved Frame Recording or IFR basically allows the VLab to digitize full 30fps digital video sequences to HardDisk by making multiple passes of the recorded video. The VLab will digitize the number of frames specified to either HardDisk or RAM as sequentially numbered frames.

Hardware Features:

- Frame grab in 1/30th sec. or Field grab in 1/60th sec.
- Digitizes full frame full color - NTSC or PAL signals.

Software selectable inputs include:

- VLab - 2 Composite inputs.
- VLab Y/C - 1 Y/C & 2 Composite inputs.
- VLab 1200 - 2 Composite inputs.
- Time Base Corrector not required.
- Compatible with the Video Toaster, OpalVision.
- VLab control windows allow you to keep multiple critical controls open at the same time. And the monitor window display lets you see exactly what you are digitizing.
- Real time Color, Contrast, Luminance and Gamma, Luminance, Chromanace controls.
- AGA chip set support.
- Includes ADPro and ImageFX Loader modules.
- Save images in 24 bit, YUV, or AGA.
- The VLab is supported by many popular Graphics programs.
- Supported by the Nucleas Personal SFC.

Features:

- 15 - 80KHz Hor. Freq. and 50 - 110Hz Verti. Freq.
- 800x600 24 bit Displays in either Non-Interlaced or Interlaced resolutions. 640x480, 768x482, 800x600, 1024x768
- Programmable Resolutions up to 2400x1200 - 1152x862 in 24 bit
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SLICES

A Grab Bag of Tips

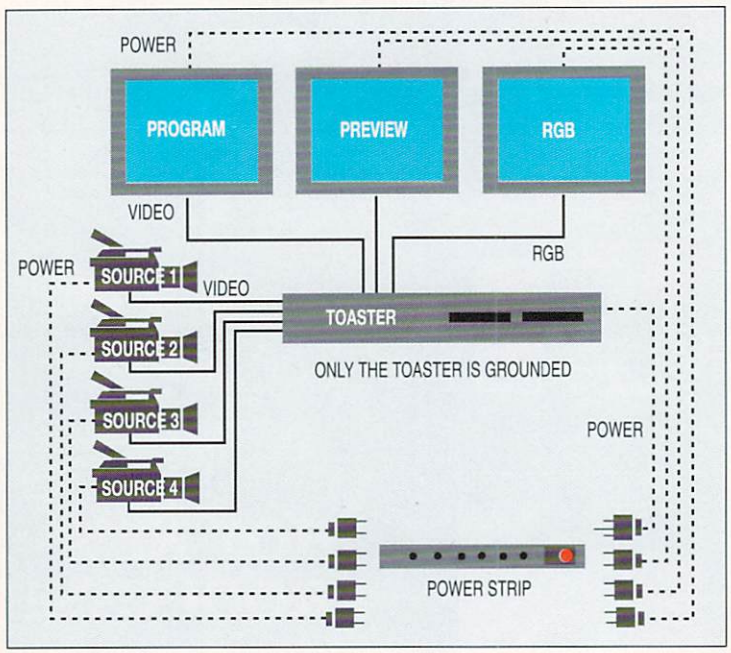
Eliminating Cross Talk, Morphing and More

By James Hebert

You're in the middle of an important edit session. As you load a CG page to your preview bus, you see an annoying flicker on your program output. Some people think this cross talk is "the nature of the beast" when it comes to the Video Toaster, but I'm here to tell you that the problem is easily solved.

Cross talk between Toaster inputs can always be traced to a grounding or termination problem in the system. These usually appear as one image bleeding into another, or more commonly, as a slight flashing on your program display as an image is being loaded into preview.

To check if this is the problem, select black as your background color in the Setup screen. (Toaster Prefs on 2.0 systems.) Load color bars into your preview bus. These can be found on bank "F" on all systems. Watch for a slight flash on the Program bus as you load the bars load. After they are loaded, can you see the bars bleeding through to the program material slightly? This is usually most apparent when the program material is dark. Most people won't see any problem.



Avoid contact between power and video cables. If cables must cross, arrange them at right angles for as little contact as possible. Attach only the Amiga/Toaster to ground. All other units in the system should be ungrounded. Use good quality video cables (not RCAs with adapters) and a standard monitor cable with no monitor extension cables, or switchboxes.

The Toaster's Internal Terminators

The Toaster has four internal terminators, one for each of its video inputs. You may have seen these four switches in your Setup screen. (Toaster Prefs on 2.0 systems.) These should always be set to the "on" or depressed position unless you have an "I" connector on the back of your Toaster to pass the signal elsewhere. If you switch these to the "off" position, you'll notice that your output becomes too bright, and the colors become oversaturated.

The first step in checking a Toaster for termination problems is to inspect these internal terminators and make sure that they are on. Next, examine your video cables. Are you using RCA cables with BNC adapters? These cables can cause all sorts of output problems. You should always use the best cables you can get. It's hard to understand why people go to the extremes of keeping all of their equipment in perfect running order and then lose all sorts of video quality by using cheap audio-style RCA cables for video cabling.

Make sure that your video cables aren't wrapped around your electrical wires, as this can add noise to your video signal. This might come as a surprise to those of you with a big spaghetti wad of wires hanging down behind your desk. Any time these cables cross, they should meet at a right angle to keep contact to a minimum.

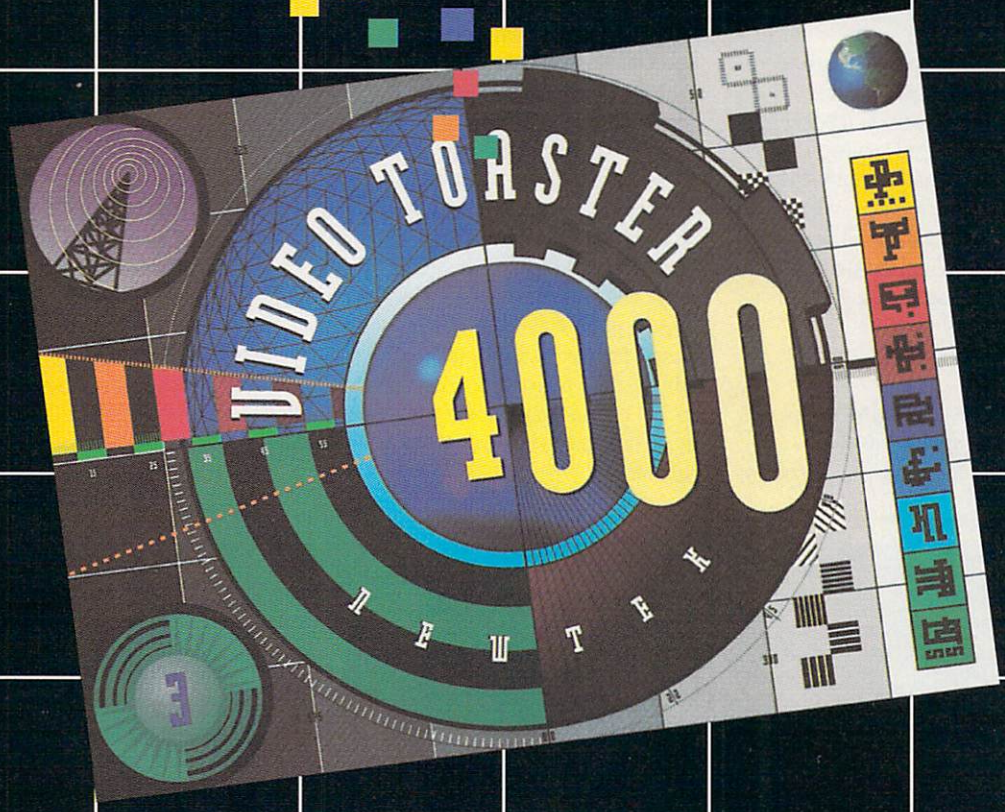
Another common problem can occur if you roll over a video cable with your chair. This can add all sorts of capacitance to that area of the cable and cause a break in the shielding. Check your cable ends to ensure that you have a good ground contact. Any cable with an intermittent problem should be replaced.

Finally, check your video monitors. If they have a termination switch, it should be in the "on" position if the monitor is the last thing in the signal path, or the "off" position if you loop from your monitor to elsewhere in your system. Termination issues are usually fairly easy to track down and fix.

Ground problems can sometimes be more difficult to trace. They tend to manifest themselves in much the same way as termination issues. One symptom unique to ground problems is 60-cycle hum. It usually appears as a vertical bar of slight distortion that rolls horizontally across your monitors; you will usually see it on all three of them. This is usually caused by problems with your electric feed and can sometimes be traced to one of the units within your system.

Disconnecting your video inputs one by one is the best way to find out if one of these units is causing such a problem. If you disconnect all video inputs and the problem persists, it's time to try another approach. The easiest method to trace these problems involves using two multi outlet power strips. Place a ground lift (three-to-two prong adapter) on one of the power strips. This causes the power strip to become ungrounded. Plug your computer into the grounded circuit and everything else in the system into the ungrounded one. Try the experiment described above. If you still see disturbances, you could have a problem with your electric service or computer's power supply.

A good power conditioner should clear this up. I'd suggest you look at a product like the Juice Goose at a music store. These are designed to keep high-power amplifiers quiet in circumstances where house power is noisy. Power conditioners designed for use



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with computers probably won't do the trick here. If it's not your electric service, have a Commodore service center check your computer's power supply.

Under most circumstances, you won't see the problem after moving to the two power strips. You can now move items one by one from the ungrounded strip to the grounded one. After adding each unit, recheck to see if the problem returns; it is likely that one of the items will cause it to return. You can use the ground lift on this unit as a temporary fix until you get a chance to get the unit serviced.

It is common to see slight disturbances occasionally on your video output. These can be caused by sudden drops in voltage feeding your computer. This is the type of problem that a computer style power conditioner can help with.

By following these simple steps, your video output should look rock solid. Don't accept any cross talk as normal. With a little detective work you should be able to solve any cross talk problems.

Tips to Try

Tracking down and correcting cross talk problems isn't the only tip I have for you.

If you ever need to create a series of ToasterCG Backdrop pages that contain color gradient spreads but no text, say as a background for other elements, beware of this ToasterCG quirk. All ToasterCG pages are Key pages until you assign them to another page type. If you change the page type but enter no text on the page, when you save the book it will be saved as a default Key page. Thus, it will always reload as a Key page when you reload the book.

The trick is to change the page type, then enter a few blank spaces as the text for the page. The spacebar is a valid character in the keymap, therefore ToasterCG saves both the blank text with the page type in the book file. Of course, when you load this book at a later date, it will retain its page type settings.

Another handy tip about the ToasterCG deals with accessing hidden characters. There are a lot of additional characters in the keymap for ToasterCG.

Try this on a blank page. Hold down the Alt key and press every key, moving along the keyboard from row to row. You'll discover the copyright symbol, registered trademark symbol, the British Pound symbol, the paragraph symbol, several alternate characters with diacritic marks and more.

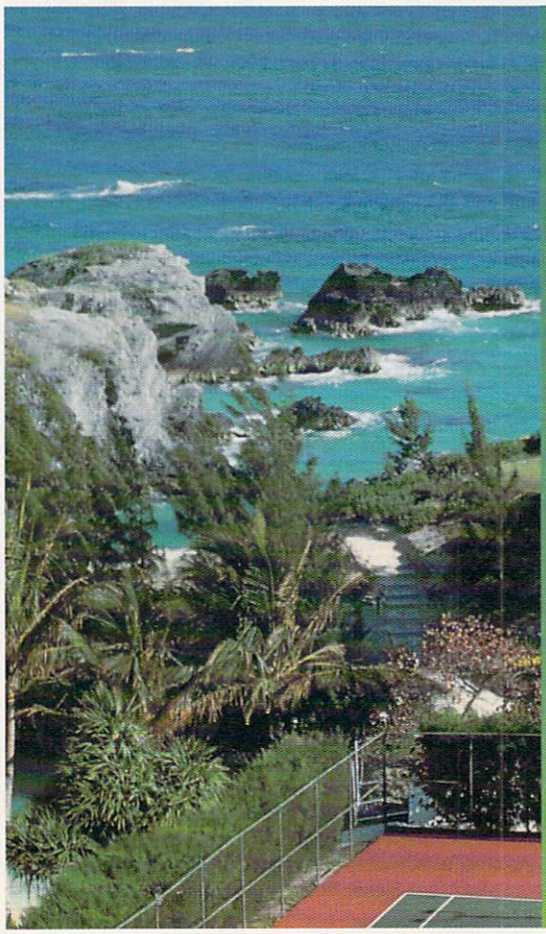
If you access the dead keys (a term that refers certain typographic characters), you'll find even more. The dead keys call up characters like à, é, î, ö, and more.

To get to the dead keys, hold the Alt key and press the f, g, h, j, or k key. Nothing will happen on-screen. Let go of the Alt key, and press a, e, i, o, u, y or n. Now you'll see the character you've entered. Alt-f creates a forward-leaning accent (´), Alt-g a backward leaning accent (`), Alt-h creates a caret (_), Alt-j creates a tilde (≈), and Alt-k creates an umlaut (¨). These keys will not add diacritical marks to just any letter, only those that can and should accept them.

When I find everything hidden in the ToasterCG keymap, I'll print the chart here in Slices. Watch for it next issue. It also appears that not all of the fonts in the ToasterCG font library contain characters for the dead keys, which is due to either laziness or sloppy design. I'll work on this to discover which fonts do and do not support this useful feature.

LightWave Tips

LightWave Modeler has a little-known but powerful feature that was added immediately before the release of the Toaster 4000 last year. The majority of the Modify tools can be con-



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trolled via the mouse or a numeric panel. The problem for users was the difficulty in figuring out the necessary values to manipulate an object. Doing the same thing with the mouse was equally unmanageable.

Well, fret no more. Now you can eyeball the operation with the mouse to get close to your goal, click Undo, then select Numeric. The values that you generated by moving the mouse are now entered into the numeric panel, including the axis you used. All you need to do is change those value to the desired numbers and click OK. Modeler will manipulate the object exactly as you desired.

For example, create a disk and extrude it into 10 sections. Now select the Bend tool, click Numeric, and study the panel. It's difficult to tell what results you'll get. Exit the panel and looking down one end of the tube, bend it with the mouse. Click Undo, then click Numeric and study the panel again. The selected axis, and the numbers entered into the data fields, reflect the exact mouse manipulation you performed a moment ago. If you needed to bend the tube at precisely 47.5 degrees, but couldn't work out the values, you could now enter 47.5 degrees in the Angle field, knowing that the Axis and Direction values were correct.

Morphing Tip

If you design objects in Modeler with the intention of morphing them in Layout, there is a way you can incur a minor but irritating bug. There's also a simple work around. Morphing requires a source object and a target object (or multiple target objects). Each object must share the same number of points as its predecessor. The simplest way to model morph objects is to make one, copy it to another layer in Modeler and then modify the second.

However, the act of cutting and pasting objects in Modeler causes their *point order* to be lost. This mix-up in the order of the object's points causes the wrong relationship between the source and target objects. The morph will go haywire in Layout with polygons horribly twisted.

The solution is to create the first object, then save it to disk. Now go to a new layer, load the saved object and modify it. Again, save it to disk. Do the same for each target object. When you load the objects into Layout, their point order relationship will be maintained.

A similar point order problem occurred in the 3.0 Modeler macro called Path to Motion, which converted a curve into a motion path. The point order of the curve was somehow lost in the conversion, resulting in a motion path that jumped all over the original curve. There is no work around, but this problem has been corrected in the update.

Finally, here's an undocumented saving option in Modeler. Have you ever wanted to save an object in progress with different pieces in different layers? You can using the following steps: Select each layer that you wish to be saved. Hold the Alt key on the keyboard. Click on either the Save or Save As button. Enter a filename as usual and save the object.

Note that this form of object can be loaded into Modeler only. You cannot load it into Layout because it is not a true object. It is a in special format usable only by Modeler.

To load a layered object, simply choose the Load button and the filename. Each layer will receive the portion of the saved object that it held originally.

Fade To Black

That's all for this month's Slices; next issue, I will explore other opportunities for getting the best performance out of your Video Toaster system.

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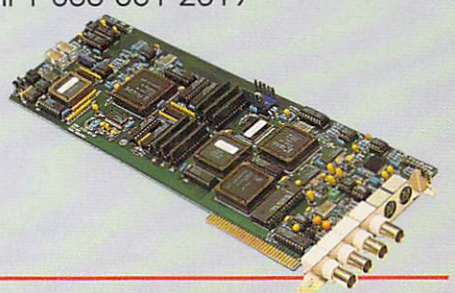

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SOUND REASONING

Up Close and Personal

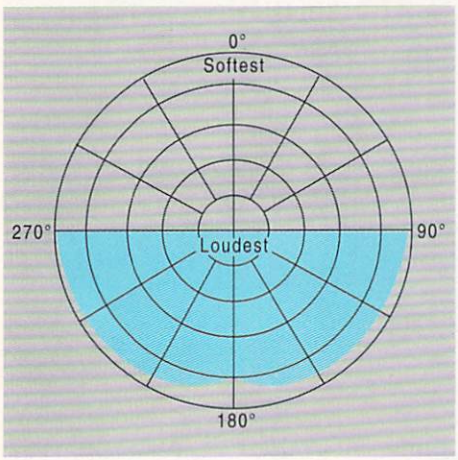
The Secret to Micing Success

By Cliff Roth

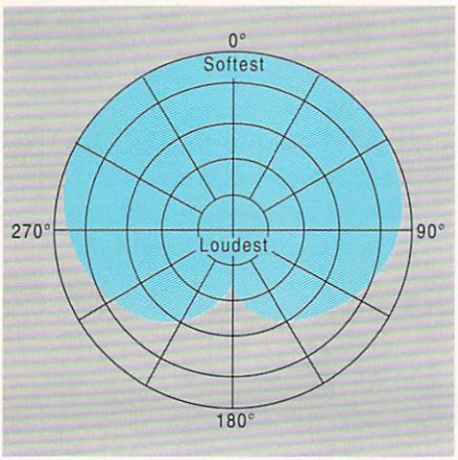
Microphone technology reflects a fuzzy and subtle art. Unlike the dazzling video effects that the Toaster offers, which are for the most part unavailable anywhere else for as little money, with microphones a $2,000 model performs pretty much the same function as a $20 model.

Of course, the more expensive version offers more accurate conversion of sound to electricity, but the difference can be surprisingly slight. It's not like a fancy microphone offers more buttons, functions or features. All microphones do just about the same thing.

Far more important than which microphone you use is how you use it. Proper microphone technique gets you into the ballpark where the differences between microphone models begins to become apparent.



The omni-directional polar pattern.



The uni-directional (cardioid) polar pattern.

The most important rule in all microphone use is to place the microphone as close as possible to the sound source being recorded without getting so close that the sound overloads the microphone's delicate diaphragm and causes distortion.

For people speaking or singing at average volume, the best distance is usually about eight to 12 inches from the mouth. The microphone should be placed so that the talent speaks across the microphone's front surface (parallel to the diaphragm), rather than directly into it. This placement will help prevent the popping "P" and sibilant "S" sounds.

Pickup Patterns

All microphones have a characteristic pickup pattern that describes their directionality. In other words, most microphones are more sensitive to sounds that are in front of them than sounds that come from behind. The pickup pattern diagrams illustrate these variations in sensitivity.

An omnidirectional microphone picks up sounds from all directions equally; thus, it lacks directionality. The main advantages of this pickup pattern are that you don't have to worry much about which way you point it and there are no strange off-axis coloration problems (explained below). The disadvantage is that an omni microphone tends to pick up more extraneous noises.

A directional microphone's pickup pattern looks like an elongated heart shape. For this reason, it's also commonly referred to, in audio engineering jargon, as a cardioid microphone. Its chief advantage is its ability to diminish background noises without much sound coloration (see below).

Super-directional and hyper-directional microphones provide increasing directionality—the heart-shaped pickup patterns become more elongated. They're also called super-cardioid and hyper-cardioid. A shotgun microphone is a hyper-cardioid microphone equipped with a sight, so it can be accurately aimed at a far distance from the subject.

The advantage of these extremely directional microphones is their ability to pick up sounds from considerable distances away—up to 50 feet or more—while ignoring undesired sounds coming from adjacent locations. However, the disadvantages are that they must be aimed with extreme precision, and they tend to suffer from off-axis coloration.

Off-axis sounds are those that come from directions other than directly in front of a directional microphone. When a sound arrives at the microphone from a direction near the border of off-axis and on-axis—that is, the border of the pickup pattern outline— strange things can occur. The exact pickup pattern actually varies depending on the frequency of the sound. Most directional microphones have a wider pickup pattern for low-pitched sounds (bass) and a narrower pattern for higher pitches (treble). Thus, when sounds arrive from slightly off-axis, the level is not reduced equally. There's a tendency for the sound to lose more highs than lows, resulting in a muddy tonal quality.

This phenomenon is called off-axis coloration of the sound. It's particularly noticeable when someone is speaking from slightly off-axis, and the microphone or person moves so that the sound shifts between off-axis to on-axis.

The only way to detect this problem is by listening carefully with headphones during recording. Headphones should always be worn to check for distortion, hum or other problems. Never trust a level meter when making professional audio recordings.

Matching the Pickup Pattern to the Application

Which type of microphone to use for a given application depends on how close you can get to a subject and how much background noise there is.

Under ideal circumstances, in a totally quiet recording environment with minimal acoustic reflections, you'd want to use an omnidirectional microphone at a distance of about a foot from the mouth of the person speaking.

Omni microphones are useful when you need to pick up sounds

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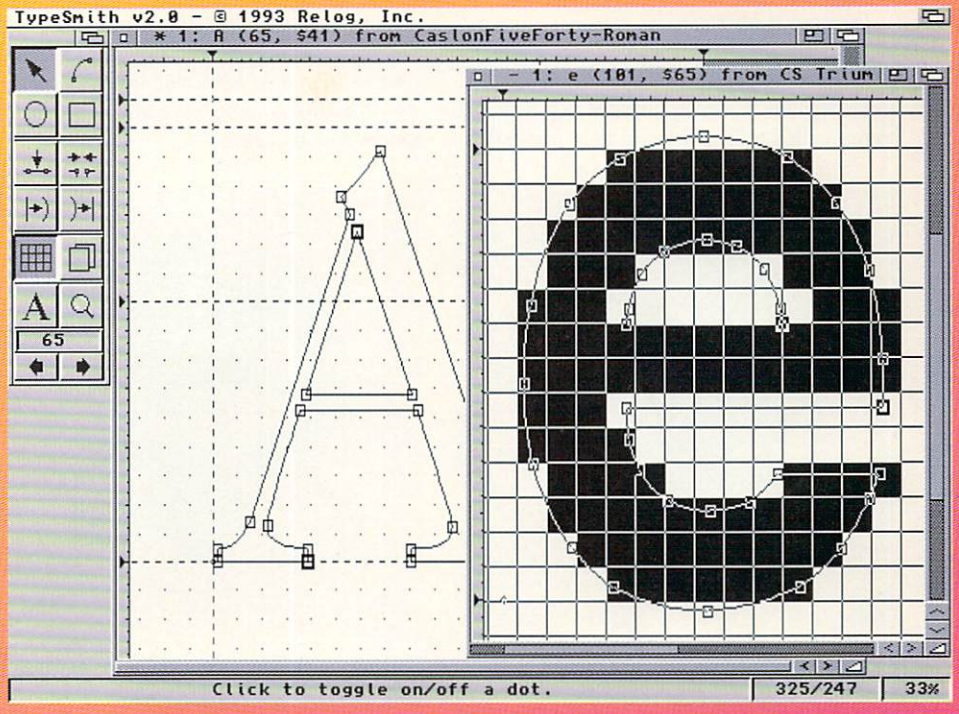

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from different people speaking at the same time, where you lack control of which way the microphone is facing, or where you just want to be sloppy and not have to worry much about pointing the microphone.

But directional microphones are probably your best bet for most applications. They'll cut out some background noise without requiring precise aiming. For example, during a field interview the interviewer can point the microphone back and forth without worrying too much about the aim. In noisy environments, such as city streets, offices, factories and schools, a directional microphone will allow you to get a few feet farther back from the subject, without picking up a lot of unwanted noise.

Directional microphones are also quite useful for dramatic work, where you don't want the microphone to appear in the frame. A directional microphone is usually attached to a handheld boom, called a fishpole, and held a couple of feet above the heads of the people speaking.

The more extreme super-directional and hyper-directional microphones should only be used when the microphone cannot be brought closer than about five or 10 feet from the person speaking if there's no amplification involved. For example, in an auditorium with a public address system, you can often get good sound by placing an omni or directional microphone about 10 or 15 feet from the loudspeaker.

More Microphones

When working at distances of more than 10 or 15 feet from the subject, you may also want to consider using a wireless microphone. If the problem with getting a microphone up close is the cable, a wireless microphone located close to the person speaking will usually provide better results than use of a hyper-directional microphone from farther away. (We'll cover the wireless microphone world in more detail in an upcoming column.)

For news and talk shows where people are sitting down, a tie-clip, lavaliere-type microphone can provide the most convenient way to get the microphone up close. But watch out for extraneous noise from moving clothing and body movements. Such movements are why they're only appropriate for people who keep still.

There are two commonly found microphone technologies: dynamic and condenser. Neither is clearly superior—both inexpensive and expensive microphones are available in each variety. Dynamic microphones tend to be larger. They get their name from the fact that they actually generate the tiny electrical audio signal (like a dynamo). The cheapest dynamic microphones (less than $20) tend to have poor pick-up of high-frequency sounds, resulting in a muddy sound quality.

At this extreme low end of the price range, condenser microphones tend to produce crisper sound with wider frequency response—that's why they're almost universally found as the built-in microphones in camcorders and portable cassette recorders. Because they can be made extremely small, almost all clip-on lavaliere microphones are of the condenser variety. But note that inexpensive condenser microphones can sound tinny, lacking low end, and that they always require power. To get this power, some models have a built-in battery, while others get the power from the device it is plugged into (such as a camcorder or mixing console).

Field Tips

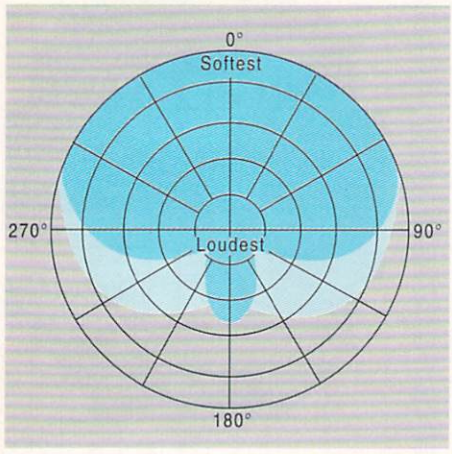
When you're recording in the field, it's usually best to be prepared and bring a variety of approaches to micing with you. When scouting a location, always consider the audio aspects.

For example, if you'll be recording a speech in an auditorium with a camcorder, bring an omni microphone with a long cord, as well as a wireless system. To get the best pictures, you'll certainly want to position the camera much farther from the stage than where you'd want to put a microphone to get the best sound. Ideally, you should be able to mount both microphones on the lectern. If that's a problem, consider positioning a microphone a few feet in front of the PA system loudspeaker or taking a direct feed from the auditorium's mixing console (bring a variety of audio adapters with you).

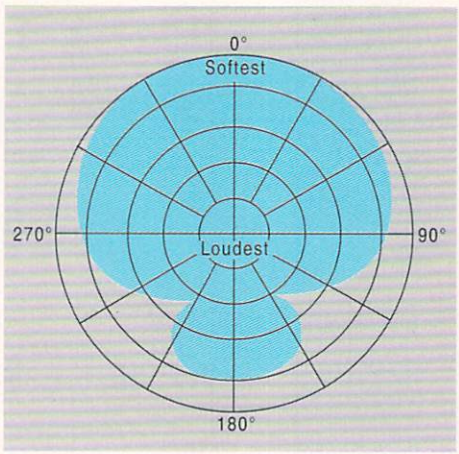
When running microphone cables longer than 10 feet, you'll get much better results with professional three-pin XLR connector microphones and cables than with the cheaper mini-plug microphones and cables. The three-pin XLR (also called Cannon connector) wiring system manages to eliminate hum and other stray noise much better than the two-wire mini-plug system. (This is another topic we'll be returning to in a future Sound Reasoning.)

Choosing the right microphone and wiring (or wireless) setup can be as much an art as a science. Professional recording engineers often spend hours figuring out how to mic a single musical instrument and sometimes even go so far as to record two different versions simultaneously on two different tracks to be able to take advantage of each variation later in the mix.

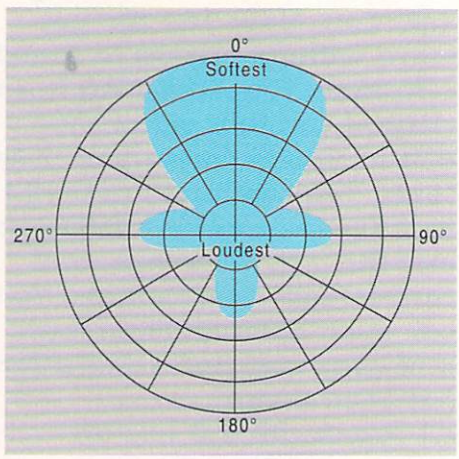
Most low-budget, audio-for-video recording applications don't require such extremes. But whether you're working with thousand-dollar studio microphones or a basic hundred-dollar TV interview microphone, the main principle remains the same: Get as close as you can without distorting the sound.



A comparison of cardioid and super-cardioid polar patterns.



The hyper-cardioid (or super-cardioid) polar pattern gives increased directionality.



A typical "shotgun" polar pattern. When equipped with a sight, the shotgun is used at a far distance.

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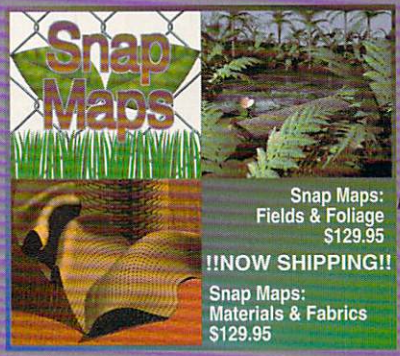

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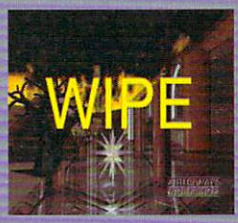

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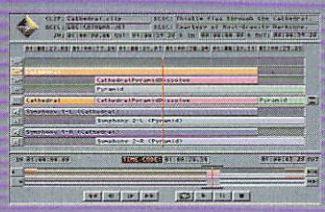

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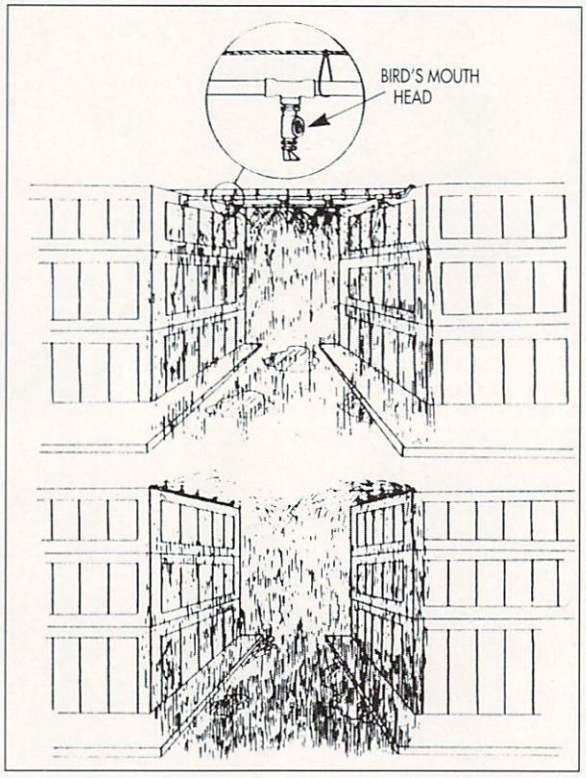
SPECIAL F/X

Rain and Water Effects

Give Your Video Some Splash

By Robert McCarthy

Rain and water effects have always been used by Hollywood to increase production value inexpensively and accentuate mood and atmosphere. Gentle spring showers, massive thunderstorms, floods, or a simple dripping icicle on a winter's night have all satisfied the filmmaker's desire to create an individual and particular reality. It is difficult to imagine certain films without their rain or water effects. For instance, try *Wuthering Heights* without its constant storms, *The Towering Inferno* with no exploding water tower, *Captains Courageous* minus its blustering seas, or the front nine in *Caddyshack* without the furious rainstorm. Though seemingly so simple, achieving water effects requires touch, taste, and timing in addition to a large, extensive variety of highly specialized equipment.



For an overhead rain effect, a bird's mouth rainhead works well.

Equipment Needed for Rain Effects

To do an intensive rain scene, you need the following equipment: overcamera (overhead) rainstand, adjustable hose and nozzles, wet-down hoses, rain mats, manifolds, drip pipes, portable rain towers, sandbags or weights (to secure the towers down), and extra hoses, pumps, mops, and buckets.

Rainstands

Preconstructed rainstands come in 3/4-inch, 1-1/2-inch, and 2-1/2-inch sizes. Normally, 3/4-inch rainstands rise 30 feet high; 1-1/2-inch and 2-1/2-inch rainstands are 30 to 40 feet tall. They are designed to put out tremendous amounts of water covering large areas. The 3/4-inch stand covers an area 50 feet deep by 100 feet wide; a 1-1/2-inch stand blankets an area 80 feet deep by 150 feet wide. The 2-1/2-inch exceeds even that, covering 120 by 200 feet—a considerable area to douse with torrential rain. The stands use about 90 to 110 pounds of pressure on the 2-1/2 inch, 65 pounds on the 1-1/2 inch, and about 60 to 70 pounds on the 3/4-inch. By adjusting the pressure on the individual rainstands, you can control the size of the raindrops. The lower the pressure, the larger the drops, and it's just the reverse for a fine mist.

A good example of rain effects in operation (using 3/4-inch and 1-1/2-inch rainstands) appears in the film *The Return of the Living Dead*. If you watch the scenes closely, you'll be able to detect the use of overhead rainstands. These were positioned above and parallel to the camera, and cast a waterwall out to a distance of 20 to 30 feet in front of the lens. The areas beyond the waterfall were wet down with hoses to maintain the illusion of an overall rainstorm. You'll see everything from drops dripping to torrential rains employed in all kinds of indoor and outdoor situations.

Outdoor Overhead Rainheads

In many cases, especially outdoors, you cannot place rainstands on the ground because they will be seen in the shot. A good solution is to stretch cables between buildings or telephone poles and hang your rainheads and hoses from these cables. If you are shooting a street scene in between buildings, use a spinning head, called a Whirlybird, that covers a 360-degree radius. Most rainheads only give you a 180-degree angle (see Rainheads and Nozzles below).

Rain Mats

Rain mats (also known as horsehair or hog hair mats) are made of a rubberized upholstery padding material. When the water strikes the mat, the sound is dampened, preventing interference with the sound recording. Caution: Always check with the electrician to make sure all electrical equipment is properly grounded and insulated from water.

Fitting Hoses

Putting two differently sized hoses together requires a *hose reducer*. They come in various sizes and can even reduce a 2-1/2-inch hose to 3/4 inch. The brass fittings on the ends of hoses are called couplings. They have rubber washers inside the fittings to prevent leakage. Always check this washer before connecting to any device.

Siamese Outlet Reducer

This is a Y-shaped outlet. It connects a single water supply hose or hydrant to two 1-1/2-inch hoses, thus doubling your outlets. Each has its own separate valve control.

Pipe Threads

Hoses, pipes, hydrants, manifolds, and so on can all be threaded differently depending on their purpose, tensile strength specifications, and design. For this reason it is important to be aware of the standard pipe thread configurations to be sure your equipment connections are compatible. There are three different types of pipe threads:

1. *National standard* is a coarse thread and has fewer threads per inch.
2. *SIPT* stands for straight iron pipe thread.

3. *Pacific coast pipe thread* is a finer thread and has more thread per inch.

Rainheads and Nozzles

Here is a list of some of the many different types of rainheads:

1. Bird's mouth head
2. Quick-release 1-1/2-inch fog nozzle
3. Boston nozzle
4. Whirlybird heads (because they spin around, they're good for street scenes, when the entire street must be covered)
5. Water rings (on wind machines, these give great hurricane effects)
6. Water wands are used to fill a specific area missed by a rainstand or for foreground rain directly in front of a camera
7. 1-1/2-inch Fog nozzle

Manifolds

A manifold is a device with a large opening (of 1-1/2 inches or more) that feeds a number of smaller outlets through control valves. For instance, a 2-1/2-inch main on the manifold feeds four outlets of 1-1/2-inches each. Then 1-1/2-inch hoses are attached to four 1-1/2-inch manifolds and in turn are further reduced to six 3/4-inch valve-controlled outlets on each manifold. Six 3/4-inch hoses are then run to individual 3/4-inch rainstands.

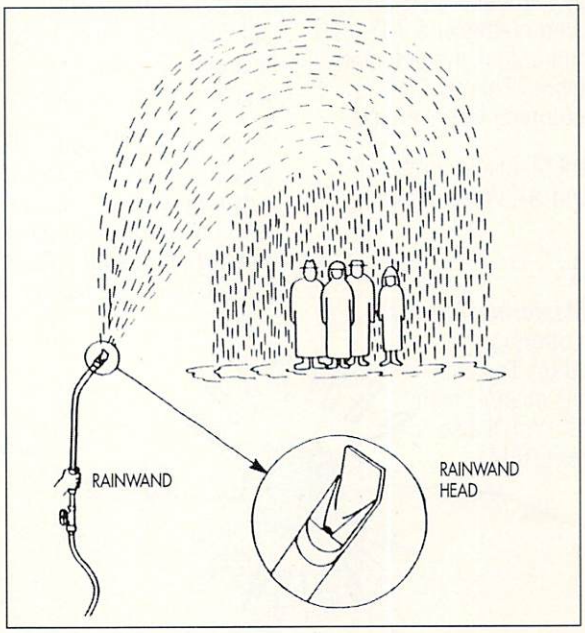
Setting Manifolds

Manifolds have one master valve that controls the flow of water into them. They also have subvalves that control the flow of water out of the manifold into the individual rainstands or into other manifolds.

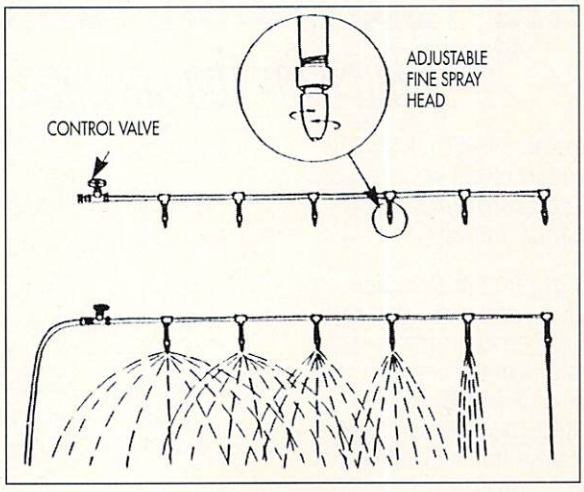
Manifolds should be set so they can be individually manipulated. In this way, you can control the water pressure. This is important when you're making rain because different areas of the set may require different types of rain. For example, one area might require a light rain with large drops while another needs smaller drops, but heavier rain. These valves allow you to preset each section to the director's specifications.

Eddy Valves

The Eddy valve controls the flow of water from the hydrant to the hoses and manifolds. When creating water and rain effects, use the Eddy valve on the fire hydrant. The fire department of the city where you're working can usually supply it. Usually, the water flow is controlled by a 2-1/2-inch line on one side of the valve and a 1-1/2 inch on the other, with both lines controlled individually by valves. Most fire hydrants have 90 to 150 pounds of pressure per square inch. There are primarily three sizes of hose used for rain and water effects: a 2-1/2, 1-1/2, and 3/4 inch.



Water wands are used to fill an area missed by a rainstand.



For rain outside a window, mount a fine spray bar above the window.

Hardware and Tools Needed for Rain Effects

To create various rain effects, these are the types of equipment used most frequently:

1. Eddy valves
2. Gate valves
3. Ball valves
4. Spanner wrenches
5. Universal spanner wrenches
6. Pumps
7. Hoses

Gate Valves

You can put as much pressure as you want on a Gate valve, whose mechanism works similarly to a guillotine. It rises up and down, closes the water on and off, and regulates the amount of water going in and out of the hose.

Ball Valves

The Ball valve employs a convex ball that rotates left and right to allow water to exit. This rotation seals off or opens to a concave inlet adjacent to the inflow. Water must be fed gradually as a sudden pressure surge will damage the seal.

Caution: When holding a fire hose for wet downs or backup on areas where your rainstands cannot reach, be aware of the tremendous amount of water pressure coming out; it can be anywhere from 100 to 125 pounds. It will take all you've got to hold that hose, and if you let go while it's open, it will whip around like a snake and break your legs. Always put two people on a water line during hosing down, especially if you're using over 80 or 90 pounds of pressure.

Spanner Wrench

The Spanner wrench is a special tool used for tightening or loosening hoses. The notch on the end grabs the brass fitting when you turn it. You may need two wrenches, one on each side of each hose you are connecting or disconnecting. By turning them in opposite directions, you tighten or loosen them.

Universal Spanner Wrench

Universal spanner wrenches open and close fire hydrant valves.

Pumps

Many situations require a water pump to deliver water to the rain set from a pool, stream, lake or reservoir. Pumps come in sizes ranging from 1/2-inch to 6-inch outlets, depending upon your needs, and are operated by gasoline or electricity.

Naturally, a quality water pump should be used. In addition, a one-way foot valve protects the prime on the pump by preventing the water from draining back into the supply when the pump shuts down.

When drawing water from a source, always put the pump as close to the water as possible. Remember, it's easier for a pump to push water out than it is to suck water up. You'll ensure better pressure this way.

Hoses

A suction hose used on a water pump is a hard non-collapsible hose. If a fire hose were used as a suction hose, the minute the pump was primed the hose would collapse and prevent water from entering the pump.

Output hoses are attached to the manifold. A regular fire hose is used in most cases, usually 2-1/2 inches in diameter.

When pumping from a water supply, there are three potential problems. You could lose water pressure because you've lost the prime, or suc-

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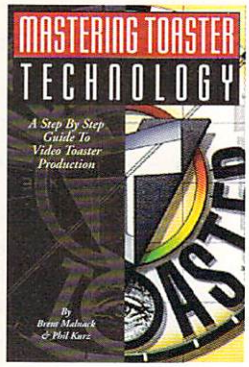

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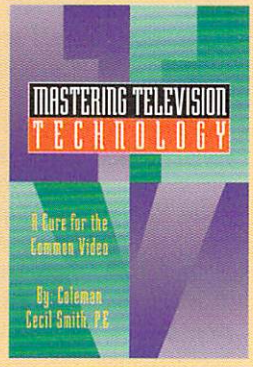

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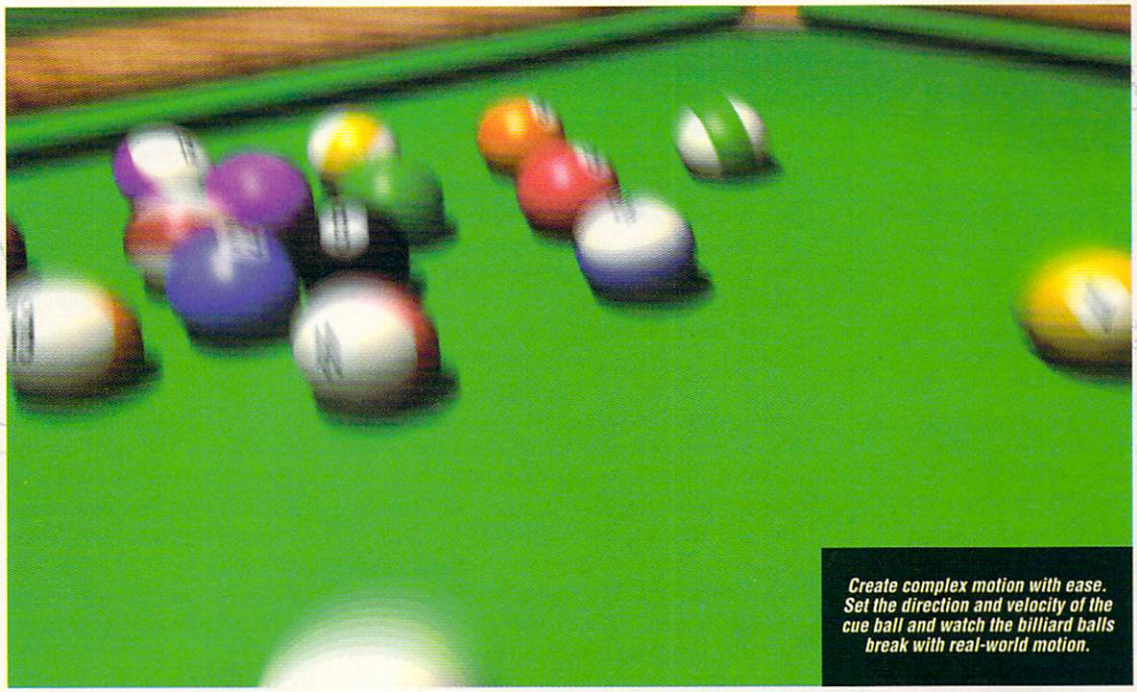

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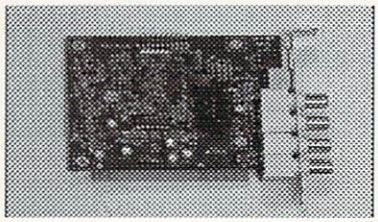

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tion, on your hose; or, you could lose revolutions on the pump; and sometimes, a hose can pick up something that will block it.

Always put a wire basket on your suction hose to prevent sediment or loose debris from being sucked into the pump and damaging it or blocking the hose.

When using fire hoses, especially on mains, make sure you use a quality, double-wall hose. A ruptured line can flood the equipment, or if it has enough pressure, can cause it to whip around, possibly injuring your co-workers. Remember: water and electricity don't mix.

Valve Control

It's important to always turn valves on slowly when charging lines for the first time. A surge in pressure can easily break a hose or snap off a rainhead or a rain tower. Exercise extreme caution in turning on water supplies, especially when drawing from heavy-duty pumps such as fire trucks, water trucks, hydrants and similar devices. Most pumps produce 150 pounds of pressure, ready and waiting when you start; some water trucks actually pump up to 600 pounds of pressure! So turn the main valves on slowly. After you have set all the individual rainstand valves to their required settings and all the lines have been charged with water pressure, an *instant-on* ball valve can be used to provide rain on cue.

Water Supplies

Many locations have no fire hydrants, so imagination, common sense, and originality are required to create alternative sources of water pressure for rain and water effects. Alternatives can be a nearby lake or river where a pump can be used to supply the water. Water trucks, fire trucks, and portable tanks are frequently used. You can also create a water reservoir with a portable pool, or even more basic, a hole in the ground filled with water.

Rain Outside A Window

To achieve a rain effect on a window that is to be viewed from inside, there are several things you must do:

1. Seal the window with silicon or caulking to prevent water from leaking in from the window onto the set.
2. Use a drip pipe or spray nozzle overhead.
3. Use a small spray nozzle on the window itself.
4. If heavier rain is required, employ an overhead rain device such as a 3/4-inch rain tower or a water wand.
5. Have a catch basin to collect water from the window.
6. Lay a rain mat in the catch basin to act as a silencer, dampening water noise and minimizing interference with the sound recording. Another way to quiet raindrops is with liquid soap. Suds on the water surface provide a cushion that stops the sound of rain dripping.
7. Use a siphon pump to re-circulate the water from the catch basin back to the rain device and down again.
8. Install a hose to fill and later drain the water from the catch basin.

Rain On A Moving Car

Sooner or later you may want to rig an automobile for traveling in the rain. Try the following procedure.

Install a water pressure tank or a Hudson sprayer in the trunk of the car. Run a hose from the trunk to the top of the car and then to a spray nozzle and small pipe manifold mounted on the roof above the windshield or windows. The manifold adjusts the water flow. Suction cups, clamps, or gutter mounts hold these setups on the roof. A pressure gauge and a regulator allow adjustments for the proper water pressure. The biggest problem will be not having a long time to execute the shot because of the limited supply of water in the trunk. A larger tank can be made to fit the job and pressured with air or inert gas. Another method is to use two or more Hudson sprayers in tandem.

Heavy Rain on a Moving Car

In most cases, the car will be on a trailer or being pushed or pulled with a bar mounted on a camera car that's either in front, behind, or alongside. The F/X vehicle is separate and equipped with a large supply of water and a rainbar. The rainbar will be extended on an arm over the front of the car or wherever necessary.

Heavy Rain on Long Shots of a Moving Car

This shot is predominantly(but not exclusively) done from the interior of the car, shooting outward. If the scene is of a car moving along a road through a torrential downpour, you have a lot of work to do. Rainstands must be set up on the roadside opposite the camera.

We did this successfully in The Return of the Living Dead for a 1,500-foot long shot. It took an entire day to set up. The script asked for a high shot of 50 feet, so we used a 60-foot crane (with 1-1/2-inch rainheads) to put the rain effect above the camera crane. Seeing raindrops falling on actors from such a great height was tremendously effective.

Heavy Rain

Many rain scenes require rain to turn into a hurricane or heavy storm. In this case, use a wind machine, such as a Ritter or a Red Bird with a rain ring on it. A lightning machine can also be added. The placement of heavy duty rain and snow machines is determined by weather conditions and, of course, the desires of the director.

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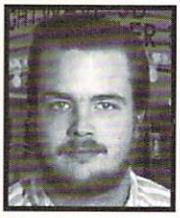
TAMING THE WAVE

Boolean Operations

Creating a Slot Machine with a Virtual Sander



By David Hopkins

This tutorial is the result of a project I recently completed. We're going to build a slot machine much like the one you see in Figure 1. The coolest part about this machine is that it actually works! Be forewarned, to complete this tutorial you will need LightWave 3.0 or the Toaster 4000.

Because this is a complicated model, we'll cover the steps to building it in two columns. This month, you'll learn how to create the initial objects and explore the use of Booleans, the primary design tool. Make sure to keep the objects in a safe place between installments so that you'll be able to successfully complete this tutorial.

Enter LightWave and use Clear Scene. Move into Modeler and click New. We'll need lots of room for the Boolean operations, which were newly added to Modeler 3.0.

Figure 1

Using Booleans amounts to using a geometric shape to carve another geometric shape. Begin by making a box the rough size of our slot machine. Get into the habit of making a block the shape of your object whenever you model, then chip away the unwanted parts.

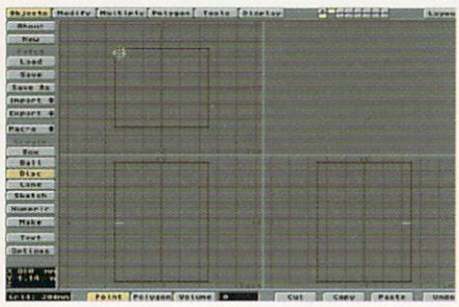


Figure 2

Make sure the Modeler measurement system is set to LightWave's standard metric by clicking the Display Menu, then Options. In the bottom left corner of the pop-up panel find the Unit System buttons. Click SI, then click OK. This way my measurements and your measurements will be the same.

Click on the Objects Menu button. Click Box, then Numeric. This lets us enter the size of the box quickly and accurately. Set the Lows, from top to bottom, to read -.5, 0, -.5, then set the Highs to .5, 1.5, .5. Units should be set to M (for Meters). Click OK, then click Make to generate the box.

The slot machine bounding box is 1 meter wide (X), 1.5 meters tall (Y), and 1 meter deep (Z). I usually build objects to scale, but slot machines do come in all sizes, so I'll scale it when I'm done.

Next round the corners of the object. Go to layer 2 by pressing the 2 key on your keyboard, then put layer 1 in the background by pressing ALT 1. You should see our box drawn in black. If you don't, try it again.

Now we'll make a little gadget that I like to call a sander, a shape we'll use to cut or sand an edge or corner. Click the Disc Button, then Numeric again. We aren't going to enter the size of the disc (although we could), but we're going to change the number of points used to make up the disc.

Change the Sides value to 32 so that our work is smooth. Sides is found as the first field in the Disc options. Next, set Bottom and Top to 0 so that the disc sits at Y = 0, the base of our slot machine. Click OK. When you return to Modeler's three views, click in a blank space to the left of the views. This will remove the projected disc outline that Modeler determined from the settings in the window. We'll define the size of our disc manually.

In the view labeled Top, move your pointer until the values in the Coordinate Window in the lower-left corner read X= -500mm and Z= 500mm. This will be the upper-left corner of the disc. Click and drag down to the right until the coordinates read X= -400mm and Z= 400mm. Release the button. Try to be careful when you release the button so that you don't nudge the mouse in the process. Your screen should look like Figure 2.

Click Make and then click again in one of the blank spaces on the edges of the screen. Press Shift A to cause our new disc to fill the three views.

Next, remove the polygon and leave the points. Make sure you are in Points Select Mode (at the bottom of the Modeler screen). Using the right mouse button, draw a lasso around the points in the view labeled Face. They should all become selected. Now click Cut, then Paste. Now only the points exist in this layer.

Using the lasso technique, enclose all points except those from the 9 o'clock to 12 o'clock positions in the Top view. You should have 23 points selected. Click Cut to remove them. This leaves a 90-degree curve. Press Shift A again to fill the views.

We need to add one point. Click on the Polygon Menu button, then the Points button near the top on the left. Place your crosshair over the upper-left corner of our box in the Top view (X= -500mm, Z= 500mm) and click.

A large crosshair appears and the lines should sit on top of our black background lines. Now, in the Face view, click on the yellow line where it crosses the existing line of points (Y= 0). This puts our new point on the same flat plane as our others, providing the requirements for a flat polygon. Press the Return key to create the point, click Points Select mode to exit the point creation mode and click a blank area (or press the /-key) to deselect the point.

Now, you will see what we're up to. Using the Top view, select the points in a clockwise direction. It doesn't matter where you start but make sure you follow a continuous clockwise direction. When all points are selected, press the P key to make a Polygon. You should now have a square with a cutout curve like the one in Figure 3. This is our sander. Now we'll move it a little to allow for a clean Boolean cut.

Click the Modify Menu button then Move. In the Top view, click and hold the left mouse button and push the entire object up to

Taming the Wave Continued on Page 50

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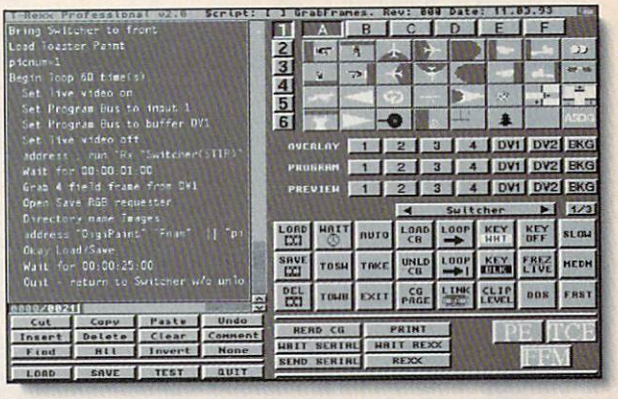

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the left (X= -1mm, Z= 1mm). This puts the ends of the curve outside of the boundary of our box.

Now, we'll move our sander below the bottom of the box to provide for a clean Boolean cut. If two polygons are on exactly the same plane, one facing one direction, the other facing the other (as would happen if we simply placed our sander at the bottom of the object), Modeler's Boolean functions may become unpredictable. Modeler doesn't know which polygon is more important, so it usually suggests that you move the object a little bit. We're just doing it safely from the start.

Click on the Stretch button, then Numeric. Because we want to move it about 1mm below the bottom of our box (which is at 0 on the Y axis), set the Y Center to be -1 and the Units to be mm. Now, set the Y Factor to 0. Modeler now has been told that the temporary center of the Y axis is located at -1mm. Since a factor of 1 means that an object (or dimension) is full size, a factor of 2 means double size, and a factor of .5 means half size. Setting the factor to 0 means it is perfectly flat at the center of the world, also known as -1mm. Click OK and that's exactly where our sander will end up. Press Shift A again to see its new position up close. You'll get the hang of it, don't worry.

Now we'll stretch the sander to carve the entire height of the edge. Click the Multiply Menu and then Extrude. Click Numeric. We know that our box is 1.5 meters tall, so make sure that the Axis is set to Y to extrude in the proper direction. Set the Extent to be 1.502 (the box's height, 1.5 meters, plus the 1mm that it sits below the object, plus one more millimeter that extends above the box.) Make sure that the Units are Meters, click OK, and Make.

Press the A key to see the entire layer. Place the cross hair on the curve in the Top view and press G to center the curve in that view. Next, use the > key to zoom in on the curve until it fills the view. We need to make sure that the polygons just created by extruding are facing the correct directions. Shift to Polygon Select mode at the bottom of the screen and click on the top edge as seen in the Top view. You should see a dotted line extending towards the top or bottom of the view from that polygon. This is the polygon normal and illustrates the direction from which the polygon is visible. If it is pointing up, all of your polygons face the correct way. However, if it points to the bottom, the entire structure is inside out. If you followed this tutorial exactly up till now, it points down.

Click in a blank area or press the / key to deselect the polygon(s). This is very important because we are going to use the Flip command to turn it inside out. If you have any polygons selected, only those will get flipped. Once they are deselected (the number at the bottom center of the Modeler screen should be 0), press the F key to flip them over. Try the test again by clicking on that same edge at the top of the Top view. The normal should now face up. Deselect the polygon(s) by pressing the / key.

Let's name our surface parts. Actually, we'll only use one name for the surfaces of both objects because the part that gets carved retains the name of the surface that carved it. Click the Polygon Menu item then Surface. In the field at the bottom of this pop-up window, type Slot Machine Body and hit return. That surface name has now been applied to all the polygons making up the sander. Go to layer 1 by pressing the 1 key and click Surface. The name we want is the same, so click Apply. Now both parts are built entirely of a surface called Slot Machine Body. Save both pieces.

In layer 1, click the Objects Menu and then Save As. Name the object SlotBoundingBox.lwob and hit return. Go to layer 2 (press the 2 key) and click Save As again. Name this one SlotBodyEdge.sndr. SNDR is an extension name

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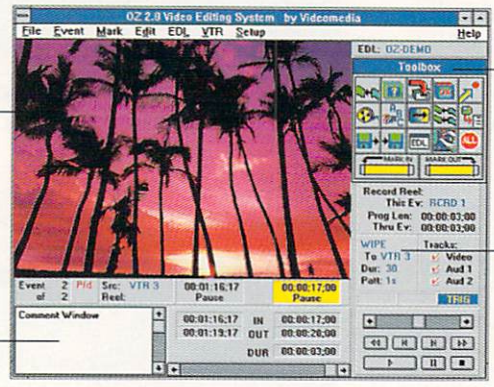

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toolbox User friendly icons provide instant tools to speed your editing.

transition information Select Toaster wipes, dissolves, DVE and character generator.

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to remind us that a file is a sander rather than an integral piece of the object.

Now we'll set the sander to work on all four vertical edges on our slot machine. Make layer 2 the foreground again by pressing the 2 key, and make layer 1 the background again by pressing ALT 1. Press the A key to give you a full view of the situation. Click the Multiply Menu button and then Mirror. Click the pointer dead center in the middle of the box as seen in

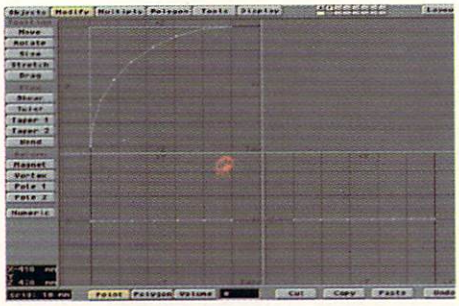

Figure 3

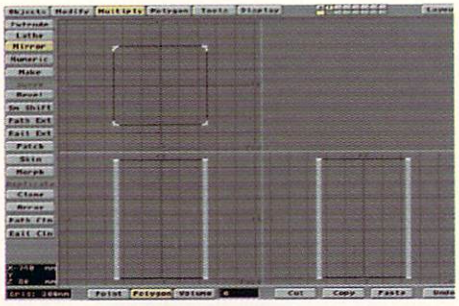

Figure 4

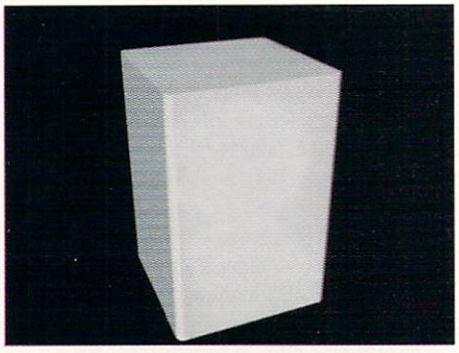

Figure 5

the Top view (X= 0, Z= 0) in such a way that the resulting yellow line runs along the Z axis (vertical in the Top view). Make sure that it is indeed at 0 on the X axis and then click Make. A mirror image of our sander should now be visible on the upper right corner of the box in that view.

Now, place the mirror in the same place, but make the yellow mirror line run horizontally on the X axis (Z= 0). Click Make again, and you now have a mirror image of your two sanders on the opposite side of the box. Your screen should look like Figure 4.

Press the ' key. This is another handy new trick that automatically takes whatever foreground layer(s) you had selected and swaps them with the background layer(s). Because you had layer 2 in the foreground and layer 1 in the background, the order should now be reversed. If you don't have them set that way, press the 1 key and then ALT 2 to achieve the same result. That result, of course, tells Modeler that the box, which is foreground, will be carved by the sanders in the background.

Press Shift B to bring up the Boolean requester. We want to remove the shape of the sanders from the shape of the box, so click Subtract. After a brief pause you will find that your foreground box now has rounded edges on the sides. Go to the Display Menu, click Options, then click Moving (under Preview) and then Solid, which will appear after your previous click. Click OK, and you'll see a solid rendition of the shape in the normally blank corner of the screen.

Run off into LightWave by clicking the Layout button in the upper-right corner of the Modeler screen. From the Scene Control Panel, click Clear Scene to get rid of any settings that may already exist. Return to Modeler by clicking its button. From the Objects Menu, click and hold the Export button. The word <<new>> should appear as the only item in the pop-up list.

Let your pointer highlight it and release the mouse button. LightWave presents you with a file requester so that you can tell it what to call the object and where to put it on the drive. Name the object SlotMachineRev1.lwob and hit Return or click OK. Now, the object is sitting in LightWave waiting to be examined. A rendering of our current object can be seen in Figure 5.

That's it for this installment. In this tutorial, you have learned how to make Booleans work for carving, a technique that we're going to use heavily in the next installment. In the meantime, why don't you experiment with it to master your new skill. Just make sure not to save over any of the objects we've created. We'll be using them soon so will want to make sure nothing is different.

VTU

David Hopkins is Graphics Director for Gun for Hire Film and Tape—a broadcast post-production house in Santa Monica, Calif. He is also the founder of Mach Universe. His five-Toaster system renders around the clock for clients such as Pepsi, Nestle, EMI Records Group and Caesars World.

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CYBERSPACE

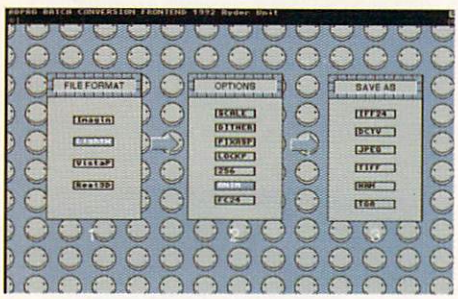
Batch Processing and ARexx

Helpful Public Domain and Shareware Software

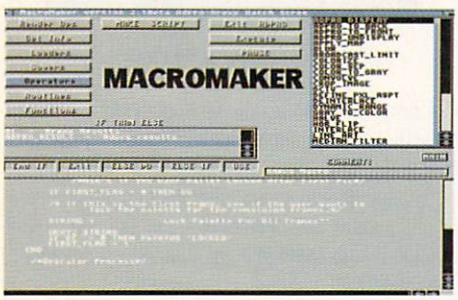
By Geoffrey Williams

Once the Toaster has grabbed an image, it may require a bit of tweaking. While you can do some image processing directly with the Toaster, you still really need a full-blown image processor. The top three are ASDG's Art Department Professional, GVP's ImageFX, and Black Belt's Image Master. Each has its own strengths, and I've used all of them.

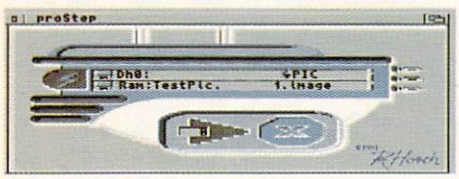
They all share one problem, though. Many of the most powerful features, such as sophisticated batch processing, are only available to those willing to write custom ARexx scripts. This goes beyond what most users are willing to do. Fortunately, there is a lot of help in the freely distributable domain, from batch processors to already written ARexx scripts. This month, we'll look at some of the most useful.



ABC does basic batch conversion and Anim compiling.



Macromaker makes it easy to create ADPro macros.



ProStep lets you select images for batch processing.

Art Department Professional

Since ADPro has been out the longest, it has the most utilities and Arexx scripts available. You can use FRED (an automated method to process multiple frames or images) for batch processing, but most users are not all that happy with it. There are several utilities available to help make the task a little easier.

Batch Pro, by Matt Shaw, provides a simple way to batch process image files from one format into another. It makes it quite easy to convert an entire drawer or just part of it into JPEG or any other format.

ProStep is a bound CanDo application (it requires Deckbrowser to run) that lets you set up ADPro and select a series of images for batch processing. It runs on Workbench and has a neat high-tech look.

Richard L'Hommedieu wrote Macromaker to simplify the process of creating ADPro macros. Frankly, a program like this should have been a part of ADPro in the first place. Earlier versions of Macromaker were crippled demo versions, but version 2.2 is a fully functional shareware program.

Macromaker eliminates most of the typing (and the possibility of typos) when creating ARexx scripts. When you click on one of the operation buttons, the appropriate lines of ARexx code are added to the lower script window. You can also directly edit the script in the script window, and there are cut, copy, paste, indent, and delete line options. You do have to understand some of the basics of how ARexx works with ADPro, but not in as much finicky detail as when writing ARexx scripts by hand.

In addition to the regular ADPro operators, loaders, and savers, there are several special functions. There are preset routines to load and save files, both individually and in batches. You can do batch process compositing with an image on top or underneath a series of images with control over mix and transparency color. You can easily make error requesters or a requester to give the user a choice between two different options. You can create your own useful ARexx routines and save them as function calls to be used in other scripts. You can also run DOS programs. There is also a function to run MakeAnim (a PD anim compiler) and create an animation from a batch processed series of images. MacroMaker also has complete support of if/else/then conditional branching

When you go to save your script, a new window pops up to let you save it to any function key combination you want. This makes it immediately usable in ADPro, so you can make your Macro jump into ADPro and run it from a function key. Overall, this is a very useful program, and also is helpful in learning how to write ARexx scripts so you can always see the code you are creating and get a better idea of how the different ARexx commands should be structured.

ARexx Scripts

There are a growing number of ARexx scripts available. They are enormously useful, and I hope to see even more of them. I encourage those of you who are writing ARexx scripts for your own needs to share them with others. Upload them to your local BBS, or send them to me and I'll help get them circulated. Here are some that I've found on the boards.

ABC (Art Department Batch Converter) was written by Ro Sato to do basic batch conversion and Anim compiling. It can wait for frames to come in from LightWave and other 3D programs, and convert them into a DCTV Anim or JPEG them. It can also scale the images, add dithering and adjust the pixel aspect ratio. It uses W.G.J. Langeveld's RexxArp.Library to provide an attractive user interface. It uses an IFF image for the background and buttons, and as long as you keep the windows in the same place, you can customize it.

Paul McClung wrote Twirl to automate the new ADPro/Morph Plus Twirl operator. It brings up a requester to ask what image you would like to twirl, and ADPro then loads the file and saves it based on the current settings. Another requester comes up to let you specify the Anim name and destination directory. Requesters then prompt you for the number of frames, degrees of rotation, the x and y coordinates, and the size of the twirl.

Edging (author unknown) will produce a high-contrast, line-art picture using an included laplacian filter that produces a white edge around everything in the image.

Cyberspace Continued on Page 54

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VT_FRAME by Todd Olson is a pseudo-saver for ADPro 2.3 or MorphPlus 1.2. It passes image data from ADPro/MorphPlus to the ToasterPaint framebuffer and scales the image and adjusts the aspect ratio.

Jan Van Overbeke's ScripIt consists of a collection of ARexx scripts designed to be used with the commercial Opus directory utility. They can also be assigned in the normal ADPro way, although they will not have batch processing capabilities, and can be added to other scripts.

There are scripts to do many basic things, such as load and close ADPro, emboss, composite, format convert and save, negative, scale, color correct, dither, gray scale and color conversion, and lock and unlock the palette. There are also a few unusual capabilities, such as changing the names of a series of numbered animation stills, and a script that lets you mix from one image to another over a series of frames.

For the most part, though, these are basic functions that you use all the time, so it is helpful to have these scripts already written and available; there are a total of 23 scripts.

ImageFX

Thomas Krehbiel, the creator of ImageFX, has written a large number of ARexx macros for use with his program (there are 30 in version 1.5). You may not realize all the possibilities of using ARexx with ImageFX until you start poking around. If you have the latest release, you have the newer scripts. If not, some of them have been released and circulated on the boards. Because so many scripts have been written by Krehbiel, there are only a few third-party scripts available. I'm sure more will appear as people try to figure out what Tom hasn't included.

Matthew Brauer's RenderMorph loads the images that you select and proceeds to convert them to an animation, with adjustable scaling. It is a little different than Image F/X's IMP animation compiler.

Todd Olson's ToTP lets you send the current image directly into the Toaster framebuffer of your choice. It brings up a sliding gadget that lets you select the frame buffer, and automatically scales the image to Toaster resolution.

Doug Richardson's ProofSheet produces a superbitmap (2,400 x 1,600) proofsheet of 3 x 3 images. It lets you choose a scalable font and size for the filename underneath each image, and then saves the image in JPEG format. You can print out the superbitmap to keep for reference, and scale the image down for storage and general on-screen reference.

The newest version of ImageFX is able to load multiple palettes. Jason Andreas has put together a collection of 42 palettes called IFXPallete for use with ImageFX, and they are quite good for making interesting graduated fills.

Image Master

I had a whole bunch of ARexx macros for BlackBelt's Image Master, but I'll be darned if I can find them. The one I did find is pretty neat, though. Written by James Hasings-Trew, TimeMachine takes a series of animation frames and applies one of three special effects to them. It creates new frames "in between" pairs of old ones through cross-fading to create the new frames. Time-dilation does a similar effect except that it uses two or more previous frames to create the illusion of speed exceeding the camera's shutter speed. Trails creates a persistence of vision effect by combining the previous five frames in diminishing strength.

Note to programmers: I really need an automated way to catalog my 24-bit images. It seems to me a very slick cataloger could be created, using one of the image processors to do the image loading and scaling (Proofsheet is a start). It should allow for adding key words for key word searches and be able to index by type and category. You should be

able to double-click on the image you want and have it automatically loaded into a Toaster buffer or the program of your choice. I have huge amounts of 24-bit imagery, textures, and clip art, and I'm sure others are in the same boat. It can't be that hard to develop (maybe even under CanDo), and would make a great shareware item. If anyone is tackling this, please let me know.

Bulletin Boards

In our continuing quest for the best Toaster and LightWave BBSs, here are some additional boards you might give a call. If you know of a good Toaster-related BBS, or if you are the system operator of one, give me a call at (818) 240-9845 or drop me a line, and we'll let other *VTU* readers know about it.

The 3D Art Forum in Entibocoke, Ontario, Canada (416-236-9828) is a BBS dedicated to 3D artists. It's a 24-hour board system operated by Gord Davis, running at up to 14.4 bps with over 300 MB of online files. The board is affiliated with the 3D Art Forum International, founded in Los Angeles by Victor Osaka. They have over 225 file areas with dedicated LightWave 3.0 areas for objects, images (of various formats), animations and tutorials, plus file areas for other popular Amiga 3D programs including Imagine and Real3D. Everything is broken down by category so it's pretty easy to find what you want from the huge number of objects, textures and other files. Their message bases are very active, and they are currently organizing a 3D/Toaster/LightWave FidoNet echo between their board and many other 3D BBSs across Canada and the United States.

Also in Canada is the Electronic Image BBS (514-937-9984 and 514-937-2137). Their emphasis is focused heavily on graphics, animation and related themes (sound/video/multimedia) for all computer platforms. The validation process is quite stringent: You have to be either actively working in a related field or a serious hobbyist. Consequently, there is a large percentage of video, animation, and graphics professionals on the board. The sysop, Sean Mollitt, tells me that he makes his living working in graphics and animation and has been teaching 3D animation and computer graphics for over two years at Dawson College in Montreal. The BBS carries a large number of international FIDO conferences and has an extensive public domain and shareware file library with over 17,000 files. The majority of the file bases are graphics and animation oriented.

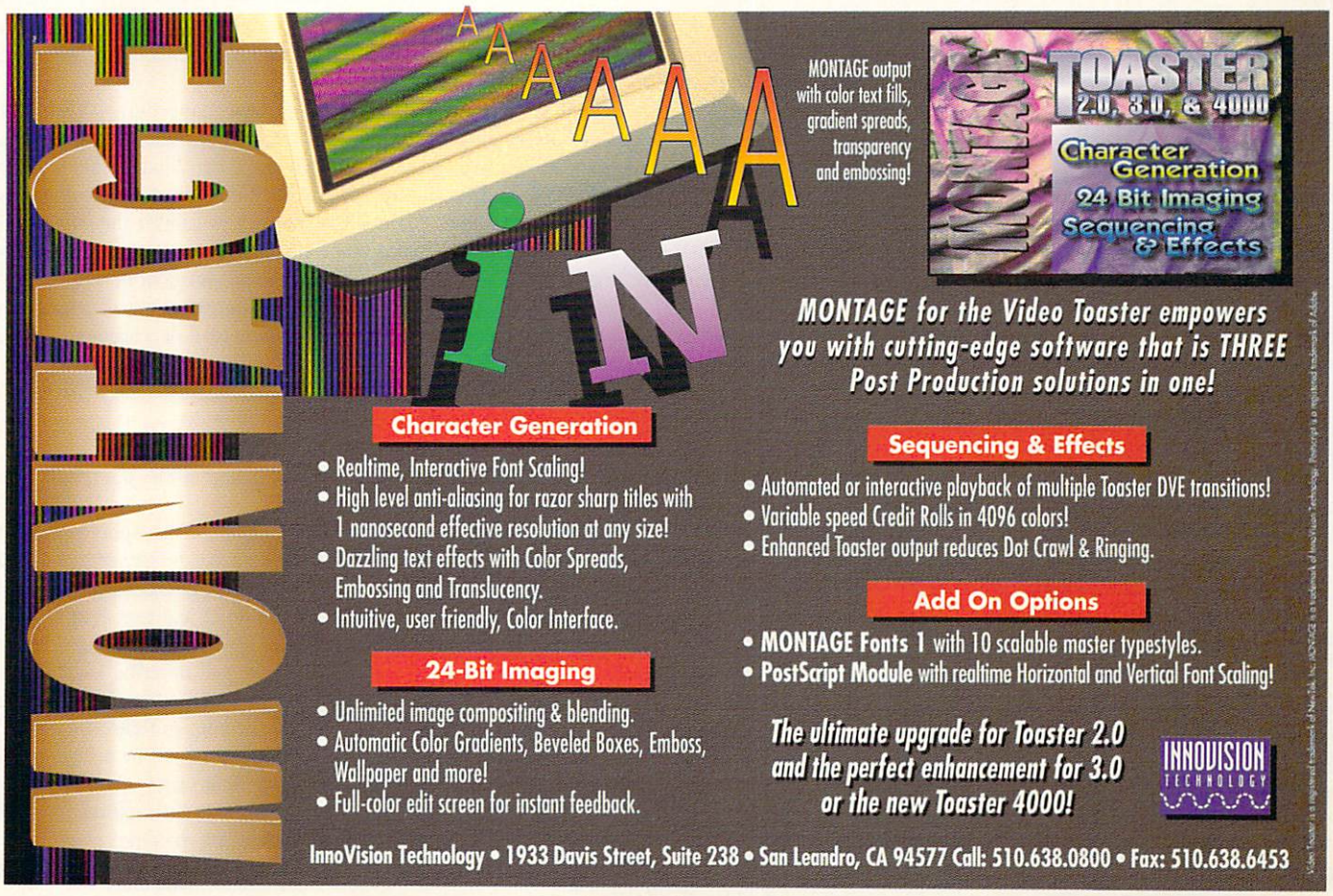
Club Toaster (813-527-1722) is a fairly new and growing board dedicated to Toaster users. The system operator tells me that they are open to user suggestions and that they carry all of the Amiga-, computer video-, and Video Toaster-related USENET message bases as well as a growing collection of PD utilities, images, textures and objects.

Toaster Pro (215-356-7442) is another well-organized BBS just for Toaster users with over 400 files. There is a good selection of Adobe Type 1 fonts, backgrounds and Toaster wipes, as well as many objects.

Toaster Universe BBS (305-821-0455 Supra 14.4 and 305-821-0249 HST 14.4) is a membership-only fee-based BBS located in Miami. System operated by video and Toaster professionals Joel Tessler and Jim Mixon, it features PD LightWave 3D objects, Toaster-specific PD utilities, a "Toaster Gallery," and several online message bases dedicated solely to the topics of the Toaster, video and related topics. It shares the same system as the Media Zone BBS.

VTU

You can find most of the utilities covered this month by contacting the various BBs mentioned here and in the last issue. As usual, though, I've put them all on a disk, which you can get by sending $5.00 to Geoffrey Williams, VTU *IP Utilities Disk Offer, 1833 Verdugo Vista Drive, Glendale, CA 91208.*



Circle Reader Service No. 129

ABC of Video, Part V

match frame editing

By Rick Lehtinen

[Editor's note: In this series, the author has covered how video signals are created, how video devices fit together and the role of the sync signal and its control in some detail. You may wish to refer to the preceding ABCs of Video to refresh your memory.]

This is it. You have made it through the first four installments in this series and are finally ready to get to the biggie—timing a Toaster for match frame editing. In this article, we will begin to combine all of the technology we've explored in the first four parts.

So, why do we want a timed Toaster? All of the video sources need to arrive at the inputs to the Video Toaster precisely in step if the Toaster is to be able to perform its tricks. When it is cooking, the Toaster will reach out and grab video from several sources, including its internal still stores. Proper system timing is needed to allow all this video to slide together. If anything is out of time, it gums up the works. In the case of match frame editing, improper timing will cause you to end up with a tape full of little jump cuts that will make your good work look crummy.

First, the System

We will start by describing a fairly generic system, and I'll keep it minimal. For our purposes, we will use a Toaster, an edit controller, three tape machines (two source decks and one edit recorder), a camera on a copy stand and an extra video source, which we will leave undefined for the moment. See Figure 1.

To operate our tape machines, we will need an edit controller. Its purpose is to orchestrate the movements of the tape machines. This is drawn into the figure as a standalone box, although it could just as well have been one of the newer systems that mount inside of the Amiga or some other personal computer.

We will also show standalone time base correctors (TBCs). As explained in previous installments, the TBCs compensate for errors in the video signal. Many of these errors are momentary inaccuracies in the speed of the head drum and reel servos. Such inaccuracies cause the video signal to stretch in time. The time base correctors stabilize the signal. They are shown here as freestanding units, although they may as well have been included in the VTRs or mounted on cards in the Amiga or in a PC.

The camera on the copy stand provides a convenient way of getting hard copy images, such as the logo from a business card or a signature from a letter, into the system.

Notice that we have not defined a video input device for Toaster input No. 1. This is because choosing the source for video input one is one of the first steps in getting a Toaster system properly timed.

Rule One: On the Toaster, video input No. 1 is always the reference to which the system locks.

In the drawing, we show a distribution amplifier that splits and shares the main genlock signal, which we call the *system reference video*, with the genlock inputs of all devices in the system, including Toaster input No. 1. The Toaster listens to the signal on input No. 1 and uses it as a timing reference for all of its internal operations. (If you are not using a Toaster 4000 board, it is desirable, for a reason we will describe later, for the video source on input No. 1 to have separate horizontal (H) phase and subcarrier controls. This is shown by the shaded box in Figure 1.)

For best results, Toaster input No. 1 should be fed by a high-quality video source. One popular trick is to connect the copy stand camera to input one. (See Figure 2A.) The camera is likely to be a reasonably stable source of reference video and is likely to have the required phasing controls. The drawback to using a camera as a video reference is that it pretty

well ties up the camera. You need the video reference to use the Toaster, and if your camera is hooked to Toaster input one, it isn't out shooting something. Many users don't have cameras to spare. For this reason, several alternatives are popular.

Reference Video Department

If your Toaster is located in a larger production facility, there will likely be a reference signal available called *black burst* (actually black with burst). This signal is used as a *house sync*, that is, a video reference used by all of the equipment in the facility. Plugging it into Toaster input one is the first step towards getting your Toaster system in time with the rest of the facility. See Figure 2B. You will still need copies of this signal to genlock all of the devices connected to the Toaster's inputs. This will require a distribution amplifier.

If you are using a Toaster 2000 series board (that is, the older Toaster board that came with software versions 1.0 and 2.0), you will also require the provision for modifying the timing of the signal to input one. In this configuration, this is accomplished through a special DA, called a delay distribution amplifier.

If your Toaster is a freestanding system, you will need to provide your own video reference source. A common technique is to use the *color black* output of a sync generator or a test signal generator. See Figure 2C. This assures that your reference video is of high quality, helping the Toaster to produce better video.

I know that the first priority for extra dollars in most facilities is not something as esoteric as a test signal generator. However, be advised that used equipment is often available at a nominal cost. Even if you purchase the sync generator or test signal generator new, it is likely to cost less than a camcorder. In addition to providing a fine reference video source, a test generator can help you perform some of the alignments you will need to make to keep your Toaster making match frames.

Sync or Swim

If you have set things up as outlined so far, you will have a reference video feeding Toaster input No. 1, and three video sources on inputs two through four. Question: How are you supposed to adjust the other three video sources so that they match the first one? Be careful, there is a trick to it.

Rule 2: Unlike many video switchers, the Video Toaster puts its own sync, not the input sync, on its output. This means the Toaster cannot be timed merely by comparing each input through the switcher.

Most other switchers pass the video through the system without reinserting sync. These switchers depend on the manufacturers of all other video equipment to be responsible enough

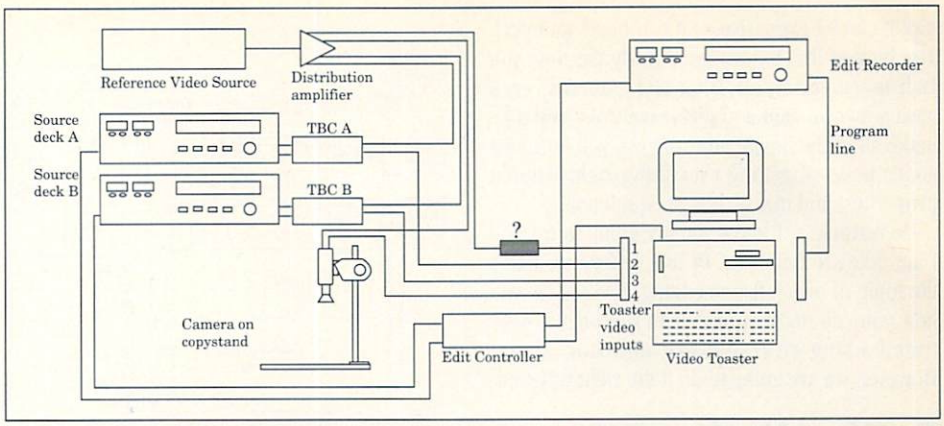


Figure 1– In a match-frame editing Toaster system, the video source for input No. 1 demands special attention.

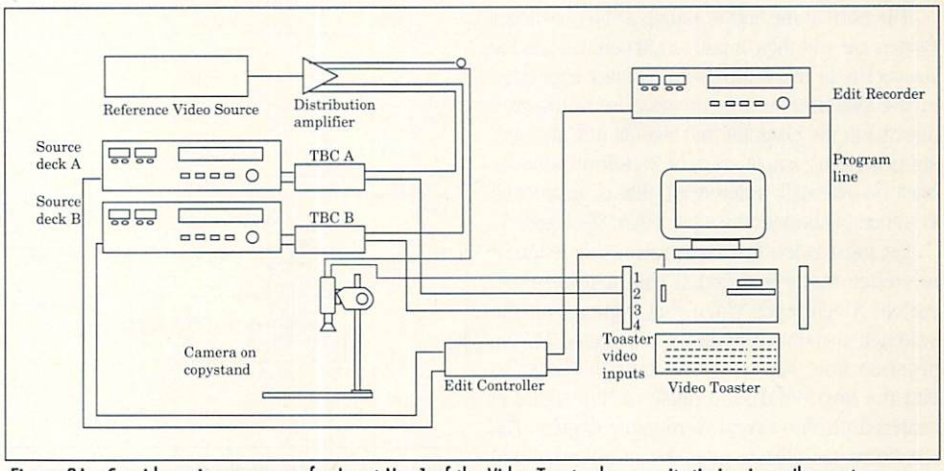


Figure 2A– Consider using a camera for Input No. 1 of the Video Toaster because its timing is easily reset.

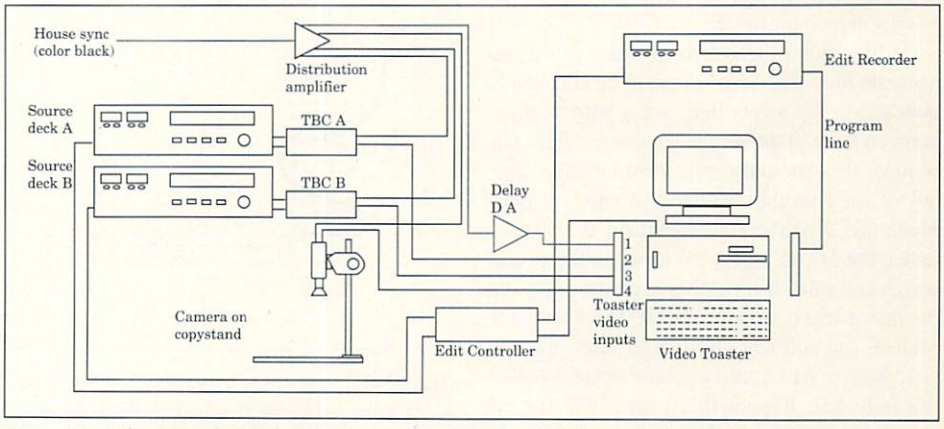


Figure 2B– In larger production facilities, house sync will be distributed to each device in your system.

to provide standard video output, including standard sync. Unfortunately, for many low-priced camcorders and VCRs, such just isn't the case. The Video Toaster avoids a lot of problems for its users by stripping the sync pulses off incoming video and replacing them with sync that is internally generated.

This is great because it improves the technical quality of your video output. However, it means that you must use a slightly unusual method of checking the input timing of each source.

To appreciate the Toaster-style of doing things, we will first explore the conventional way. Besides helping you understand Toaster's uniqueness, this material will help you later on, when we discuss how to integrate a Video Toaster into an existing facility.

However, first it is time that you face a video fact of life:

Rule 3: There is no real substitute for a properly calibrated video waveform monitor and vectorscope. You need them. Period.

There, I've said it. Trying to align a video system without the right equipment is as difficult as trying to discuss world religion without making reference to deity. In video engineering, test equipment is a source of truth and enlightenment. The test equipment can be new, it can be

old, it can be expensive or it can be economical. The bottom line is, you need it. By the time you lash together several TBCs and cameras, each having its own gain and phase controls, and then make all of the timing adjustments, you haven't a gnat's hope of getting everything right without proper test and measurement equipment.

Nevertheless, I know you are going to try, and I am going to help you. In fact, before we finish the topic of match frame editing, I will show you how you can make your system reasonably well-timed using your picture monitor alone. However, we are going to do it the right way first.

Setting Horizontal Timing

The normal method of timing a video switcher (which we will then modify to accommodate the Toaster) is to use a waveform monitor connected to the switcher output. It must be connected directly on the program line without any intervening processing amplifiers. The waveform monitor must be externally referenced, that is, genlocked to something besides the input video. See Figure 3.

On most video test equipment, this external reference mode is selected with a front-panel switch. A reference video that appears on the switcher, usually color bars, is selected on the program line. The waveform monitor is set so that the horizontal sync pulse of this signal is centered on the waveform monitor display. The waveform monitor is often set in an expanded mode and shifted left, so that the H pulse plus just the leading edge of video fills the entire waveform monitor display.

At this point, the reference video is on the program line. The video source to be checked is now set on the preset line, and a wipe is done between them. If the source you are testing is out of time, the sync pulse will seem to shift either left or right on the waveform monitor display. Move the H phase adjustment on the source under test as you repeat the wipe, until the sync pulses and video from both sources stay in place on the waveform monitor display. When timing is perfect, you will feel the urge to look down at your wrist to make sure you have actually pulled the fade bar. Repeat this procedure for all sources on the program bus.

To test tape machines, play back a clean recording of the same bar signal. To test a camera, switch on camera bars and hope they are a reasonable match to the bars coming from your test generator. Experience will teach you how to compensate if they are not. Test other video sources that do not have an internal color bar generator in a similar manner. In cases where the video does not match precisely, align on the sync pulses. (This is one of the reasons you need test equipment, so you can see the sync.). If neither the sync nor the videos match, try to align the middles (50 percent points) of the rising and falling parts of the sync pulses. If you can't get even that to match up or if when the sync is aligned the video is grossly off base, you may be trying to align a broken piece of equipment. Have a competent engineer check it out.

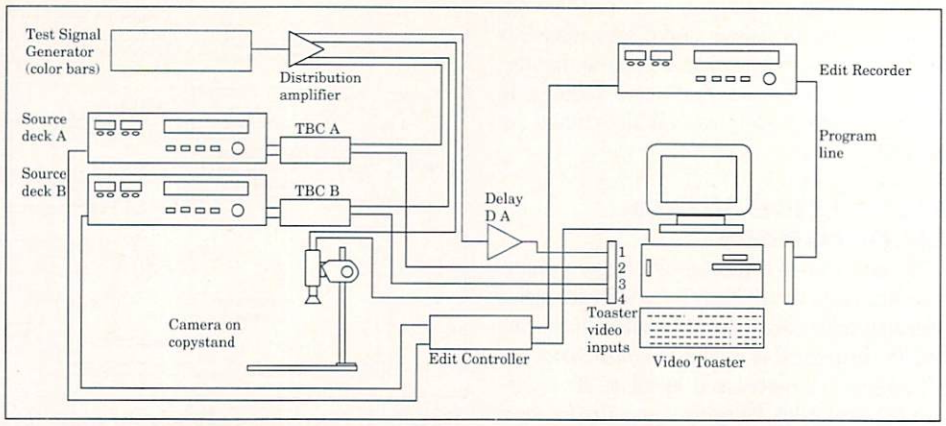


Figure 2C– A standalone Video Toaster requires stable reference video, preferably from a test-signal generator.

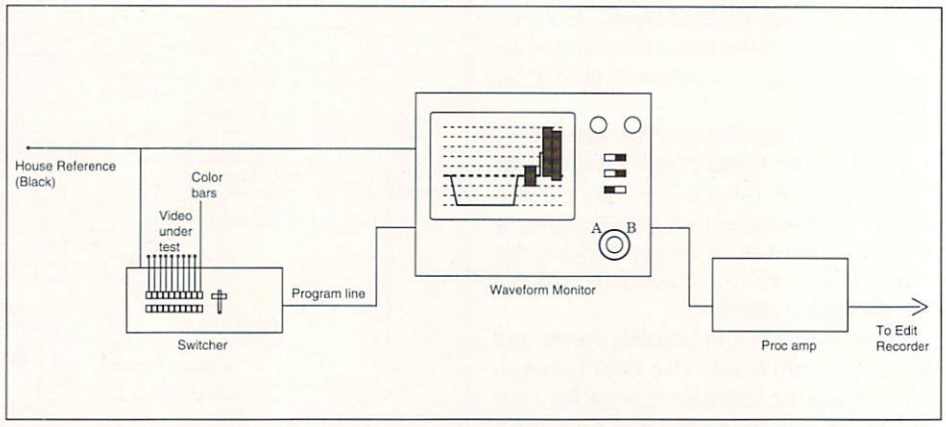


Figure 3– To time a conventional switcher, the waveform monitor must be externally referenced.

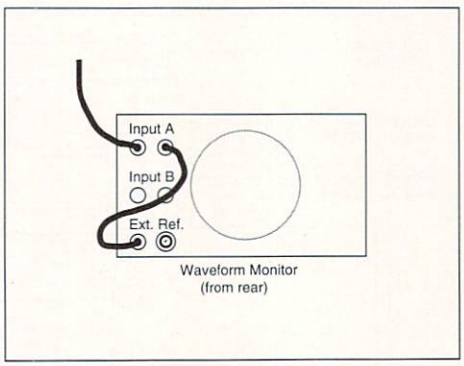


Figure 4– It can be easier to compare A and B, if the A side is "looped through" to become the external reference.

Again, when doing timing measurements, the waveform monitor must be externally referenced, that is genlocked, to something besides the signals it is testing. A feed directly from your test signal generator will do. If the waveform monitor is set for internal reference, it will genlock to whatever signal is on its input. This is fine for reading video levels, but it will not show timing errors. This leads to a *gotcha*. Some, but not all, manufacturers of low-cost waveform monitors, including some of the PC-card-mounted varieties, have neglected to include external reference capabilities. Shop carefully!

As we mentioned, the Toaster replaces all the sync from all the sources feeding it. This hides the timing errors, making it very difficult to time inputs correctly by looking at the Toaster's output. Instead, we need to measure each of the video sources directly, comparing them with and aligning them to the reference video on input one.

By now, you can pretty much guess that this will require the use of an externally referenced waveform monitor. Most waveform monitors have two or more inputs, commonly called the A and B sides. Connect the video feeding Toaster Input One to the A side of the waveform monitor. Connect the other input sources, in their turn, to the B side. The exact procedure you use will depend on the quality of the instrument.

The most expensive waveform monitors will be *dual trace*. This means that both the A and B inputs can be viewed at the same time. This makes alignment easy. Simply adjust the H phase of the source on the B side until its waveform sits directly above the reference waveform on input A.

Less expensive waveform monitors will not offer dual trace over the full line, but will be dual trace while in the expanded modes. This will meet your needs for this adjustment.

Still lower-priced waveform monitors will not dual trace at all. However, they might offer a chop mode that will rapidly switch between the

inputs. As long as you externally reference the waveform monitor, this should work.

Some waveform monitors are neither dual trace nor chop. In this case, position the reference video on the A input at a convenient location. (See Figure 4 for a wiring tip that will make this a lot easier.) Now go to the B side and adjust the H phase of the equipment under test so that it sits over the spot where the A side used to be. Go back and forth, using the graticule markers as a guide. You may even find it useful to mark the waveform monitor display with a grease pencil, to help guide you in. One technician I have spoken with adjusts his Toaster setup by turning the intensity of the waveform monitor trace full on. When he then switches to the B side, he can just about have the adjustment complete before the trace left by the A side finally fades away. This may work for him, but I bet it is hard on the waveform monitor.

As a last resort, you can feed both the reference video for input one and from the source under test into a coaxial T fitting and plug them both into either input of the waveform monitor. This method is error prone because some adding can occur between the signals. You might have to interpret a non-standard wave shape.

As a final alternative, you can perform this alignment using a good-quality, dual-trace oscilloscope. The plus is that oscilloscopes are far more common than waveform monitors, and it is likely you can more readily borrow one. Any television or VCR repair shop and a lot of colleges and trade schools should have one. One minus is that these adjustments need to be repeated periodically. (Many post-production houses time their switchers each morning.). You really should have the right equipment on hand.

Another minus is that to make this adjustment you must have a good scope technique. The waveform monitor is optimized to show fine details in the video signal that a scope might miss.

To make these measurements, use the actual cables that feed the Toaster if at all possible. If they won't reach, you can use jumper cables, but make sure they are of exactly the same type of coax and that they are within an inch of each other in length.

The astute reader will realize that there is more to system timing than H phase adjustments. This is true, but I did not want to introduce you to both waveform monitors and vectorscopes in the same article.

What about that workaround I promised, where you use your program monitor to do most of these adjustments? Stay tuned. We'll cover that next time.

VTU

What Is a Match Frame Edit?

One of the more difficult tests of an editing system is its ability to repeatedly perform good quality match frame edits. This begs the question: What is a match frame edit? A little review of editing terminology will not only provide some useful background but will help answer the question as well.

Accompanying any taped video signal is a series of regulating pulses called *control track.* Control track is roughly analogous to the sprocket holes on the edge of a piece of film. The control track typically occupies a band near the edge of the videotape. Its purpose is to mark the location of frames on the tape and to provide drive information to the servos and counters that keep the tape running smoothly.

Separate from the control track, and in addition to it, is *time code.* The time code is analogous to the edge code numbers on a piece of film. Its purpose is to identify each frame of video by giving it an address. It is possible to operate a VTR without time code, but not without control track.

The process of laying down control track is called *blacking* a tape. This is because it is usually done by recording a black signal. (It is black to avoid bleed through in subsequent recordings.) To lay down a time code track is to *stripe* the tape. A tape must have control track before it can be striped, although both operations an occur at once.

The very act of recording will lay down a control track and can be considered a form of blacking. In fact, to butt new segments onto the end of previous recordings on a tape will eventually fill the tape with a continuous, uninterrupted control track. This process is called *assemble editing.*

As mentioned, the control track marks where the video frames lay on tape. The control track pulses tell the VTR's internal controls when to speed up or slow down to capture the next frame of incoming video. It is important that the control track be accurately recorded and unbroken. Otherwise the VTR will loose track of the video and may hunt for a moment. This will show up as *video breakup.* (You can simulate this effect by suddenly bumping and returning the tracking knob on a home VCR.)

There will be times when it will be desirable to re-record certain segments on a tape. This might be needed to fix a mistake or to replace an older segment with updated material. However, if one goes blasting into the middle of a previously recorded tape, one will likely disturb or destroy the control track. As we just discovered, this will lead to video break up.

The answer is to insert only the new video material, while leaving the existing control track in place. When the edit record machine is in *Insert* mode, the new video will be recorded without its control track affecting that of the master.This process is called, appropriately enough, *insert editing.*

If we were to build our edited tape using whole chunks of video, with clean breaks between each piece, it would be called *cuts-only editing.* Most of the machine-to-machine work done in news edit bays at television station is cuts only.

Should we desire to make a wipe or transition between pieces of video, we need to have some way to deal with two video sources at once. This is called *A/B-roll* editing. The instant we move from cuts-only to A/B-roll, we need time base correctors. This is because both the video sources must be held in lock step with each other for the transition device, or switcher, to shift between them cleanly.

An advanced form of A/B-roll editing is *match frame editing.* This is tricky, because in addition to keeping the two video sources straight, the edit controller must be able to frame accurately control the tape machines. Match frame edits are used when performing a series of wipes or dissolves between several short pieces of video. The tape on the A machine first rolls, and the switcher performs a transition to the video on the B machine.

In a perfect world, the A machine could fly ahead and get cued up to its next segment before the segment on the B machine played out. If this were the case, the transition could proceed without interruption back to the A machine, and there would be no reason for a match frame edit. Chances are, the A machine won't make it. In that case, the B machine has to stop until the A machine is ready to go. The A and B machines must then both be re-cued, and the next transition executed as a separate edit.

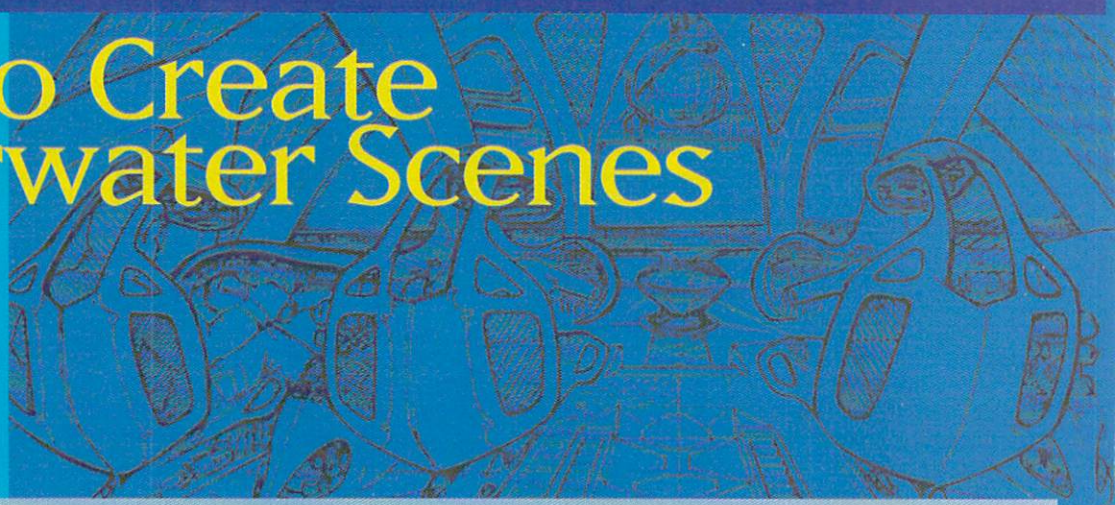
Here's the rub. Making it all work requires a tremendous amount of hardware to all play together perfectly. First, the transition must end up as designed. This requires the A machine to be where it is supposed to be when the time comes for it to be there. The B machine has to start providing material for the new edit from right where it was, plus one frame. The record machine also has to start laying down the new edit precisely on the heels of the previous one.

VTU

seaQuest secrets

How to Create Underwater Scenes

By Angela LoSasso
with John Gross



Hollywood is famous for many things. Almost daily, the studios receive notoriety in the press for their methods of typecasting. When a studio wants a male sex symbol they go after Tom Cruise, Mel Gibson or Harrison Ford—not Woody Allen. When actresses are sought, Whoopi Goldberg and Rosie O'Donnell are not considered for the same leading roles as Julia Roberts or Sharon Stone.

That's Just the Way It Is

Not all typecasts or stereotypes for that matter are as limiting. Some can enhance careers or even go as far as creating awe within the entertainment industry. When studios are promoting a suspenseful mystery, you can be sure they'll want an association like "classic thriller in the spirit of Alfred Hitchcock." Director James Cameron is renown for blockbuster action (*Aliens, The Terminator* and *The Abyss*). When Steven Spielberg's name is attached to a project, you can pretty much take three things to the bank: quality, effects and financial success (especially the latter with the two highest box-office grossing films of all time: *E.T.* and *Jurassic Park*).

It is no great wonder then that the NBC television series *seaQuest, DSV*, co-produced by Spielberg's Amblin Television and Universal Television, has generated so much interest. More than 23 million people watched the premiere last September, largely due to NBC's effective promotional efforts that created tremendous viewer anticipation by mentioning Spielberg's name loudly and often.

According to the show's publicity department, reviews have been mixed. At press time, *seaQuest* was ranked 45th out of 102 prime time shows, including movies of the week, according to Daily Variety. However the show is holding its own on Sunday night. "In the 18 to 49-year-old demographic, *seaQuest* has won its time slot every week," said Curt King of NBC media relations.

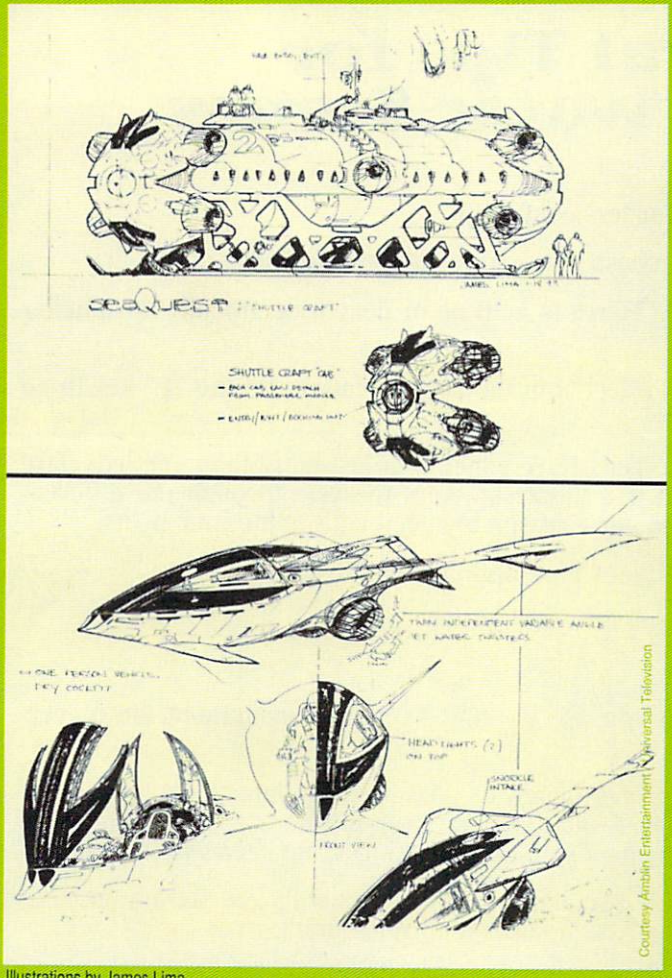
Since its premiere, *seaQuest* has also received tremendous attention for its underwater effects. And, more often than not, the media and public have responded favorably to the art direction and LightWave-generated scenes.

With the majority of Hollywood's best LightWave animators on staff, a 40-Toaster rendering farm, a NewTek Screamer, Amiga Bernoulli Boxes and other integrated equipment, Amblin Imaging feels confident that its animations are improving on a weekly basis. And because of the quality demands and deadline pressures a prime-time series brings, the Amblin Imaging staff has one-of-a-kind experience exploring LightWave. In fact, some new LightWave 3.0/4000 effects, tools and tricks are available only because the animation needs of seaQuest demanded that NewTek and LightWave programmer Allen Hastings create them.

After our first look at *seaQuest* (in the August/September 1993 issue of *Video Toaster User*) and since the premiere episode aired, a large number of readers have requested that we find out more about the animation techniques and any secrets that the *seaQuest* animators may have. This was not any easy task, considering that Amblin is very protective of their techniques and the images themselves. Upon receiving approval from various authorities in the Amblin public relations department, *VTU* traveled to the Amblin Imaging building on the lot of Universal Studios to compile this exclusive report: How to Create Your Own Underwater Scenes.

Courtesy Amblin Entertainment / Universal Television

Courtesy Amblin Entertainment / Universal Television



Courtesy Amblin Entertainment / Universal Television

Illustrations by James Lima

First, Your Object

The original seaQuest sub sketches were created by Amblin Imaging's director of Computer Graphics Imaging, James Lima, and are pictured to the left. The seaQuest design concept was interpreted by the animation staff and created in Modeler before being rendered in LightWave.

The first step in designing an underwater scene is to create your own object in Modeler. The Amblin staff recommends that you keep the object under 30,000 polygons for reasonable rendering times.

Setting up an Underwater Scene

There are three keys to setting up a realistic underwater scene: Background Colors, Fog and Lens Flares/Glows.

Background Colors

Set up a background color with a gradient or solid. Surface shots should be a light gradient; deep water shots should be a solid background.

Under the effects panel, choose a solid backdrop color of 5,10,15 RGB (a dark blue) for deep water effects. Of course, these settings can vary greatly according to the effect you want. For scenes closer to the surface, choose a Zenith setting of 0,125,155; for Sky and Ground: 0,55,65; for Nadir: 0,25,40.

The background can be adjusted according to your environment and camera angle. For example, if your camera is pointed straight down towards deep water, you may need to adjust the nadir color. Different background colors are used for shallow water or a camera angle pointing towards the surface, or for mid-depth water with the camera pointing straight ahead.

Using the Fog Option

If you've ever been underwater or watched undersea documentary footage, the limited depth of field is obvious—you can't see very far.

To achieve underwater murkiness with LightWave, use fog in every scene.

seaQuest secrets

Courtesy Amblin Entertainment / Universal Television

If you don't, there's an infinite depth of field.

A simple method to understanding the fog effect is to imagine a circle of fog with the camera at its center (fog is always measured from the camera). If you own LightWave 3.0, go to the Options panel and select Show Fog Radius. If you choose the top, front, or side view you can now actually see the fog radius. It's represented as a circle surrounding the camera. See Figure 1

The maxiumum fog radius is represented by the circle (you won't see a circle for the minimum fog radius). Any object outside the maximum distance takes on the color of the fog. In other words, when you view the animation, anything beyond the maximum distance will be obscured.

Figure 1

Figure 2

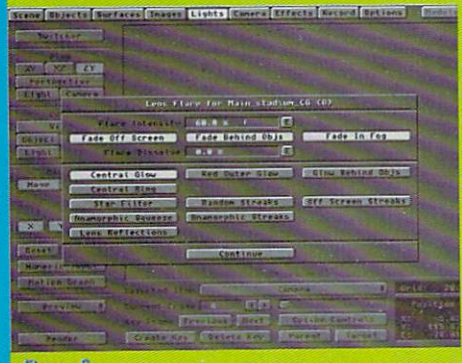


Figure 3

The minimum fog distance is where the fog starts in relation to the camera. If there is an object placed between the camera and the minimum fog distance, the object will not be obscured by fog. For example, if the object is five meters from the camera and the minimum fog distance is 10 meters, the object will not be obscured by fog. Anything in-between the minimum and maximum distances takes on some fog attributes depending on how far it is from the camera. See Figure 2.

Here's an inside tip from *seaQuest*: While most people leave the minimum fog distance at the default (0), *seaQuest* almost always uses a negative minimum so the camera is already immersed in a fog effect.

A typical setting is -50 for minimum and 200 for maximum, although it varies greatly depending on the needs of the scene. To vary the distances, envelopes are sometimes used to change the minimum and maximum fog distances over the length of the animation.

General Tips for Underwater Scenes

- Reduce ambient light.
- Rename lights for less confusion.
- Use zero light intenstiy for glows and glow behinds.
- Use Enable Lens Flares to activate or deactivate globally for quicker rendering.
- When a light is selected in the layout window, hit the "P" key to go to the Light panel.
- When inside the Lens Flare panel to adjust more than one lens flare option, you can use the arrow keys to cycle through the different lights. That's one more reason to specifically name your lights.
- Be selective with lens flare options; don't overuse.
- Make objects look dirty and grungy.
- Use a lot of fog.
- The more light you use the more computer-generated the objects and animations look.
- Try to light as professionally as possible. Use lights from "whiskers" or from the ships. Avoid the "light from nowhere"—the shining light that comes not from a ship or other object, but seems to just appear.
- A whisker in the distance is a null object with lens flare lights parented to it. Some have intensity and some don't.

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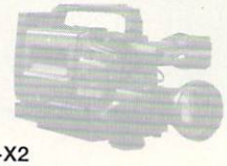

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seaQuest secrets

To create the effect of an underwater object fading off into the distance, always use Backdrop Fog. If you use a Fog Color, you may not like the results.

While using a typical solid backdrop value of 5,10,15, any object moving beyond the maximum fog radius would take on this same dark backdrop color and present the effect of fading away.

If, instead of Backdrop Fog, you use a Fog Color of say 255,255,0 (bright yellow), instead of the fading away effect, the object becomes the same color as the fog—in this case a bright yellow. This is why it's better to use backdrop fog; the object actually becomes the color of the backdrop color that you selected—whether that's a solid, gradient or an image.

Linear and Non-Linear Fog

Within LightWave you have two fog choices: non-linear and linear. Non-linear fog is more realistic because it places more fog closer to the camera, and disperses inconsistently; however, the cutoff point is always the same (the maximum setting). Linear fog progresses consistently in a linear fashion from the minimum to maximum setting.

Courtesy Amblin Entertainment / Universal Television

Lens Flares and Glows

The third component that makes a successful underwater scene is lens flares and glows. Three main options are used: flares, glows and glow behinds.

In an underwater setting, lights have different characteristics from those above water. Undersea, there's the flare of the light itself and the glow of the surrounding particulates being lit up.

To simulate an underwater light, place a light in your scene. To activate a lens flare for the light, click on the Lens Flare button, located in the Lights panel and then select Lens Flare Options. Many of the flare options are here due to *seaQuest's* needs. See Figure 3.

In a typical scene, *seaQuest* chooses Fade Off-Screen, Fade Behind Objects and Fade in Fog. Fade Behind Objects is important; if the light is parented to an object that ducks behind a mountain, how realistic would it be if the light shined through the mountain? For *seaQuest*, when lights are needed for ships or whiskers, they are always parented to their objects. Flare Intensity is typically set to somewhere between 20 and 70 percent.

Always set Central Glow on and all other options turned off in the Lens Flare options panel. Red Outer Glow is turned off because red isn't visible beyond 100 feet underwater.

Back in the main Lights panel, the Ambient Intensity's default setting is 25 percent. This is probably too high for realistic underwater lighting. Try a lower setting—0 percent is sometimes used for *seaQuest* scenes. The lower the ambient settings, the more realistic your underwater lighting will appear; a higher setting makes the light appear more washed-out.

To create an underwater glow surrounding your spotlight, here's the trick: Select Clone Light; set number of clones to One, which creates an exact copy with the same values in the same spot; then rename the clone to keep your spotlight and clone separated.

Make the clone a Point Light and turn off the Light Intensity (give it 0 intensity). This also cuts

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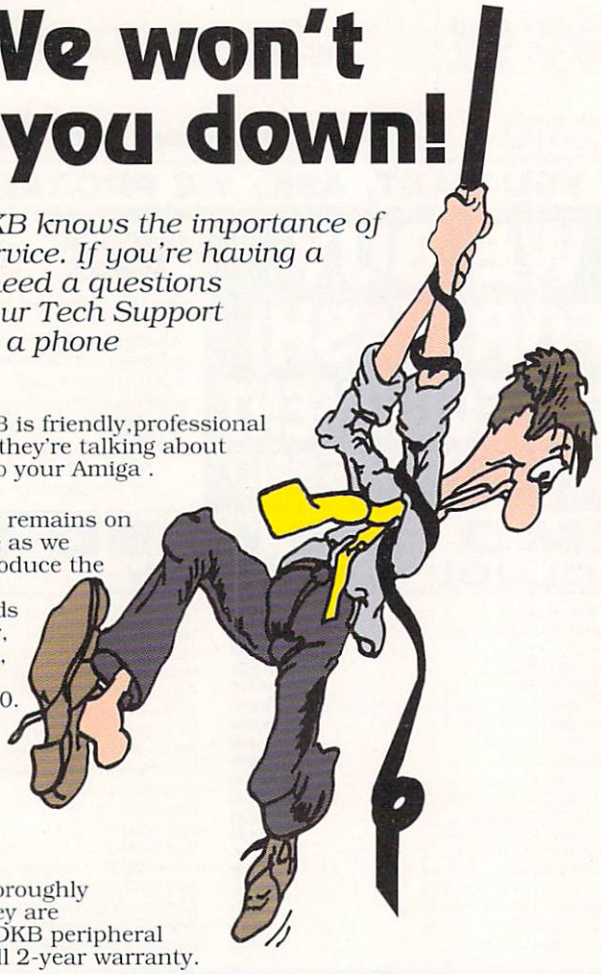

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rendering time, because LightWave does not have to calculate the light intensities.

Go to Light Color, and try the value of 0,160,255 (light blue). Go to Lens Flare options, keep the same options turned on as those of the original spotlight but increase the Flare Intensity to about 200 percent. Then give it a Flare Dissolve of around 50 percent.

Now you have one hot spot, the original light, and the huge glow—the second lens glow with the changed color and diffusion. Where in real life there is only one light and its glow, in LightWave you must create two lights for the same effect.

As with fog options, envelopes are sometimes used to vary intensity. In *seaQuest*, envelopes are often used for a sweeping light effect, like a search light.

Glow Behind

Because underwater backgrounds and ships tend to be dark, the Glow Behind option in the Lens Flare panel is useful.

Let's say you want to create a silhouette. Imagine a glow set behind your object that gives off just enough light to softly outline your object against the deep, dark sea. Make a point light with 0 percent intensity with a color of 0,160, 255—the same as used in the example above. Give it a new name. Turn on Lens Flare and then go into Lens Flare Options and turn off everything except Central Glow and Glow Behind Objects. Make sure Fade Behind is off because Glow Behind and Fade Behind defeat each other (remember our flare behind the mountain example earlier).

Typical light values for this Glow Behind Flare are a high Flare Intensity of 300 or 400 and a 75 percent Flare Dissolve. Of course these can change drastically depending on the needs of the scene.

Troubleshooting Glow Behinds

Make sure there are no objects beyond the glow behind. If you have a semi-transparent object, then beyond that a glow-behind lens flare and behind that a solid object, the transparent object will not appear transparent. This is not a program bug in LightWave; it's due to the way glow behind lens flares are calculated.

Always use a glow behind far behind an object. If the glow behind is placed in close proximity to the object, the glow can actually look as if it's cutting through the object. This is because the "plane" of the glow is always "perpendicular" to the camera view. You can avoid this by remembering that glow behinds should be used to simulate glows at a distance.

Dive in

Using these *seaQuest* tips should greatly enhance your underwater scenes. With practice and experimentation, your ability to find the proper settings for backgrounds, fog, lens flares and glows and adaptation for the environment required for a scene should improve.

If you're interested in tips and techniques for modeling and surfacing underwater objects, look for future articles and tutorials in *LightWavePRO*—the Newsletter for Serious LightWave 3D Animators, from the publishers of *Video Toaster User*.

Angela LoSasso is Managing Editor of Video Toaster User Magazine *and* LightWavePRO. *John Gross is a columnist for* Video Toaster User, *the Editor of* LightWavePRO, *and a* seaQuest *animator for Amblin Imaging.*

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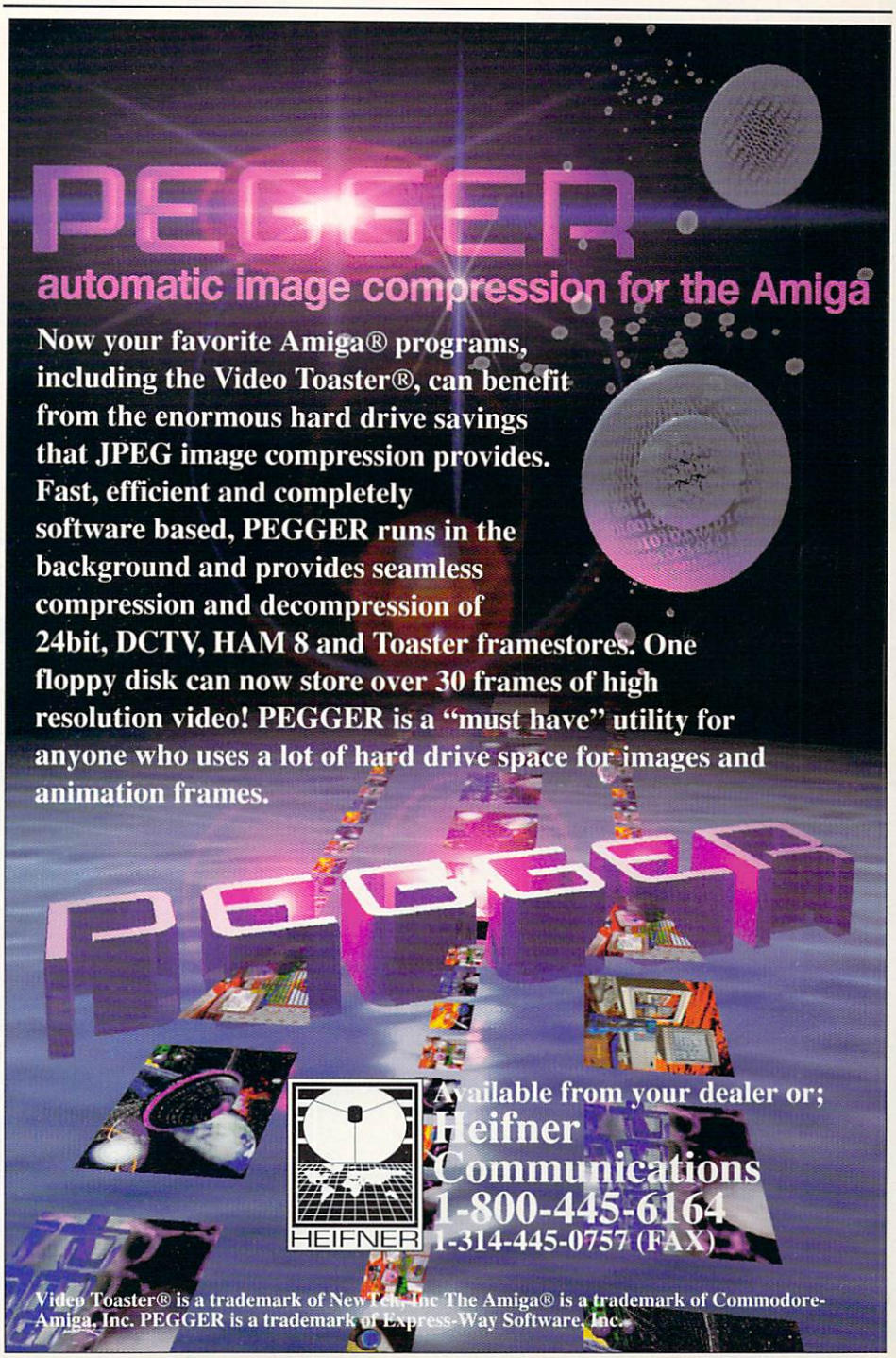

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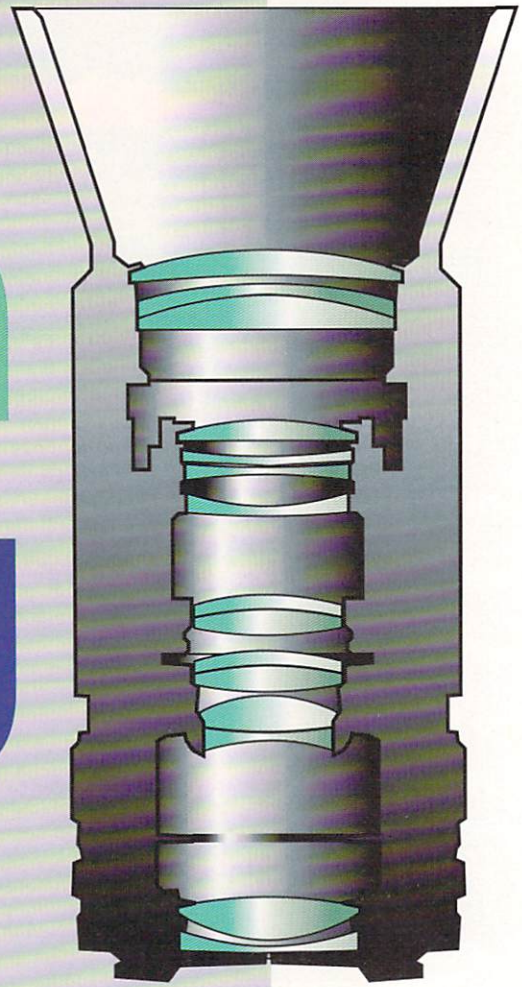


By Dick Reizner

Many years ago someone discovered that putting a pinhole in one end of a box made an image appear at the other end. Since then, we have been trying to improve the pinhole and the image. As a result, today's photographer has a huge variety of lenses from which to choose.

There are wide-angle, telephoto, zoom and fixed-angle lenses. Which should you use for a specific project and why?

Choosing the wrong lens, or using the right lens improperly can result in something like the home movies a friend of mine tortured me with last week. The movie not only featured members of his family, but also too many zooms, too much wobble and too little knowledge.

Trombone-itis

The most common problem with zoom lenses is viewer motion sickness brought on by Trombone-itis—the constant unmotivated zooms resulting from a loose nut behind the camera.

Like most other tools, the zoom can be used to help or hinder the final production. Fast zooms can add dramatic impact if used sparingly. A slow push-in as a speaker is building to a point can help communicate its importance. A slow pull-out can reveal a beautiful scene.

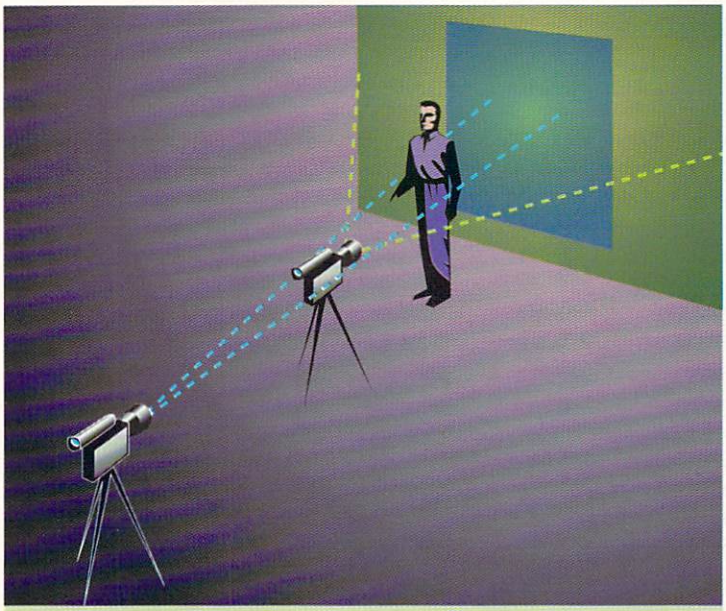


Figure 1

However, for the most part, I recommend using the zoom as if it were a bag containing an infinite number of fixed-angle lenses. Select the angle of view that will give you the best picture. Then leave it alone.

Feature film director of photography Ross Lowel helps his students learn the proper use of the zoom by giving them an assignment to shoot a short program in which they may zoom only once. They must think ahead and carefully plan the best use of that one movement.

In selecting a lens angle, you should consider the strengths and weaknesses of each lens. However, before we can do that, we must make sure we are using the same vocabulary.

Focal Length

The professional videographer refers to lenses with different angles of view by their focal length. Focal length is the distance from the optical center of the lens to the image when the lens is focused on infinity. Infinity is any distance greater than 100 feet in practice. A long focal length indicates that the lens is a telephoto lens. A short focal length means it is a wide-angle lens.

F-Stop

An F-stop is the photographer's way of describing the amount of light a lens allows to reach the film or electronic imager. The light is controlled by changing the size of the "pin hole" with the iris inside the lens.

F-stop numbers can be confusing because they seem to be inversely related to the size of the iris opening. That means the larger the number, the smaller the hole and the smaller the percentage of available light gets through. For instance, it would take twice the light to make a picture at F11 as it does at F8, and twice again as much to make the picture at F16.

Depth of Field

Depth of field refers to the distance between the closest and farthest objects that are reasonably in focus. The focal length of the lens and the size of iris, or F-stop, control depth of field.

You can reduce the depth of field by using a telephoto zoom setting or using a large iris setting (lower F number). To increase the depth of field, use a wider angle setting or a higher F number.

Prime vs. Zoom

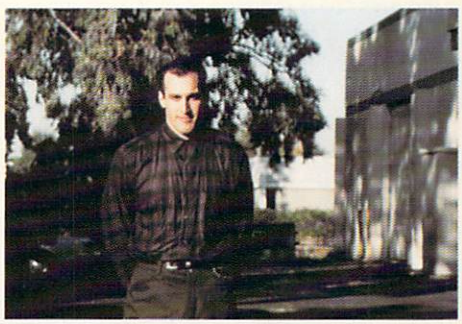
Most feature motion pictures are shot with fixed focal length or prime lenses. When a closer shot is needed, camera operators exchange the lens for one with a longer focal length, that is a more telephoto lens, or move the entire camera toward the subject.

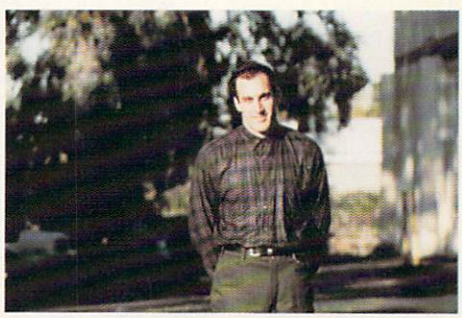
Most video cameras are equipped with a zoom lens, more properly called a multi-focal length lens. (The term zoom comes from one of the first manufacturers of multi-focal length lenses for the infant television industry, the Zoomar Company.)

A zoom lens incorporates both wide-angle and telephoto. To get a closer shot with a zoom lens, it is not necessary to move the camera. Simply choose a longer, more telephoto setting.

With every advantage there is normally a disadvantage. In this case, the zooms usually give up some sharpness to get their flexibility. However, most video cameras cannot reproduce more than 800 lines of resolution and their output will not be blown up to the size of a motion picture theater screen. So the zoom's available sharpness is more than adequate.

Because the zoom lens requires additional glass elements to work, it usually does not pass light as well as a prime lens of the same length. That means the primes used for movie work can usually make pictures with less light. Once again, the zooms hold their own because the video electronics can make up the difference.





The top photo, using a wide angle, has greater depth of field—both the subject and background are in focus. The bottom photo, using a longer focal length, shows less depth of field—the subject is in focus but the building and tree are not.

Communicating with Lenses

Footage of firefighters struggling to save a blazing building will hold the viewer's attention no matter what the skill level of the camera operator. It is on the routine assignments, such as talking heads, that we have a chance to use our skills to help direct the viewers' attention toward the message at hand.

Let's look at two focal length selections that will give about the same picture of a person talking to the camera, but can result in vastly different emphasis and levels of communication. First, we'll look at the shot using a wide-angle setting with the camera placed close to the subject. Then, we'll back the camera off and look at the same shot through a longer lens. See Figure 1.

In the wide-angle shot, we see more of the background, and because of the lens's greater depth of field at this setting, both the subject and the background are in focus. This might be good if the subject is outdoors speaking about the activity going on behind him, or it could be bad if the background is distracting.

There is also a possibility of the kind of facial distortion made famous by the television commercials in which comedian Jim Varney talked to his friend Vern. That distortion is caused by working too close to a very wide-angle lens. With the telephoto setting we have the same picture of the speaker, but the angle of view of the longer focal length allows us to see less of the background. Because the longer focal length has less depth of field, we can choose to throw the background out of focus while maintaining a sharp image of the main subject.

Using the longer focal length has a number of other advantages. First, this setup may make the speaker's facial features more pleasing. Most portrait photographers get their best results with longer lenses. Second, if the subject is reading cue cards or a teleprompter, the back and forth distance the eye must move to read each line is shorter and far less obvious.

Finally, if the project is an interview in which the subject is talking to an interviewer sitting next to the camera, the longer distance between the camera and the subject produces a more intimate shot with less profile.

What's Normal

We have all seen the television traffic report in which a camera photographs a line of cars on the freeway. The cars look so close together that it seems their bumpers must be touching. This effect is called foreshortening. It is a result of using a long focal length or telephoto lens.

As we shorten the focal length, the cars seem to move apart until they match the image seen by the unaided eye. That is called the normal setting for that lens and format. A normal lens on a camera using 35mm film has a focal length of about 52mm. For 16mm film and most 2/3-inch video cameras, the normal focal length is 25mm.

If we continue to shorten the focal length, the cars will continue to move apart. An extremely wide-angle lens can make them appear blocks apart.

This same effect will cause a car driving toward the camera at constant speed to appear slower on a long lens and faster on a wide-angle. *The American Cinematographers Manual* contains extensive tables showing how to adjust for this difference.

Shake that Body

Picture steadiness is another factor that can be directly related to focal length. The longer the lens, the more a given amount of shake will show up in the picture.

The effect is particularly important when working with handheld cameras from an unstable platform such as an aircraft, boat or car. It is usually best to use the shortest lens possible.

There are a number of devices available to steady the image in such situations. Most, including the Steadicam Jr. and a variety of aircraft mounts, work by providing a steady platform for the camera.

The latest technologies involve steadying the image produced by a vibrating camera. Some video cameras do this optically. They use principles developed to aid military observers looking through binoculars from a helicopter. The smooth image is produced by passing the light through a prism that is connected to a gyroscope. The prism moves to counter the vibration.

Digital image stabilization (DIS) is an antivibration development offered as an option on some newer cameras. It involves the same technology that moves the picture during a push-on or push-off digital wipe and takes advantage of the fact that the picture-making chips see a larger picture than they transmit. The visible

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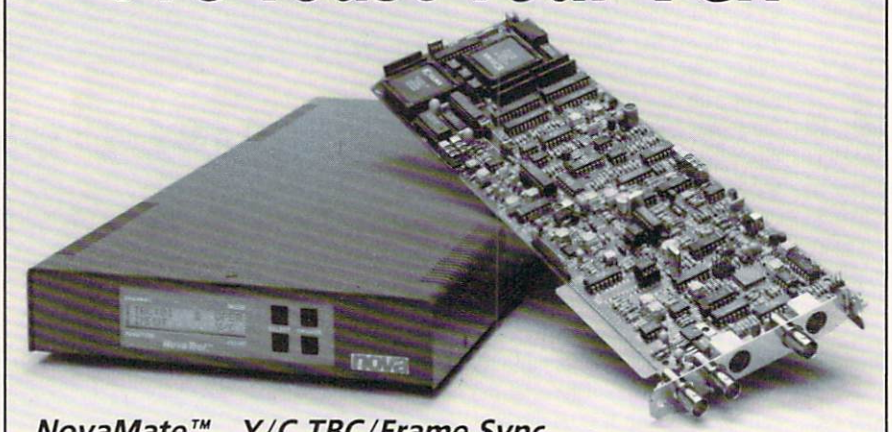

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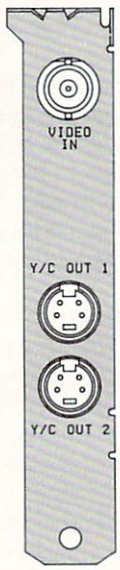

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picture is moved digitally in several directions within that available image to counteract the camera movement. (My apologies to the techies among us for the oversimplification.)

You can produce steadier-looking pictures whenever you are using a zoom lens by watching the edge of the image. As you push toward telephoto, any objectionable movement will show up first where the picture meets the non-moving frame. You can save the shot by stopping the zoom before the vibration becomes objectionable in the center of the picture.

Filter Facts

If light is the metal from which we make pictures, then filters are the tools that help us give it shape and form. Placed on the front or back of the lens, they can change the sharpness, contrast, and color tone of the final product.

The two most-used filters—and ones I would not want to be without— are the 1-A and the polarizer filter.

The 1-A or skylight filter is basically a piece of clear glass whose main job is to protect the lens' front element. As a side benefit, it will slightly reduce the blue tint when a camera that's been color balanced for sunlight is turned into the shade.

The polarizer is a jack of all trades. By reducing the glare, it allows the subject's natural colors to come through. It is often used to take the glare out of the sky and make clouds more prominent. It also will reduce the glare from a paved road, grassy field or the tables in a conference room.

Properly used, the polarizer will reduce or eliminate distracting reflections so we can look through a glass window. It can even be used as a first line of defense against the shine of a bald head.

Low-contrast filters can sometimes bring out details in dark areas of your picture. They can often help lighten shadows when photographing people under the midday sun.

Graduated filters (or grads) are filters in which the color or filter effect is stronger at one edge than the other. They can be oriented in front of the lens to darken, lighten, or color just part of the image. They are used among other things to cut the brightness of snow, give greater color to sunsets or darken an overly bright sky. I have deliberately used the words "can" and "sometimes" because the secret of using filters successfully is experimentation. They might not work every time, and it is only through practice that you will learn to recognize when they are appropriate and which ones to use.

You can see the effects of many different filters on various subjects in the instructional videotape, *Which Filter Should I Use* produced by the Tiffen Filter Company (it is available from most large camera stores).

Fade to Black

So much of television is based upon shooting skills that it is hard to understate the importance of understanding the basics of lenses. Knowing the terms and the concepts associated with camera lenses will help you to better plan your shots.

A knowledge of how F-stops and focal lengths relate to depth of field, for instance, lets you take command of the message that you are trying to communicate with your camera.

Videographers have been given a nearly perfect tool in the zoom lens. It allows you to have a bag full of prime lenses at your disposal without the expense and hassle of having to own and work with multiple lenses. All that's required to reach into that bag and pull out the shot you desire is knowledge of the basics of lenses.

Dick Reizner is an award-winning freelance cameraman. With more than 32 years of experience in shooting film and video, he has won an Emmy, an ITVA Award of Excellence, a CINE Golden Eagle and other awards. Reizner is also the author of the popular "Tips To Clip" column in AVVideo magazine.

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ToasterCG & MONTAGE:

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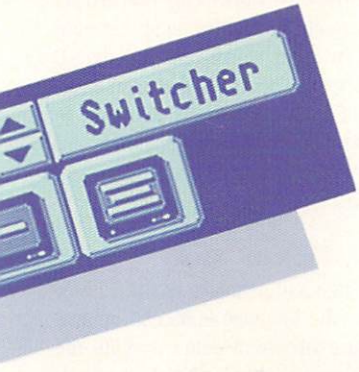

By Brent Malnack

A few years ago, the thought of using desktop-computer-based video hardware and software for even the simplest video tasks was foreign to those running the vast majority of broadcast and post-production facilities in this country. Even in applications that would have made inquiring minds ask about the viability of microcomputer solutions, there was little if any evidence of a shift from the status quo. As the personal computer began to populate the desks of corporate America, running spreadsheets and replacing typewriters, one would have thought that the personal computer would have been a natural for managing databases like edit decision lists and creating type, like character generators.

A few visionaries saw the potential of microcomputers, regardless of the platform, and attempted to change the post-production status quo. But the shift has been gradual and is ongoing. As a result some post houses have reevaluated their approach to making video. More importantly, the efforts of these visionaries have resulted in the creation of a whole new group of video users—the personal video producer—which has emerged with tools every bit as powerful as the one-box-one-function video devices that remain entrenched in some traditional video post houses.

No where has the performance of desktop video solutions shined brighter than character generation. In fact, the ability of some of today's desktop video tools to create stunning video titles is so refined that the makers of standalone character generators have sought out new niche markets to supply their wares.

Enter the Toaster

In the autumn of 1990, NewTek released the Video Toaster, which among other things included ToasterCG. Although the quality of the character generator was impressive, the original ToasterCG was not mature or easy-to-use.

With the introduction of Toaster 2.0, NewTek added more features to the CG, and third-party products, such as PreVue Technology's Breadboard, which enabled ToasterCG to begin closing the gap between the desktop and standalone titlers.

The Breadboard was significant because it provided access to the Toaster's alpha channel, allowing for the use of ToasterCG in tandem with larger switchers. (For a desktop-based production system, four video channels is more than adequate. However, high-end, post-production facilities often roll many tape machines simultaneously. Therefore, before the Breadboard, the Toaster was an unlikely choice as a character generator in these facilities.)

The professional, expensive CGs maintained their edge on the Toaster mainly due to their scalable font support.

With NewTek's recent 3.0/Toaster 4000 release and the addition of PostScript font support, the Toaster finally finds itself shoulder to shoulder with the standalone CGs in all applications.

When teamed with the power of the Montage titling software from InnoVision Technology, ToasterCG is complemented in a way that gives personal video producers a bevy of titling fea-

tures and functions. Together, the programs elevate the desktop system to a level that was unimaginable when the best a personal computer could do was put 80 characters on a line.

Comparing and Contrasting

The Toaster 4000 CG is quite powerful compared to previous versions. In addition to PostScript font support, NewTek added better alpha channel support, a mouse-driven interface and direct support of ToasterPaint brushes. These new features make the creation of composited pages faster. Additionally, the mouse-driven interface is easier for novices to use.

However, there are a few weaknesses in the ToasterCG. Because the interface remains monochrome for the most part, complex pages with layers of text quickly become hard to edit. Placing multiple ToasterPaint brushes can become difficult as well, because only a bounding box representation of the brush is provided. After a while, it becomes difficult to know which element is which.

In contrast, the Montage CG excels in these areas. Sporting a color interface, pages are easily discernible during the editing process. As brushes or images are placed, they are completely visible in an Amiga HAM representation. Although they suffer from fringing and don't look great, it is far better than seeing nothing at all.

ToasterCG only displays bounding boxes, not images, when compositing text and images. As a result, users may find it hard to compose pages on occasion.

Perhaps, the importance of seeing brushes as they are placed can best be illustrated with a real-life anecdote. Recently, a group of college students in a television production class were asked to create a framestore page with a background image, a ToasterPaint brush and multiple fonts on a page. Because they were using the ToasterCG for the project, some students had difficulty.

In the ToasterCG, when a ToasterPaint image is to be used as a background, it is not visible until the point of rendering. This made placing text in specific areas of the screen a hit-and-miss procedure.

Additionally, if the font was too large to fit where it was desired, a new font needed to be created in the proper point size. Again, this is pretty much a hit-and-miss procedure until the size is right. Although ultimately the end results are similar, creating the same page in Montage is much faster.

Real-Time Scalable Fonts

With Montage, fonts are mouse-scalable in real time. By simply placing the mouse on a portion of the text bounding box, it can be scaled interactively. Not only can the text be scaled proportionally, it can also be scaled non-proportionally. In other words, each of the 10 included typefaces can be dragged into an enormous variety of looks, from tall and thin to short and heavy. This scalable approach can reduce the amount of time needed to place text in a specific area.

Gradient-Filled Text

Unlike the single-color nature of the Toaster PostScript fonts, the Montage fonts can be gradient-filled with a variety of patterns. With the Toaster 4000, NewTek added multiple font colors per line of text, but the characters themselves must be limited to a single color.

The Toaster continues to support the loading of Chromafonts, but they cannot be scaled due to their bitmap nature.

With Montage, two colors can be selected and the ramp between them can take the form of top-to-bottom or even diagonal fades. Like the ToasterCG, Montage allows multiple colors on a line, but Montage also permits multiple, different, gradient-filled characters to reside on the same line. These multiple color fonts and gradient fonts also can be used in scroll pages with Montage. Currently, the Toaster scroll page is limited to one color.

In addition to the great text handling tools, Montage has a box tool that can be used to place multicolor boxes on the screen. These can be used as backdrops for text and can even have beveled edges.

This tool greatly reduces the time involved in creating a framestore page because it eliminates the need to enter ToasterPaint to create the box.

Where's that @%$#*! Page?

Sometimes it becomes difficult to find a specific page in the ToasterCG. You are

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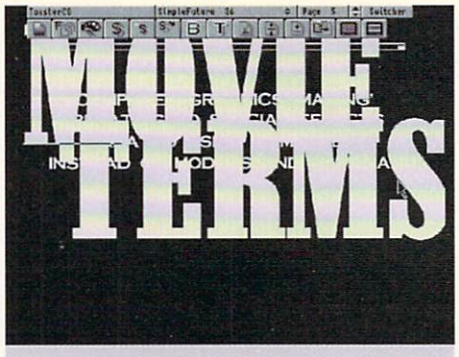
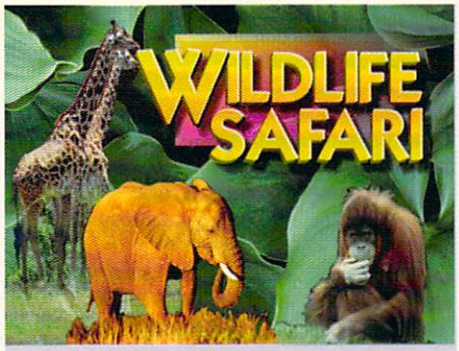


ToasterCG has problems showing multiple layers of text with varying degrees of transparency.



One Montage advantage is that it allows text and images to be composited.

given a few key words in which to identify pages from the Load CG Page requester. This is not a problem most of the time, but can prove difficult if you're working with many similar pages.

Montage includes a handy viewing utility that displays nine miniature images of the pages. These representations are in full color, allowing page identification immediately. By clicking on a given page image, the real page is loaded for further editing or display.

Montage includes a page sequencer that can display pages for a user-definable amount of time, and perform a Toaster effect between pages. This sequencing capability would normally require a third-party program, such as T-Rexx Professional. Although not as powerful as most of the Toaster sequencers, it might do all you need it to. It is certainly capable of assembling framestores for a real-estate type show, or for wedding videographers assembling photos of the bride and groom.

Multi-Font Support

Both the ToasterCG and Montage support multiple font formats. ToasterCG can load PostScript, ToasterFonts, ChromaFonts and Amiga IFF fonts if they are first converted. Montage supports the proprietary InnoVision scalable fonts, ToasterFonts and ChromaFonts; Amiga IFF fonts also can be used if converted first. With the addition of the PostScript Module, Montage could also use all of the included PostScript fonts that come with the Toaster 4000.

Where to Go

Both of these programs are fantastic, but there are still some features I'd like to see. Free-form rotation of text and graphics would be incredibly useful. If nothing else, hard rotation in 90 degree increments would be nice.

Texture Mapping

Having the ability to texture map the faces of fonts also would be helpful. Thus, a user could load a framegrabbed image, such as fire, and have it as the font's surface color.

Beveled Text

Another nice addition would be a beveled edge on the fonts. Currently, Montage allows graphic boxes to be beveled but not the fonts.

Export Geometry

The ability to export the text as a LightWave 3D object file also would be handy, particularly in the case of Montage. Once text is set to the proper width and height, it could be saved and loaded into LightWave as an object.

Real-Time Italicizing

Both the ToasterCG and Montage support the loading of italic fonts. However, it would be a lot more useful if the current text could be tilted to the desired angle.

Will some of these features make it into future versions of ToasterCG or Montage? It is likely that many of them will be added to the programs in the coming months.

Montage and the ToasterCG are two great programs. When combined, the two programs give Toaster users the titling power that only a few years ago came in the the form of a stand-alone character generator costing tens of thousands of dollars. Montage, with its color interface and real-time scalable fonts, and ToasterCG with its wealth of fonts to choose from, make character generation on the Toaster both easy and powerful.

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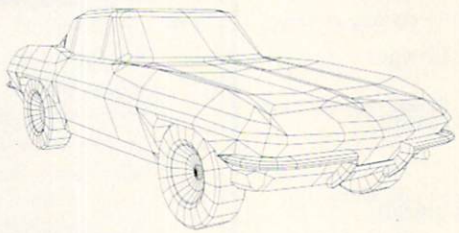

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ToasterCG Advantages

- PostScript font support:
  Load any PostScript Type 1 font.
  300 fonts included.
  Incredible assortment of PostScript fonts.
- Smooth Scroll:
  The Toaster's scroll page is clean and smooth.
- Crawl Pages:
  Crawl pages are handy for information.

ToasterCG Disadvantages

- No Crawl Page:
  To create crawl pages, Toaster CG must be used.
- Not as clean Scroll Pages:
  Although 4,096 colors can be used, scroll pages are neither as smooth or clean as ToasterCG.
- PostScript Optional:
  To use PostScript fonts, a separate module must be purchased.
- Cost:
  Montage must be purchased separately from the Toaster, but it is well-worth the price ($499.95).

Montage CG Advantages

- Color Interface:
  With Montage, the page is always visible in a HAM-color preview mode. This is perfect for text placement, sizing, color and transparency adjustments.
- Real-Time Scalable Fonts:
  Text can be resized interactively. This flexibility speeds the page-creation process.
- Gradient-Filled Text:
  Text can be filled with many gradient patterns on a character-by-character basis.
- Multi-Color Scroll Text:
  Scroll text can combine up to 4,096 colors, including gradient-filled, scrolling text.
- Graphics Tools:
  Built-in beveled boxes aid in the design of attractive pages quickly.
- Custom D2 Software Drivers:
  InnoVision's proprietary software drivers actually enhance the Toaster's output quality.

Montage CG Disadvantages

- Monochrome Interface:
  The interface consists of eight colors, none of which are used in representing brushes or images.
- PostScript Fonts:
  Fonts aren't real-time scalable, so those in different sizes need to be created one at a time.
- No Visible Backgrounds:
  Backgrounds are not visible until rendered. This is a problem when placing text precisely. The constant re-rendering process eats up valuable time.
- Single Color Text:
  Although text can be any of more than 16 million colors on a character-by-character basis, each character can consist of only one color.
- One Color Scroll:
  All text on a Scroll page is limited to one color.

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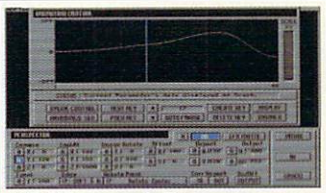

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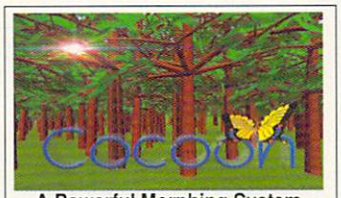

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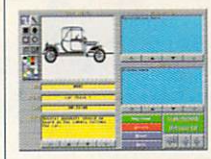
A full-featured CAD program. Includes: Contractor's Upgrade, HomeBuilders Library 1 and DeckBuilders CAD Design and Estimating System for Decks. From a room addition to a cluster of condos; HomeBuilders CAD makes it easy to design, change and estimate your next project. Features include: •20 acre drawing area. •Accuracy to 1/60th inch. •Supports buildings over 200 stories high. •Over 300,000 layers. •Over 60 predefined doors and windows. Contractor's Upgrade allows you to have up to 1000 items (instead of 450) per layout. Library 1 is a library of furniture and custom kitchen cabinets. AmigaDOS 2 compatible. Requires 2.5MB of RAM. Original list price of over $400.00! T4032

$69.95

HomeBuilders CAD 2

Includes all of the above except Contractor's Upgrade and Library 1. AmigaDOS 2 compatible. With 2 disk drives, requires 1MB, with hard drive, requires 1.5MB. Original list price: $249.00 T2040 **$49.95**



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Why should you buy Video Toaster systems and Video Toaster-related products from Atomic Toaster Catalog?

Because we love Toasters! We don't sell Video Toasters as commodities and leave you without answers to your questions, we use them every day! We are Toaster fanatics who are constantly pushing the systems to their limits. To us, a good Toaster computer system is made for audio, video and print applications. The Video Toaster is the most successful video production tool ever. Atomic Toaster wants *you* to be the most successful producer ever. Our combination of production skills and our constant testing and use of Toaster-related products -- will give you the Creative Edge.

Every Video Toaster system leaves Atomic Toaster *completely* configured. Each hardware element is installed, tested, and burned in for 12 hours before we release it. Any additional software is always installed and assigned properly. All you need to do is follow our instructions on setting up the system, connect the necessary cables, turn on the system, and start being productive. Below are three examples of systems we can customize to your specifications. Any substitution is possible. Call us for pricing.

The Starter System "I need just a basic Video Toaster System. I'll need to perform some edits, create some graphics, prepare some title pages, and add pizzazz to general production skills."
Solution: Amiga 4000/040, Video Toaster 4000, 10 Megabytes RAM, 240 Megabyte Hard Drive, 1084s Monitor. Some options might include: TBCs, remote rackmount, monitors, ToasterVision and/or Toaster Toolkit utilities. Call for pricing!

The Professional Animator "Besides using the Toaster as an all-around production tool, I need to create corporate, industrial, and commercial animations. My work has to be broadcast quality and I must have the power to compete with other top competitors in the field."
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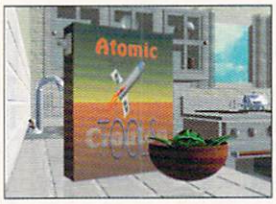
We sell and support all Toaster-related software (see specials listed on the next page) as well as products from NewTek, SunRize Industries, Interworks, Pride, Digital Creations, Blue Ribbon Soundworks, RGB Video, Digital Processing Systems, Nucleus, Prevue, Macrosystems, GVP, JVC, Panasonic, Sony, Roland, Yamaha, Alesis and many others.

Do you want to know about the Video Toaster revolution and what it can mean for you? Call Atomic Toaster Catalog.

SPECIAL OFFER

Every Video Toaster 4000 system comes bundled with our own Crouton Tools, our Audio Production for the Video Toaster video, Dark Horse Productions' QuickStart Tutorials #1 and #2 videos, and Mastering Toaster Technology, the step-by-step bible for the Video Toaster.

CROUTON TOOLS 4000



Build complete scenes and execute these applications directly from your Video Toaster!

Okay, so you own software like ADPro, SFC, Studio 16, Pixel 3D, ImageFX, Bars & Pipes Pro, AmiLink, Personal Anim Rec., ImageMaster RT and others...and they all say that they're ARexx compatible...great!! Now what? You can spend all your time programming in ARexx to make these powerful applications work with each other, or you can continue producing videos like you set out to do.

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A must-have package for serious video professionals!

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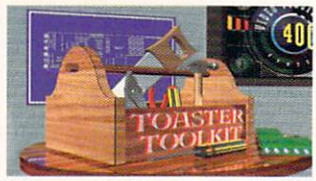
ALL THIS FOR JUST...$1899!

Our Video Toaster 4000 Board comes bundled with "Mastering Toaster Technology," the step-by-step bible for the Video Toaster.



TOASTER TOOLKIT 4000

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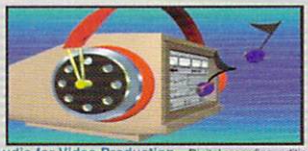

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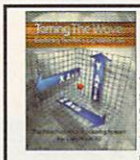

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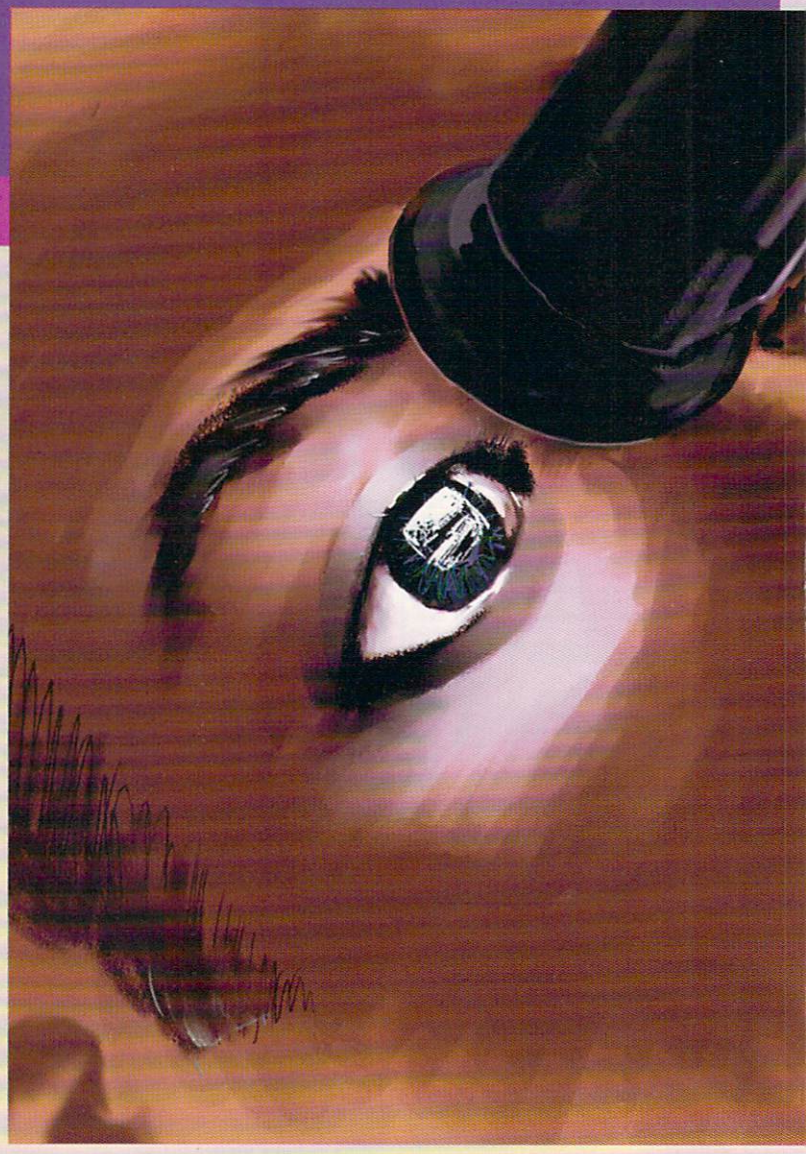
How to Capture the Best Image and Sound:

The Scene



By Cecil Smith

Capturing images and sound is a complex process that requires equal use of both sides of that computer between your ears. Your creative half must worry about the message you're trying to communicate. The logical half is concerned with optimizing the media (audio and video) to make it as transparent as possible during the communications process. To achieve the best possible image and sound, four basic elements must be optimized: the scene, the imaging process, the audio process and the recording process. Each will be examined in this four-article series, beginning with how to match a desired scene with the optical capabilities of a television camera.

The Scene

The determination of the desired scene is the first step in the production process. What do you want to shoot within the scene? What objects do you want in-focus and out of focus? What are the sources of sound that you want to pick up? What light is present, both desirable and undesirable?

To achieve the highest-quality picture and sound, all of these factors must be carefully considered in context with the lighting, imaging, audio pickup and recording equipment that is available. Matching the natural scene environment with your desired scene environment and using the equipment that is available are the keys to getting good results.

Lighting

When it comes to creating the best picture, many start talking about the technical specifications of a camera or recorder. That's not the place to start planning. Hands down, lighting is absolutely the most important factor in getting good pictures. Once imaged and recorded, bad lighting cannot be corrected; almost any other factor can be corrected with enough time and money. The goal of production lighting is to make the 2D image on television look as close to 3D as possible.

Basic three-point lighting—key, back and fill—is a good starting point under almost any condition. Use key light to make objects within the scene brighter so that they appear closer and draw the viewers eyes toward them. Back light creates a highlight around objects, making them stand out from the background and enhances the 3D effect in the finished picture. Fill light raises the overall illumination of the scene to allow selection of objects that are to be in sharp focus by

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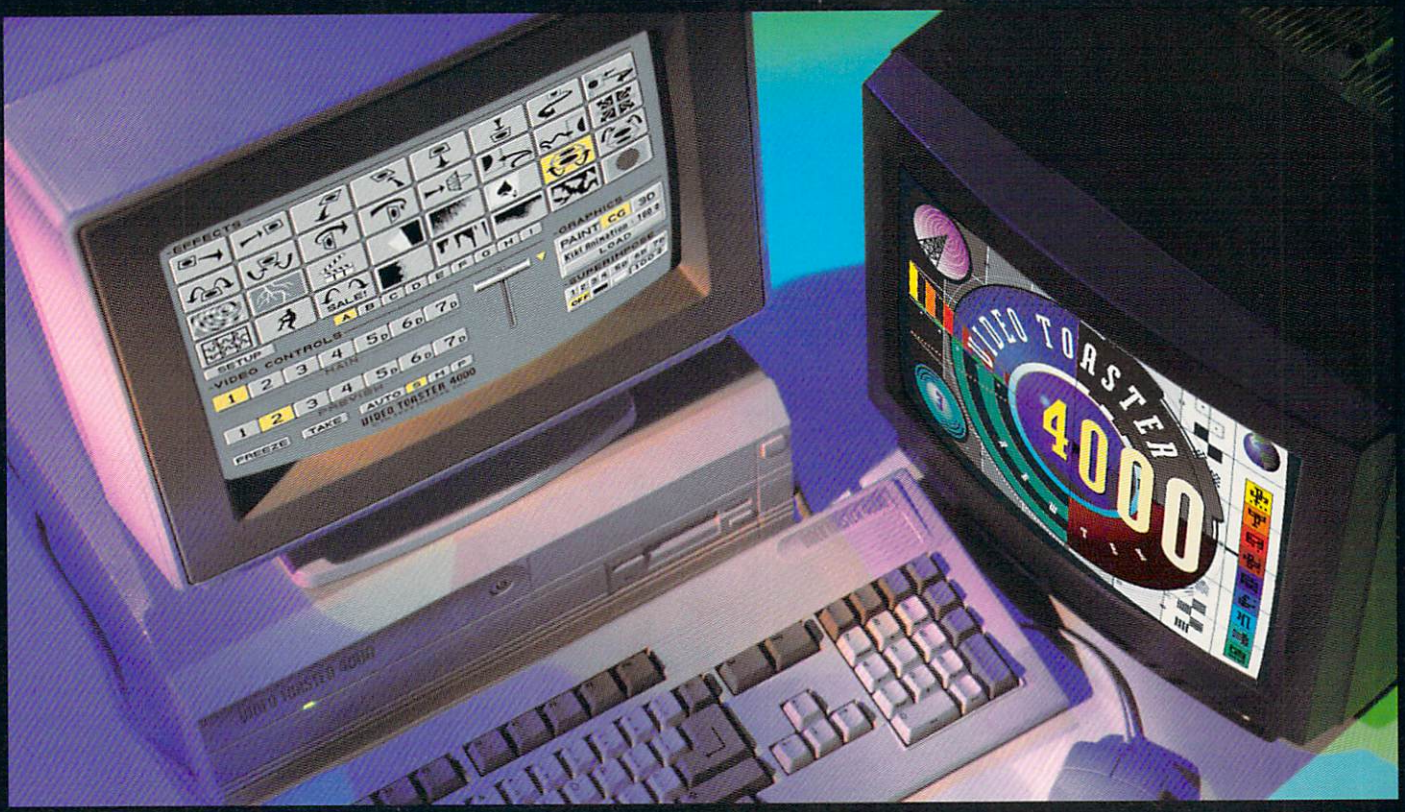

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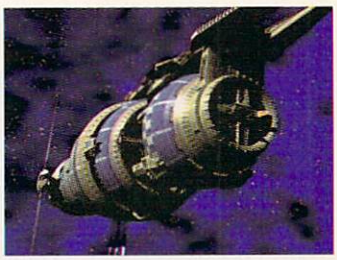

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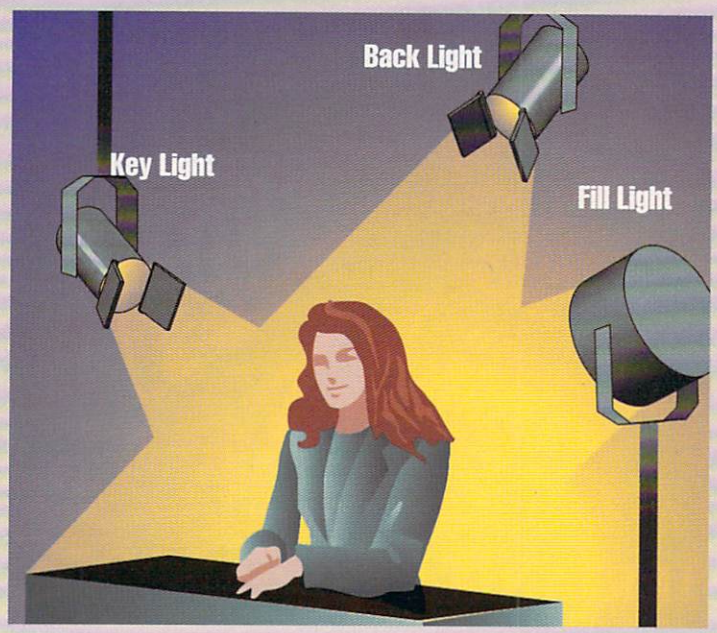
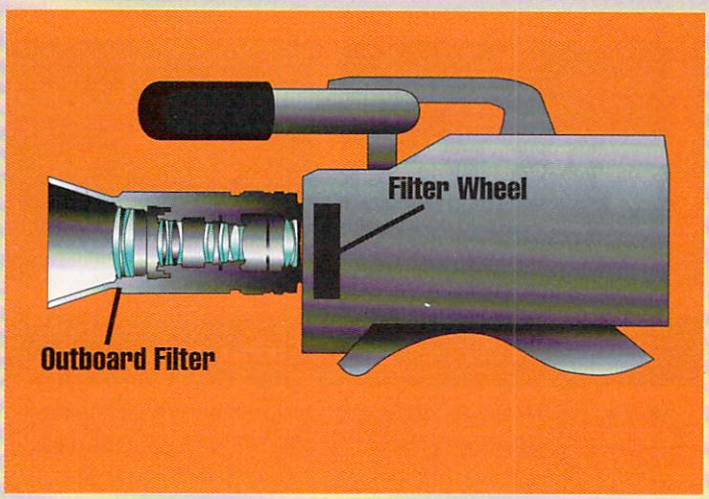
varying the depth-of-field (with the lens iris f-stop setting) and to compensate for the insensitivity of television cameras.

There's a wide variety of techniques that can be used to optimize various lighting conditions. Volumes have been written about television lighting. You must read at least one source and do some creative experimentation if you want the best-looking pictures that are possible from your equipment.



Use key, back, and fill lights for three-point lighting. The key light makes the subject stand out from the background and enhances the 3D effect.



An internal filter wheel and the camera's electronic circuitry work together to correct color.

Imaging

Now that we've considered lighting, let's look at imaging—the process of converting scene lighting information into electrical information. Basically, we must match the environmental and lighting conditions of the scene with the optical and electrical characteristics of a camera (or the imaging circuits of a camcorder).

The optical parts of a camera include filters and the lens with any adapters, extenders or macro options. Let's first talk about filtration and color balance, then drop back to the lens to look at some of the framing options available.

Filtration

A filter should always be mounted on the front of the lens. A cheap filter protects the expensive coatings on the lens elements. A UV/Haze filter is a relatively clear piece of glass that can be mounted in front of the glass lens elements when no other filter is used. Polarizing and special effects filters are also encountered in television production. Outboard color-correcting filters, often found in film production, are usually not used in television production. An internal filter wheel and electronic adjustments take care of color problems. *[Editor's note: For more information on lens filters, see "Through The Looking Glass," by Dick Reizner on page 68 in this issue.]*

Most cameras have a filter wheel mounted between the lens and the imaging devices (CCD chips or camera tubes). This is a metal wheel that holds selected color-correction filters. These filters are selected to match the imaging characteristics of the camera to the lighting conditions in the scene.

The filters in the wheel are calibrated in Kelvin (in 1967, it changed from "degrees Kelvin"). These numbers represent the temperature (in degrees Celsius) to which a perfect, black body, which doesn't really exist, in a perfect vacuum (which also doesn't really exist), must be elevated to approximate the spectral characteristics of the light source being described. It's kind of like steel going from cool to red hot to white hot. That's the source of the numbers on some cameras, but you don't have to worry about the numbers themselves. Simply read the operation manual for the camera to find out which filter is recommended for which lighting conditions.

You'll usually find at least one filter number that has one position with ND after it and another setting of the same number without ND after it. ND means that a neutral density filter is added to the optical path to serve as gray (non-tinting) sunglasses and blocks some of the light from reaching the imaging chips or tubes. Blocking light prevents the imaging circuits in the camera from overloading and allows the camera operator to reduce the depth-of-field when shooting in bright light.

Color Balance

Once the filter on the wheel is chosen to provide a coarse adjustment of the camera response, the white balance and black balance procedures provide fine matching of the response of the camera to the color of the scene lighting. Each camera model has a different way of performing white and black balance adjustments. Some models offer manual adjustment of color balance; others have automatic adjustment on operator demand; another group offers continuous automatic adjustment. Each method has its good and bad points.

Manual adjustment, which is frequently found on professional studio and field cameras, provides the most accurate method of setting color balance but requires training and test equipment to set up the camera. Automatic adjustment on demand, which is available on most professional cameras, provides an easy way to adjust white balance in a scene without test equipment. However, it does not always produce the desired result. Continuous automatic adjustment, frequently found on cameras targeted for the consumer market, offers a reasonable average of color balance from scene-to-scene; yet, it can be easily fooled into incorrectly adjusting color balance by colors in the scene.

Continued on Page 84

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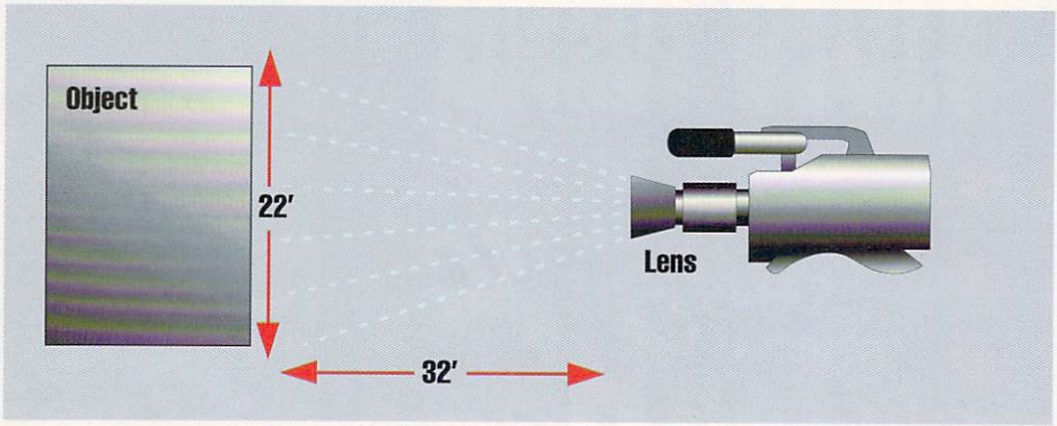
The Scene

The technical procedure for adjusting color balance varies widely from camera-to-camera. Some cameras require a full field of what the operator wants to name as white, while others require only a portion of the field to be white. Some camera operation manuals suggest black balance first, then white balance; others suggest that the order be reversed. (Check the operation manual for the specific camera model that is being used to ensure the proper procedure.)

The placement of the camera and lighting equipment as well as the natural lighting on the scene must be adjusted before attempting to white balance. If the lighting intensity, lighting color temperature, or lens filtration changes, the white and black balance adjustments should be repeated. If the camera moves a significant distance, such as when shooting from a helicopter or an airplane, balance on a white object near the desired scene objects. This will compensate for the atmospheric filtration of both the incident light on the scene and the reflected light on its way to the camera.



In underwater production, the deeper you go, the greater the amount of yellow light that is filtered out. To correct the problem, add a yellow filter to the front of the lens to help balance the light closer to white. Then white balance the camera's electronics to finish the process.

It helps to understand the filtration effects if you think separately about filtered incident light, which falls directly on the scene, and filtered reflected light, which bounces off objects in the scene and is detected by the camera. Think about correcting the incident light with gels and then correcting the reflected light with outboard and built-in filters and white balance circuitry.

The Lens

Now, let's talk about the lens and how it matches the camera to the desired scene. First, let's examine focal length, which determines whether a lens is normal, wide-angle or telephoto. A lens with a short focal length, that is, it has a small number of millimeters, is a wide-angle lens. A lens with a long focal length, one with a large number of millimeters, is a telephoto lens.

Warning: Here comes a little math. A normal, wide-angle or telephoto focal length varies from one imaging format to another (CCD, 1-inch pickup tube) because focal length is related to image format according to one of the following formulas:

$$\text{Focal Length} = \frac{\text{Image Format} \times \text{Object-to-Lens Distance}}{\text{Scene Size}}$$

There's an important practical application for this formula. You can determine the size of the scene that can be properly framed by modifying the formula to reflect the 4:3 aspect ratio found in all current television broadcast standards:

$$\text{Focal Length} = \frac{4/5 \times \text{Image Format} \times \text{Object-to-Lens Distance}}{\text{Scene Width}}$$

$$\text{Focal Length} = \frac{3/5 \times \text{Image Format} \times \text{Object-to-Lens Distance}}{\text{Scene Height}}$$

Let's look at an example. Suppose you have a camera with 1/2-inch, CCD image format chips (as listed in the operator manual or service manual). You want to shoot an object that is 22-feet wide with the camera 32 feet away. The focal length of the lens that is required to shoot under these conditions is:

$$\text{Focal Length} = \frac{4/5 \times 1/2\text{-inch} \times 32 \text{ feet} \times 12(\text{inches/feet})}{22 \text{ feet} \times 12(\text{inches/feet})}$$

$$= 1.16 \text{ inches} \times 25.4(\text{mm/inch}) = 29.46\text{mm}$$

Now, that math wasn't so bad after all, was it? Many cameras have a built-in zoom lens with a focal length that can be adjusted. If a focal length outside the range of the lens is required to complete a shot, an adapter must be used. Telephoto, wide-angle, and close-up adapters are available to extend the capabilities of the built-in lens. These adapters sometimes screw into the front of the lens (where the size of the filter must match the filter size of the lens). Sometimes, some of these functions are available on the permanently installed lens. However, they might create objectionable picture distortions if placed into service while shooting.

A zoom lens is often described by the ratio of telephoto focal length to wide-angle focal length. This zoom ratio often appears in specifications such as 6:1, 8:1, 10:1, 15:1, etc. or 6X, 8X, 10X, 15X, etc. or 60:10, 80:10, 110:11, 300:20, etc. A zoom ratio of 10:1 might represent one of the following combinations, or any other where the maximum focal length is 10 times the value of the minimum focal length:

Maximum Focal lenth	Minimum Focal lenth	Zoom Ratio
(mm)	(mm)	$\left(\frac{\text{Minimum focal length}}{\text{Maximum focal length}}\right)$
100	10	10
110	11	10
120	12	10
150	15	10

The zoom ratio is derived from the focal length but cannot be used to determine the exact minimum and maximum focal lengths. You've got to look elsewhere in the operating manual for the camera or lens.

Once you have optimized the scene and have matched the lens to the scene, you optimize the operation of the circuitry inside the camera. In our next installment, (it's beginning to sound like past Saturday afternoons at the theater, isn't it?), we will examine matching the imaging process with the scene.

VTU

Cecil Smith is a consulting engineer specializing in imaging and television systems, facilities and training. He is the author of Mastering Television Technology: A Cure for the Common Video *and* Answers to Television Technology: An Encore. *He may be reached at 214-231-6804.*

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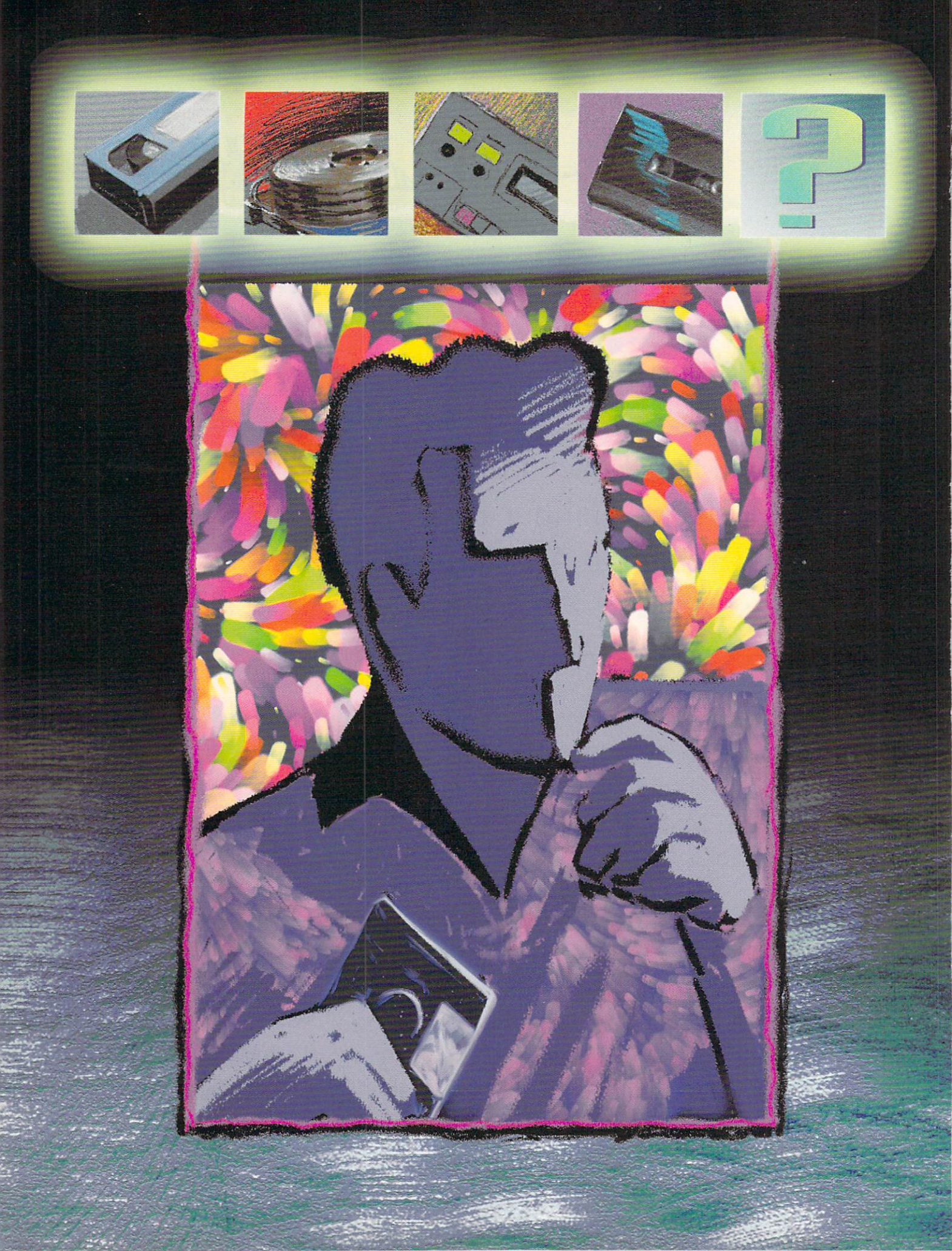

TOASTER ANIMATION OUTPUT OPTIONS

by Matt Drabick

Until recently, most LightWave animators were required to record their animations using a frame-accurate VCR and a single-frame animation controller.

A few with deep enough pockets and the ability to write ARexx scripts could spend $12,000 to $16,000 for an optical disc recorder, such as the Panasonic TQ-3031, and record their LightWave animations.

With the arrival of various digital compression schemes that allow animations to be played back directly from a hard drive or even computer memory, the LightWave animator now has several interesting options from which to choose. The Video Toaster 4000, the Personal Animation Recorder (PAR) from Digital Processing Systems and the Sanyo GVR-S950 are three alternatives many animators are exploring.

Some LightWave users, such as Abracadabra Animations in Greenwich, Conn., have gone to extraordinary lengths to avoid recording animations in a traditional manner. The company opted for a $40,000 solution to avoid recording animations to tape and acquire the flexibility of digital video editing.

While price is certainly a factor in choosing which system to buy, your comfort with working with a VCR or a purely digital device for recording your animations is also an important issue.

Toaster 4000

One of the most significant new features of the Video Toaster 4000 is its ability to play back LightWave frames as low- or medium-resolution HAM8 animations from memory when using the Amiga 4000 and its AGA chipset. Like the Amiga's original HAM mode, which provides a 12-bit or 4,096 color display using only 6 bits of color information, HAM8 is a special display mode found only with the AGA chipset. It displays in an 18-bit mode with 256,000 colors while only using 8-bit file sizes.

To the casual observer, HAM8 is nearly indistinguishable from a true-color, 24-bit image. Because of its relatively small file size, photorealistic, full-screen HAM8 animations can be generated and played back from memory without having to perform single-frame recording.

With 18 MB of memory installed on the Amiga 4000's motherboard, the maximum amount allowed, about six seconds of animation can be played back. By adding more memory using the DKB 3128 RAM expansion board ($374.95 before adding any memory), about 50 seconds of animation can be played back when the board is fully populated with 128 MB of RAM.

While details are scarce at press time, Great Valley Products (GVP) will be releasing a 68040 accelerator board rated at 40MHz for the Amiga 4000 that will allow up to 512 MB of RAM to be installed.

Certain limitations exist when using the HAM8 output for playing back LightWave animations. While it's possible to play back a full-screen animation at 30 frames per second (fps), the deltas, or changes, between frames should be kept relatively small with only about a quarter of the visible screen actually changing or being animated.

Regardless of this limitation, the image quality of HAM8 is surprisingly good and is well-suited for many applications, such as weddings, birthday parties and the like where lower-quality graphics might be acceptable.

Another reason for using the HAM8 option is for performing a quick test to catch mistakes in your LightWave frames before rendering them one at a time to videotape. This approach is certainly a cost-effective method for playing back animations. But, understand that it's not a replacement for performing single-frame recording using a professional VCR and 24-bit files for high-end applications, such as corporate videos and television commercials and programming.

The DPS PAR

The DR-2150 Personal Animation Recorder (PAR) from DPS is an exceptional piece of equipment for recording LightWave animations and playing them back in real-time using a dedicated hard drive. The PAR ($1,995) can output composite, Y/C (S-VHS and Hi8) and component (Y, R-Y, B-Y for Betacam or MII) video, allowing animations to be dumped to videotape without performing single-frame recording.

Continued on Page 88

TOASTER ANIMATION OUTPUT OPTIONS

Because the PAR can accept an external sync signal and has fully adjustable sync and subcarrier controls, it can be used as a source device with a video production switcher, such as the Video Toaster, in an editing suite or even a live television production environment.

DPS recommends using the Seagate 3600A IDE hard drive with the PAR, which brings the total system price to about $2,700. Other hard drives may work with the PAR, but they must use an IDE interface and not a SCSI controller.

Seagate's 3600A is a 540 MB hard drive and is capable of recording about three to five minutes of animation, depending on the amount of JPEG compression used. Controls are provided with the PAR's software for adjusting the amount of compression or Q-factor used.

The PAR uses its own proprietary JPEG compression standard that has been optimized for converting LightWave RGB files into a 4:2:2 digital video format that is well-suited for playing back animations at 30 fps. Because it uses a non-standard version of JPEG, special loaders are being developed for ADPro from ASDG and ImageMaster from Black Belt Systems that will allow the programs to load files recorded on the PAR for image-processing and special effects.

What makes the PAR such a wonderful device to work with is its extremely user-friendly nature. Unlike using a single-frame controller that can require typing awkward and complicated text commands needing exact syntax, the PAR provides an easy-to-use interface for creating and playing back animations.

Both LightWave IFF-24 frames and framestores can be saved directly to the PAR's dedicated hard drive as soon as they are rendered or copied and converted from your Amiga's hard drive.

Once an animation has been saved, it can be played back using VCR-style controls found with the PAR's user interface. Animations can be played at normal speed, paused or advanced a single frame at a time and looped over and over. Both fields or frames can be played back. The playback rate or frames per second can be easily adjusted, allowing animations to be played back at various speeds including 1, 2, 3, 5, 7, 10, 15, and 30 fps for slow-motion and still-image effects. Two counters are included to indicate the elapsed time in total frames played and in minutes, seconds and frames. While not a non-linear editing system, the PAR allows for frames to be added, deleted and inserted. It also allows various animation segments to be appended together.

Finally, the PAR can be used as a video source with the Video Toaster 4000, allowing animations to be played back while overlaying titles and performing Toaster effects. A general purpose interface (GPI) trigger is included for activating the PAR from an external device, such as an edit controller. By adding the DPS Personal TBC IV ($999), users can capture video in real-time from a VCR or other source for performing sequential framegrabbing or rotoscoping work.

The GVR-S950

For Video Toaster users who are more comfortable working with a dedicated VCR for animation recording, the Sanyo GVR-S950 ($2,995) S-VHS VCR provides a good alternative. The deck packs a lot of performance into a neatly integrated package for a relatively low price.

By adding a BCD single-frame controller inside the VCR, Sanyo has eliminated the need for installing yet another card inside your computer, leaving an otherwise used expansion slot free for a time-base corrector, SCSI-2 controller or some other card.

Once the software that comes with the deck has been installed on your Toaster system, you can start recording your LightWave frames to videotape.

One Y/C (for S-VHS and Hi-8) and two composite video input connectors and a pair of stereo inputs are provided. For outputs, the deck provides a single composite and Y/C connector and a pair of audio outputs. An external sync connector is also provided for working with a TBC. Two channels of both linear and FM audio are available and the VCR has a high video signal-to-noise ratio of 55dB.

The GVR-S950 has its own time-code generator and reader, necessary for performing single-frame recording. A single RS-232/RS-422 serial connector on the GVR-S950 is provided for connecting the VCR to the serial port on the back of your Amiga using the cable that's included.

Once the Sanyo's animation-control software has been installed onto the computer's hard drive, a set of text commands must be typed to perform any recording. For those users who have worked with the BCD-2000A animation controller, the commands will be familiar. For those first-time users, it's simply a matter of learning the correct syntax and remembering to put a period in the correct place.

While Sanyo is not promoting the VCR as an editing deck, the GVR-S950's RS-232/RS-422 port theoretically can be used for machine control

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purposes. TAO, makers of the Editizer 2.0 ($2,495), is developing software to allow the GVR-S950 to be used with its editing system as both a source and a record deck with full insert and audio editing capability. Note that while the Editizer 2.0 can talk to the Video Toaster, you will need an IBM-PC host computer to work with the system.

Finally, the Sanyo GVR-950 is well-suited for the demanding task of repeatedly performing single-frame recording without dropping frames. The VCR is well-designed and feels sturdy and reliable. Because of its extra-rugged tape transparent and amorphous recording heads, you can expect many hours of trouble-free operation when using the GVR-S950.

To the Sublime

While certainly on the expensive side (about $40,000 for the hardware, associated software and DAT recorder), the VideoCube non-linear digital editing system from ImMIX is yet another way a few LightWave animators have chosen to output their work.

Abracadabra Animations uses the VideoCube alongside its five Amiga 2000s—two with Video Toasters—for all animation playback and editing production needs.

When the animation house decided to replace its 3/4U-SP editing system with something better, instead of simply buying another VCR-based system Abracadabra looked at various digital solutions. By staying in the digital domain and using digital files, the VideoCube system allows footage to be copied, cut, and pasted with blazing speed. An undo command is even available. In short, it's impossible to make a mistake when editing because changes can be quickly and easily made to fix any problems.

Although a Macintosh is used as the VideoCube's front end, Abracadabra Animations simply converts its LightWave frames to PICT files using Rasterlink from Active Circuits and loads them onto the ImMIX device. Often, LightWave frames are manipulated with ADPro and MorphPlus from ASDG to add effects, such as ripple, before they are saved on the VideoCube. In no way does this image processing prevent them from being stored on the ImMIX device.

Once converted, the VideoCube can be used for playing back LightWave animations while adding real-time video effects. The VideoCube also can sequentially framegrab videotape footage in real-time for rotoscoping work. One hour of video footage with stereo sound is available for editing and playback purposes, and the footage can be sent out as either composite or Y/C video.

Abracadabra Animations has produced animations used in nationally aired television commercials for Sunkist and Mott's Applesauce as well as producing trailers for CBS' *Lonesome Dove* and other television movies.

While the VideoCube is certainly too expensive for the average Video Toaster user, its use by this high-end production house demonstrates the extent to which some animators will go to avoid recording their work to tape.

The Final Frame

Overall, recording LightWave animations has become easier and more affordable thanks to the arrival of the Video Toaster 4000, the DPS PAR and the GVR-S950. Other than the cost of adding more memory to your Video Toaster 4000 system, the HAM8 animation is free and useful for certain applications. Both the PAR and the GVR-S950 cost about the same and offer two attractive methods for playing back LightWave animations.

If you are more comfortable working with a conventional VCR for recording your animations, the GVR-S950 will probably be more attractive. If you like the idea of working exclusively with digital files and can't afford an ImMIX VideoCube, the PAR may be preferable.

For someone with a lot of money to spend and the need for a non-linear digital editing system for performing high-end video editing as well as playing back animations in real time, the VideoCube might be the answer.

Regardless of the approach that's chosen, one thing is clear: The kludge of equipment once needed to record animation to a video media is evaporating.

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Features:

- Three 1/3" CCD image sensor system delivers over 530 lines of horizontal resolution
- New 10:1 2-speed zoom lens (see above) 6-60mm F1.6 with automatic and manual zoom. Also features 20:1 digital zoom.
- High resolution color viewfinder lets you preview and shoot scenes exactly as they are
- Built-in digital TBC (Time Base Corrector) eliminates jitter and skew and assures stable, distortion-free playback
- **Digital Mix** – for soft fade-over between memorized still and moving images
- **Digital Still** – lets you freeze a particular scene for as long as you like, without interrupting sound recording
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EC-1000 PRO

- EC1000 PRO is a stand-alone, cuts-only control track edit controller. Controls any two machines with Panasonic 5-pin and/or Sony Control-L serial editing terminals.
- 5-digit LED display (hours/minutes/seconds)
- Up to 9 scenes can be stored in memory and then executed automatically.
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EC1000 PRO MKII

EC1000 PRO MKII has all the features of EC1000 PRO ***Plus-***

- Can read Sony's 8mm RC time code. Sony camcorders (CCD-V801 and future models) that output RC time code can be used, resulting in 3 frame accuracy.
- 7-digit LED display (hours/minutes/seconds/frames)
- Built-in RS-232 serial control for connection to IBM or AMIGA computer and Future Video's Edit List Manager series software providing a fast intuitive means to create and manage EDL's (Edit Decision List) of 999 events.

EC1000 PRO/TC MKII

- Same as EC1000 PRO MKII except also has a built-in SMPTE time code reader totally compatible with Professional SMPTE time code. With low-end industrial VCRs like Panasonic AG-1960, AG-1970 frame accuracy is achieved repeatedly without tape slippage errors.

EditLink 3300

- With EditLink 3300 true A/B Roll (3-machine control) editing is now possible using low-end industrial, and prosumer VCRs and camcorders.
- EditLink 3300 can control a variety of machines including those with Panasonic 5-pin and Sony Control-L Protocols, as well as selected RS-232 serial VCRs.
- Provides three external programmable GPI triggers.
- EditLink 3300 connects to your computer via a built-in RS-232 serial port. It is platform independent so it will work with AMIGA, MACINTOSH or IBM.

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  Digital Still – lets you freeze a particular scene for as long as you like, without interrupting sound recording
  Digital Zoom – Thanks to digital processing, you can enjoy shots with ultra-high magnifications of up to 100:1
  Digital Gain-Up – delivers clear, distinct images in low-light levels, even down to 1 lux!
  Digital Strobe & Digital Wipe – add professional effects to your shooting.
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- Automatic Iris plus manual control for fine adjustment
- Variable high-speed shutter from 1/50 to 1/8000 second.

AG-1970
S-VHS Hi-Fi Editing VCR

- Playback and record in S-VHS, which delivers 400 lines of horizontal resolution and exceptionally detailed images.
- Uses Amorphous video heads which are clearly superior to that of conventional ferrite heads because the magnetizing strength of the amorphous head is much greater. The Amorphous video heads deliver rich, vibrant color reproduction and a high S/N ratio.
- Built-in Digital Time Base Corrector effectively eliminates jitter and distortion. Playback is high quality, stable and with natural colors.
- Built-into the circuitry is a digital filter which helps the AG-1970 achieve even more accurate Y/C separation. Also a noise filter is included in the circuitry.
- Features Hi-Fi stereo sound with a frequency response from 20Hz to 20,000 Hz and a 90 dB dynamic range. Besides nearing CD quality audio the AG-1970 also has stereo recording level control, headphone monitor terminal and mic input terminal.
- Does assemble edit, video insert and audio dub. Flying erase head for smooth, clean, seamless edits. 5-pin edit terminal makes it easy to set up an editing system.
- Jog/shuttle Dial for varied playback from slow motion to high-speed search (shuttle) and frame-by-frame picture control in forward and reverse (Jog).
- Unlike the AG-1960 the AG-1970 outputs the audio track during search operations for culng and quick confirmation of audio recording.
- What makes the AG-1970 the perfect editing VCR? The advanced dual-loading mechanism features a quick response time, exceptional tape protection, remarkable tape control accuracy - all make for outstanding editing precision and ease.
- Automatic head cleaner removes dust and other particles from the heads to help maintain optimum performance.

WJ-MX30
Digital A/V Mixer

The Panasonic WJ-MX30 A/V Digital Mixer is designed for use in producing special-effect images by utilizing the built-in frame synchronizer and other digital processing circuits. In addition to the mix effect of the conventional digital A/V mixer, the WJ-MX30 offers such features as luminance key function, digital effect, downstream key effect, wipe effect, fade control, memory and many more. With the WJ-MX30 and your imagination there are many possible function combinations which are left to your creativity.

Features:

- Combination of 7 basic keys can create 108 different wipe patterns.
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- Automatic Take button with adjustable transition rates.
- Wipe boundary effects: soft/border 18 matte colors available.
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- Automatic fade button with adjustable rates.
- Picture-in-picture function allows the B-bus picture to be compressed in selectable 1/4, 1/9, 1/16 size of a full screen
- Digital effects including strobe, still, mosaic/scramble, negative/positive, paint, monochrome, and AV synchro.
- Double picture-in-picture function compresses both A and B sources. Plus every mode can be trimmed with hard/soft edges borders, shadow, shadow and border.
- Joystick positioner allows moving wipe location.
- Audio Follow allows audio mix to be synchronized to A/B rolling.
- Video, Audio and Titles can be individually or synchronously faded.
- Has eight separate memories that enable virtually instant recall of frequently used effects.
- Color corrector enables adjustment of color in images from A or B bus.
- Built-in four channel audio mixer with four audio level adjustments. Also has visible LED audio level meter.

JVC GY-X2
3-CCD S-VHS CAMCORDER

- Three 1/2" CCD image sensor delivers 650 lines of horizontal resolution
- New micro-lens technology provides exceptional sensitivity of F7.0 at 2000 lux and new LOLUX mode lets you shoot with almost no light! Now you can shoot superb footage with excellent color balanced at a mere 3 lux illumination
- Variable Scan View allows flicker-free shooting of a computer monitor.
- Quick Record Mode - when turned on the camera is set to the auto iris even if lens is set at manual. Also activated is (ALC) Automatic Level Control and EEI Extended Electronic Iris which provides both variable gain and variable shutter. Now you can shoot continuously from dark room to bright outdoors without having to adjust gain, iris or ND filter.
- Full Time Auto White circuit lets you move from incandescent to fluorescent to outdoor lighting without changing white balance or the filter wheel.
- Genlock input allow synchronization with other cameras.
- Dual output system allows camera output to be connected directly to an external recorder

SONY
PROFESSIONAL S-VHS SYSTEM

SVP-9000
S-VHS Player
and
SVO-9600
S-VHS Player/Recorder

The SVP-9000 S-VHS player and SVO-9600 recorder are designed as multi-purpose machines with the use of various optical interface boards. By selecting one or more of a particular board, they become dedicated machines for satellite recording, office viewing, video library, sports analysis and editing. At the same time, they adhere to Sonys professional VTR concept of reliable mechanism, rigid construction and easy operation, ensuring reliable and reliable operation in the industrial and professional environment.

They both feature:

- Using the S-VHS format, they deliver superb picture playback and recording. With newly developed Digital Y/C separator maintained picture quality even in composite.
- Newly developed video cross talk canceller eliminates color blur providing more accurate color and sharper images.
- Four channel audio system – Two Hi-fi channels with a dynamic range of 90dB and two linear channels with Dolby Noise Reduction.
- Two direct-drive reel motors provide rapid response and smooth operations. Mode transitions such as STOP to REC, FAST FWD to PLAY, STOP to REWIND are instantaneous.
- Search dial allows picture search from -10 to +10 times normal speed.
- SYNC IN for synchronizing with other video sources
- Automatic repeat and automatic rewind can be accomplished with programmed operation.
- There is a TIMER switch for either REC or PLAY (SVP-9000 PLAY only) when selected automatically executes the selected mode when the power is turned on. This is very useful for unattended operation such as satellite recording.
- Auto head cleaner – each time a cassette is loaded or ejected, a cleaning roller automatically passes over the video/FM audio heads removing tape residue and providing preventive care of the tape heads.
- For secure connections, they employ a locking connector for S-Video input and output terminals.
- The SVO-9600 features sensor recording. When video signals are input, it automatically starts recording.
- 19" EIA rack mountable plus adjustable front controls.

Optional Interface Cards:

- **SVBK-100** 33-pin interface board allows remote control of basic VTR functions.
- **SVBK-120** RS-232 interface board allows for machine control from a computer.
- **SVBK-140** RS-422 interface board allows either machine to be configured into any professional system.
- **SVBK-150** Digital Noise Reducer board reduces jitter, noise and Y/C delay and provides clear, crisp still frames.
- **SVBK-160** SMPTE Time Code interface board (can only be used with SVBK-140 board).

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NRG

970 Power-MAX

The 970 Power-MAX is designed for power-hungry professionals who have high-current draw situations and long run times.
- Highest capacity quick-charge capable 12 Volt 14-AMP sintered nicad power pack (removable).
- Rugged high-grade, black leather belt case; chassis assembly with dual 3-pin XLR inputs for pack interchange without shutdown.
- 2,500-cycle cell life provides lowest cost per cycle.
- Microprocessor-controlled 5-step multi-colored power indicator display.
- Belt with cellpack weighs a comfortable 7.5 lbs.
- Charge in little over two hours with the optional 650-III Intelliquick Fast charger.
- Dual outputs allow simultaneous powering of two devices (eg. camera and light). Output configurations include cigarette lighter and 4-pin XLR in any combination.
- Includes Power-MAX belt and power chassis, 14-amp cell pack in 12V or 13.2 volt configuration, model 600 overnight charger, comprehensive owner's manual. Fits waist size 29"-44".

VARI-LITE PRO

Professional DC On-Camera Light

Thanks to on-board control IC's using NRG's Light-Gate technology, light intensity can be infinitely adjusted by the user within a range of 10% to 100% of the lamp's rated power. Now you can instantly adjust light output to exactly meet changing light requirements, all without changing hot bulbs or fussing with power rabbit diffusion filters. Best of all, the Vari-Light Pro virtually eliminates color shift and dramatically conserves precious battery power by using only the power required for the selected light level. Accomodates bulbs from 20W to 200W DC.
- Prismatic Pyrex dispesion grid provides smooth even light ouput and reduced glare without changing light intensity.
- Sturdy all-metal click tilt mounting bracket with unique ratchet action. Eliminates shake during action shooting.
- Front retainer assembly pops off for instant bulb access without the bother of screws.
- Rugged milled aluminum light head disperses heat and provides years of service under adverse conditions.

Power Station Series

Designed to replace expensive original-manufacture AC power supplies, the affordable Power Stations deliver precisely-regulated 12-volt DC power from AC sources worldwide. High-current capability allows for powering not only large camcorders, dockables, decks, and cameras, but lights, monitors, and other high draw 12-volt equipment as well. The stations provide up to 9 amps of precisely regulated DC power eliminating the need for battery power in stationary applications where an AC source is available. The Power Stations exceeds all original manufacturer performance specifications.
- Available in different configurations: The 12560 features a single cigarette or 4-pin output and up to 5 amps of output current. The 129100 features dual outputs in any combination of cigarette or 4-pin and 9 amps of output current capability.

- High-current output
- Worldwide voltage selection
- Rugged steel case
- 4-pin or cigarette lighter outputs
- Lighted power switch

Power Station-2 Series

Just plug the PowerStation-2 into any AC outlet in the world and out comes perfectly regulated 12-volt DC power through four 4-pin XLR connectors and one cigarette lighter connector. It uses an advanced pulse-width-modulated power supply which allows for ultra-light weight and small size . It operates with little heat even at full output. The PowerStation-2 is the ultimate multiple-output professional power source for cameras, decks, lights, monitors, and a host of other video accessories.
- 85-264 volts worldwide auto-adjusting input.
- Fully protected from overcurrent and over temperature.
- Ultra-light weight - under 3 lb.
- Outstanding 300,000 hour mean time between failure is far in excess of any other manufacturer.
- Ultra-efficient PWM regulation generates far less heat than linear type supplies.
- Provides the ultimate in performance and reliability in a universally compatible and compact package.

NEW! Canon L2

Introducing the new Canon L2 Hi-8 Camcorder with VL Mount for interchangeable lenses, RC Time Code and digital effect for unlimited creative freedom.

- 1/2" CCD with 410,000 pixels delivers over 450 lines of horizontal resolution
- VL Mount System allows use of a full range of interchangeable lenses from extrawide angle to super telephoto plus, optional EOS-VL adapter allows mounting of over 65 Canon EOS 35mm Autofocus lenses.
- Includes wide range 15:1 zoom lens with special coating to cut flare and ghosts while providing high contrast and natural tonal gradation.
- Provides the stunning sound of AFM stereo with the choice of auto or manual level control.
- Records RC Time Code while shooting and can also "stripe" RC Time Code to tapes already recorded on other equipment. With RC Time Code, the L2 can be connected to an edit controller with RC Time Code capability for frame accurate editing.
- Advanced encoding function marks tapes for speedy identification and even find recordings by their date.

SONY

EVW-300

PROFESSIONAL Hi-8 3-CCD CAMCORDER

The EVW-300 is a complete one piece camcorder which includes a variety of innovative and advanced operational features. So, whether your shoots require basic recording capabilities or premier performance, the EVW-300 offers a wide range of features and remarkable recording quality to best suit your needs.

Features:
- Equipped with three high density 1/2" IT Hyper HAD image sensors. Has an excellent sensitivity of F8.0 at 2,000 lux, high S/N of 60 dB, and delivers over 700 lines of horizontal resolution.
- Provides high quality PCM digital stereo and single channel AFM Hi-Fi recording. Has XLR balanced audio connectors.
- Quick start 1.5" viewfinder with 550 lines of resolution plus Zebra pattern video level indicator and color bar generator
- Quick-start recording – takes only 0.5 seconds to go from REC PAUSE to REC MODE for immediate recording in the field
- Built-in 8mm Time Code generator records absolute addresses. (Either non-drop frame or drop frame mode may be selected.) Furthermore the EVW-300 incorporates a variety of time code features such as Time Code PRESET/RESET, REC RUN/FREE RUN and User Bits.
- A variety of automatic adjustment functions for different lighting conditions are incorporated into the EVW-300:
  ATW (Auto Trace White Balance) – when ATW is turned on optimum white balance is always ensured during recording, even for changes in color temperature. Conventional white balance adjustment is still provided with the Auto White Balance.
  AGC (Automatic Gain Control) – in addition to manual Gain Up AGC provides linear gain up in the range of 0 dB to 18 dB.
  Intelligent Auto Iris – for situations where the lighting between subject and background is different (subject is underexposed) the Intelligent Auto Iris automatically examines the scene and adjusts the lens iris for proper exposure.
- Selectable Gain-up from 1 dB to 18 dB in 1 dB steps for Mid & High positions.
- Clear Scan function – provides a variety of selection of shutter speeds ranging from 60-200 Hz allowing recording of almost any computer display without flicker.
- Compact, lightweight (12 lbs with NP-1B) ergonomic design provides well balanced and extremely comfortable operation.

BTS

Betacam SP-2000 PRO Series

PBC 2600 Player

- Superior picture quality to any other professional system.
- Brings virtual Betacam SP quality within the budgets of professional users.
- 90 minutes of playback using L-size Metal or Oxide cassettes.
- High-speed picture search provides recognizable color pictures at up to 10 times normal speed in forward and reverse (24 times normal speed in monochrome)
- Two longitudinal audio channels with Dolby C-type NR
- Equipped with RS-422 9-pin serial interface which is broadcast standard protocol.
- Built-in TBC with high quality digital dropout compensator
- Optional BVR-50 provides remote control of the TBC.
- Built-in LTC/VITC/User Bits reader, and character generator
- User friendly dial menu operation, enhanced serviceability with built-in self diagnostics
- Y/R - Y/B-Y component signal outputs via BNC or 12-pin Betacam DUB connectors. Also has S-Video output.
- Optional BKW-2020 provides U-matic DUB output capability.

PBC 2650 Player with Dynamic Tracking (DT)

Same as PBC-2600 plus–
- Dynamic Tracking (DT) provides broadcast quality noise-less playback within -1 to +3 times normal speed

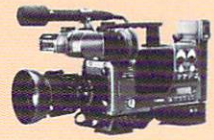
PBC 2800 Player/Recorder

Same as PBC-2600 plus–
- Built-in comprehensive editing facilities
- Dynamic Motion Control with memory provides slow motion editing capability (when used with a player VTR equipped with DT function)
- More than 90 minutes of recording/playback time using L-size Metal (for both recording and playback) or Oxide (for playback only) cassettes.
- Built-in LTC/VITC/User Bits generator and reader, also built-in character generator
- Y/R - Y/B-Y component signal inputs and outputs via BNC or 12-pin Betacam DUB connectors. Also has S-Video input and output.

TOSHIBA

TSC-200

3-CCD Hi-8 Camcorder



- Three 1/2" CCD chips mounted with spatial offset technology delivers superb resolution of 700 horizontal lines
- Low noise design provides extreme sensitivity of F8.0 at 2000 lux. Minimum illumination is 7.5 lux with excellent color reproduction
- New LNA (low noise amplifier) delivers a S/N (signal-to-noise) ratio of 62dB - the highest achieved for this type of camera
- 26-pin connector outputs Y/C or component video signal allowing hook up to a portable S-VHS, MII or Betacam recorder and simultaneously record with Hi-8.
- Quick-start 1.5" viewfinder needs no warm up time so you never miss a shot. Zebra pattern in the viewfinder alerts operator to excessive video levels.
- Linear matrix circuit employed to color mask the pure RGB signals output by the CCD so color reproduction is exceptionally faithful.
- Genlock capability allows synchronization with other cameras. Also full calibration functions are built-in as well as color bar generator.
- Variable high speed shutter from 1/60 to 1/2000 second
- Built-in 8mm time code generator records an absolute address to every frame. Provides precision editing of ±0 frame accuracy
- Has AFM audio channel separation characteristics for professional quality post-production.
- High-performance back electret condenser mic records to all three audio tracks. Low cut filter that eliminates wind noise.
- Sports very low power consumption. The TSC-200 draws only 16 watts per hour allowing 100 minutes of recording time with a single NP-1B battery.
- Camera body is made of magnesium alloy previously found only on broadcast cameras. Still, lightweight at only 13 pounds in standard configuration.

MICROPHONES

NADY

151 VR Wireless System

- Puts the microphone "where the action is" for professional quality audio on your tapes
- Operates on VHF High-Band Frequencies for interterence free performance. Two frequencies available.
- Nady's patented Companding Circuitry gives you crisp, clear sound without overload distortion or background hiss. Dynamic Range over 110 dB.
- Compatible with all camcorders and video cameras
- Range is 250 ft. Line-of-sight up to 1500 ft.
- Works with all camcorders having an audio input

151 VR/LT lavalier system **109.95**
151 VR/HT handheld system **129.95**

351 VR Wireless System

- The new 351 VR is compatible with virtually all camcorders and video cameras, and delivers sound that is every bit as good as the best hardwired mic.
- Ultra compact receiver – using new technology the receiver is no bigger than an audio cassette and connects instantly to any camera's external mic jack. Attaches either with shoe mount or belt clip both provided
- Both handheld and lavalier transmitters feature transmitter and audio ON/OFF switch, level trim and low battery LED
- Unparalled dynamic range of 120 dB to ensure a soundtrack with no background hiss or overload distortion.
- Available in four factory installed frequencies from 170-218 MHz allowing simultaneous operation of up to four mic systems in the same location.

351 VR/LT lavalier system **164.95**
351 VR/HT Handheld system **199.95**

SHURE

M267 Production Mixer

The industry standard M267 incorporates a switchable limiter, phantom power, LED peak indicator, built-in battery pack, headphone jack and level control, battery check function, tone oscillator, mic/line switches on each input and output, low cut switches, mix bus jack, and much more. Four XLR balanced inputs, an XLR output and a binding post output. AC or DC power, rack mountable **429.00**

SAMSON®

WE ARE THE WIRELESS FUTURE™

MR-1 Wireless System

- The MR-1 micro receiver is a professional VHF wireless receiver measuring less than 4" long and 2" wide.
- FCC licensed in 14 channels from 174 MHz to 213 MHz.
- Truly switchable balanced mic level (600 ohms) to unbalanced (-10 dBm) output.
- dbx noise reduction to simultaneously increase dynamic range and eliminate noise.
- Receiver squelch, level output & headphone level output controls.
- Headphone monitor output – lets you hear the sound you're getting before it goes into the camera.
- Removable flexible Rubber-Duckie antenna ensures perfect reception and easily handles those little bumps in the night.
- Can be powered by a 9V battery for 10 hours.
- SH-2 hand-held transmitter can be used with a variety of mic elements like Shure SM 58 dynamic mic or Audio Technica Pro 4.
- ST-2 (L) body pack transmitter can be used with leading lavalier microphones like Sony ECM-144 or Audio Technica 831.

Lavalier (clip mic) Systems

ST-2(L)ECM-144 Transmitter with Sony mic & MR-1 Receiver **329.95**
ST-2(L) ECM-44 Transmitter with Sony mic & MR-1 Receiver **379.95**
ST-2(L) AT 831 Transmitter with Audio Technica unidirectional mic & MR-1 Receiver **379.95**

Hand-Held Systems

SH-2/PR4 Audio Technica Dynamic mic element & MR-1 Receiver **349.95**
SH-2/58 Shure SM58 Dynamic mic element & MR-1 Receiver **399.95**
SH-2/85 Shure SM-85 condenser mic element & MR-1 Receiver **529 95**
SH-2/87 Shure SM-87 condenser mic element & MR-1 Receiver **529.95**

SONY

ECM-44B Omnidirectional Lavalier

- The ECM-44B makes the exceptional quality of Sony's electret condenser microphones easily available for budget conscious productions and a variety of sound reinforcement requirements such as lectures and demonstrations.

ECM-77B Omnidirectional Lavalier

- The ECM-77B is ideal for TV broadcasting and stage applications, where the highest quality inconspicuous microphone is required. Because of its extremely small size it not only enables unobstrusive miking but also minimizes glare. Even when hidden inside a costume its frequency response (40-20,000 Hz) is wide enough to pick up the voice with no perceptible change in quality. The ECM-77B also minimizes the pick-up of rustling noise.

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B&H PHOTO-VIDEO

TOASTER PERIPHERALS

I.DEN TBCard/II

- Broadcast quality infinite window time base correction and synchronization from any video source
- TBCard plugs directly into Amiga or IBM-PC
- Offers full 5.5 MHz bandwidth (440 lines of resolution) to ensure highest quality professional results
- Includes TR-7 remote control unit for full Proc Amp control, field or frame freeze, timing adjustments
- Features S-Video input and output **649.00**

I.DEN IVT-7

DIGITAL TBC/FRAME SYNCHRONIZER

- Will time base correct & transcode inputs from Hi-8, S-VHS, VHS-DUB, 3/4", 3/4" VCR-DUB and composite video
- Use as a frame synchronizer, synchronizing outside satellite, microwave and camera feeds with studio signals
- 3-5 dB chrominance and luminance noise reduction
- Full Proc amp controls, drop out compensator
- Y/C delay adjustments, field and frame freeze
- Wide 5.5 MHz frequency response offers 450 lines of resolution. Full 8-bit professing and a 58 dB S/N ratio
- Built-in RS-170 sync generator with genlock input and black burst output **1699.00**

The Kitchen Sync

Dual Channel TBC

- Two complete infinite window time base correctors on one IBM AT/Amiga compatible card
- Plugs into any Amiga or PC compatible
- Use more than one Kitchen Sync linked together to synchronize even more channels.
- S-VHS and Hi-8 compatible. Has S-video input with option for S-video out
- Complete 100% accurate sync generator built-in. Totally regenerates all sync and blanking signals.
- Absolute 100% broadcast quality output
- Built-in Proc amp with Hue, Saturation, Contrast and Brightness adjustments
- Complete digital design – no pot adjustments necessary. The Kitchen Sync is completely microprocessor controlled
- Advanced sync output – useful with any VCR capable of taking an Advanced Sync in. **1279.00**

RGB COMPUTER

AMILINK CIP

with Amilink VT-4000 Software

Amilink CIP is an Amiga-based A/B roll edit controller. It is a combination of hardware and software (VT-4000) that provides flawless control of three VCRs. It is also the most complete personal video editor for the Video Toaster. It controls low-cost industrial VCRs like the Panasonic AG-1960 and AG-1970 machines with RS-232 Control (AG-5700, CVD-1000 Vdeck), and machines with the Sony Control L Protocol like the Sony EVS-3000 and SLV-R1000. You can use three of the same or in any combination. Best of all, Amilink CIP is upgradeable for professional machine control. To upgrade, you buy an upgrade kit that includes new software and professional level control cards. The system includes a new version of Amilink software designed especially for the Toaster 4000. With the new Amilink VT-4000 software, the Video Toaster is seamlessly integrated into your editing suite.

Machine Control
- Choice of joystick, mouse, keyboard and trackball, plus an optional jog/shuttle editing keyboard
- Industry standard keyboard layout (CMX/GVG)
- Auto calculated GPI, plus 48 additional GPI triggers per edit with optional hardware
- Controls industry standard audio mixers

Edit List Management
- Sophisticated search list by edit comment, content or event number
- Import/Export of CMX 3600 edit list on MS-DOS and Amiga-DOS
- Automatic edit list back-up
- Edit tail cleaning, list rippling, multi-field sorting
- Optimized edit list auto assembly with special integration

Editing Control
- Preview, Perform, Review and Auto review functions
- Multi-set, Multi-trim
- Reverse play and auto review
- Pre-Roll, Post-Roll and Preview select

Edit Modes
- Provides for multiple audio/video splits per edit event
- Open ended immediate/delayed transition edits
- Performs all edit modes plus "Music Video Mode" for easily synchronizing edits to music.
- Integrate graphics, animation and character generation
- Scene-based editing with advanced park and perform features
- Cut and Paste EDL management

Toaster Control
- AmiLink/VT gives you total control over the Video Toaster as a fully integrated post-production switcher.
- AmiLink/VT remembers all of the Frame Stores, CG Titles, and DVEs used for your production in the AmiLink edit list. You never lose any of the information you need to recreate your production.
- All of the Video Toaster post-production functions are easily accessed from the AmiLink/VT interface screen. Toaster Digital Effects, Character Generator pages and the Digital Video Frame Stores, as well as standard wipes and dissolves, can all be called up automatically during edits, and are stored in the edit list for later auto-assembly.

SUNRIZE INDUSTRIES

AD 516 and Studio 16

The Complete Digital Audio Solution

The AD 516 is a professional quality 16-bit high fidelity sound board and hard disk recording system for the Amiga. It includes the feature packed Studio 16 software that allows you to perform all traditional audio post-production tasks. You can create sound effects, edit and replace dialog, and build multichannel soundtracks in the digital domain.
- Record, edit and playback directly off hard disk
- Play up to 8 simultaneous tracks off one or multiple hard disks in real time.
- Use a mouse to slice up and rearrange sound quickly
- Mix tracks with no generation loss
- Synchronize background music with your productions
- Fade, cross fade, or eliminate sections of audio
- Create unlimited variations of echoes, flanges, and choruses
- Optional Video Toaster Handler expansion module lets you play audio during many of the Toaster's digital video effects.

SANYO GVR-S950

S-VHS Single Frame Recording VCR

- Single-Frame Animation Controller eliminates the need for separate or computer plug-in animation controllers. Uses industry-standard protocols, making it compatible with most popular graphic and animation software packages.
- SMPTE Time Code Generator and Reader with Built-in Drop and Non-Drop Frame Read/Write is fully programmable from an external computer and resettable from the front panel.
- Video and Audio Switcher with Two independent Video and Audio Channels. Each video channel contains both composite and S-Video inputs. Each audio channel contains two linear and two Hi-Fi inputs Switching can be performed either manually, or under RS232 or RS422 control. Video and audio channels are switched independently giving the GVR-S950 the ability to perform break-away edits.
- Auto-Sensing Single RS422/RS232 Input eliminates the need for optional external interfaces. Interface requirements are automatically sensed and adjusted within the recorder.
- Input and Playback Video Processing allows adjustments to the video level of the incoming signal.

NEWTEK

VIDEO TOASTER 4000

The Video Toaster 4000 provides you with all the power and features that until now were limited to the networks and other "high priests" of video - because only they could afford it. But now the Video Toaster 4000 has changed the rules of video production and fundamentally altered its landscape forever. You can afford it, you can learn it, and you can't afford not to have it.

Production Switcher

The Video Toaster Switcher is a broadcast quality production switcher which lets you perform cuts, fades, dissolves, advanced digital effects, key and color effects between any of 7 sources including 4 video inputs, two true-color high resolution frame buffers and a background matte generator. A separate overlay channel gives you the ability to key images or live video over the switcher during transitions.

Additional Features:
- 2 video outputs (Program and Preview)
- Preview output lets you compose the next camera shot or frame buffer prior to performing the transition
- 256 level adjustable luminance key
- Automatic or manual (T-bar) control of transitions
- Animated wipe patterns such as page tearing, spray paint, windshield wiper, heart, clock, iris, spiral and many more
- Organic transitions such as clouds, spilling paint, pouring water, smoke, fire, shattering glass.

Luminance Keyer

The Video Toaster's integrated luminance key technology gives you the ability to superimpose a weatherman over a map, live video or still graphics. Luminance keying also works in conjunction with many Toaster Digital Effects to make text or logos fly in over another video source. Text created in ToasterCG uses built-in automatic keying to deliver titles crisply rendered over any video source, even with transparent drop shadows.

Frame Grabber/Frame Store

The Toaster can grab and save a full frame (in 16.8 million colors) and has sophisticated motion removal algorithms to provide a rock-solid freeze frame. These frames may then be loaded into "ToasterPaint" or "LightWave 3D" for further manipulation. Up to 1000 frames may be saved on each frame store device (depending on available storage space). Stored frames can be loaded and displayed in the frame buffers in as short as 1/5 of a second from RAM or 3 seconds from hard drive. These frames can also be used as inputs to the switcher for transitions and digital effects.

ChromaFX Color Processor

ChromaFX is a sophisticated real-time color processor that gives you complete control of all aspects of the brightness, contrast and color of your video. It can alter video with color negatives, day for night, sepia tone, monochrome, solarization, posterization, color vignettes, and other totally unique effects such as Nuke, Chrome, Gold, Zebra, and more. ChromaFX also gives you the power to create your own custom color effects from subtle lighting changes or tints to blazing psychedelic effects that will wake up your audience.

Digital Video Effects

The Toaster has the processing power to manipulate live broadcast video in real time, and perform hundreds of network-quality digital video effects as easily as clicking the mouse and sliding the T-Bar. There are effects for wedddings, birthdays, sales, music videos, public affair messages, etc. There are even sound effects. Among the effects which are included with the Video Toaster are:

Page Peel	Tumble	Zoom	Cube Mapping
Fire	Smoke	Pour	Sphere Mapping
Push Off	Push On	Slats	Trajectories
Slide	Shatter	Puzzle	Analog Trails
Dissolve	Mirrors	Mosaic Tiles	Digital Trails

Character Generator

ToasterCG creates YIQ-encoded, 35ns (nanoseconds) high-resolution titles. ToasterCG makes adding text to your presentations simple. Among the many powerful tools included are:
- Giant library of more than 250 PostScript fonts
- Can size fonts from 10 lines to 400 lines tall
- Variable outline and shadows
- Variable-speed crawling and scrolling of text
- Easily adjust color, shadow type, outline style and font selection on a line, word, or character-by-character basis

ToasterPaint

Everything you need to create or alter true-color images tailor-made for your presentations is included in an uncluttered friendly interface. ToasterPaint makes importing and modifying files from the CG and frame grabber easy. It also gives you the capability to merge images captured in the Toaster's high quality digital still store or retouch those images with incredible realism.

Dual Frame Buffers/Genlock

These are 24 bit (16.8 million colors) frame buffers with composite output that meets the most stringent requirements for broadcast video. Because there are two frame buffers, one can be loading while the other is shown on screen for seamless live presentations. Toaster effects can be done between live video and either buffer, as well as between the buffers themselves.

Lightwave 3D

The Ultimate 3D Rendering and Animation System for Broadcast Graphics

LightWave 3D offers all the high-end features you need to produce true network-quality graphics. Model, render, and animate videos in full broadcast resolution and 16.8 million colors. Everything from flying logos, scientific visualization and the most sophisticated effects seen on broadcast television are now on your desktop.

DIGITAL

PROCESSING SYSTEMS INC.

DPS DC-2350

Personal Component Adapter

- The Personal Component Adapter is a combination 3-Line Adaptive Digital Comb Filter Decoder and Y/C encoder designed for use with the Video Toaster.
- Equipped with three S-Video inputs which are converted to Video Toaster input feeds. This allows devices such as TBCs and VCRs with s-video output to be connected directly to the Video Toaster.
- Has two S-Video outputs plus switchable Betacam/MII component output which allows the Video Toaster to be connected to Y/C monitors, S-VHS, Hi8, Betacam and MII recorders.
- Its 3-line Adaptive Digital Comb Filter provides superior diagonal luminance resolution compared to products using two-line comb filter designs.

DPS VM-2000

Personal V-Scope

The DPS Personal V-Scope is the world's first Waveform Monitor and VectorScope for desktop video. It is designed to give your system the power, look and flexibility of broadcast quality hardware, but at a software price.

Features:
- The Personal V-Scope produces a digitally synthesized Waveform Monitor and VectorScope display which can be superimposed onto any video signal.
- A Plug-in card with control software it works in both Amiga and IBM PC compatibles.
- Any NTSC video signal can be input into the V-Scope which provides a buffered video output, a superimpose (software controlled) video output, and a full-time Waveform/Vector Video output.

DPS VT-2600

Personal TBC IV

The Personal TBC IV is the latest in a series of innovative desktop video products from the company that invented the Personal TBC.

Features:
- Component digital transcoding provides s-video input and output. Digital 4:2:2 processing ensures the cleanest possible picture. Composite video signal is also enhanced by a newly developed chrominance comb filter.
- It interfaces virtually any camcorder, VCR or laser disk player to production switchers or computer video systems like the Video Toaster.
- Special features include Rock Solid Freeze (both field and frame), GPI Freeze, Variable Strobe, Forced Monochrome and Advanced Sync.
- Film Effect Strobe Mode - This feature simulates the 3-2 pull down conversion technique from a 24 frame per second film standard, to a 30 frame per second video standard.
- Can be installed in any Amiga 2000/3000/4000 series or in IBM PC-compatible computers. Includes Amiga and MS-DOS control software.
- Exclusive feature of the TBC IV is the 50-pin CVE (Component Video Exchange) port. When this port is connected to a DPS Personal Animation Recorder you can capture and record real-time video on the animator's dedicated hard drive. This combination is ideal for roto-scoping and other video capture processes.
- Fully compatible with TBC II, III and Personal V-scope. The TBC IV is operated via software, or by using an optional DPS RC-2000 multi-channel desktop controller.

DPS DR-2150

Personal Animation Recorder

The DPS DR-2150 Personal Animation Recorder is designed to record computer animation sequences directly to a hard drive and then play them back in real time. The DR-2150 is a card that plugs directly into an Amiga expansion slot and replaces both the single frame record VCR and the single frame controller.
Bad edits, missed frames, tape dropouts and other mechanical glitches common to traditional VCRs are a thing of the past with the Personal Animation Recorder.

Features:
- Combines custom ICs and a proprietary implementation of the LSI chip set enabling component 4:2:2 digital recorcing to a dedicated hard drive.
- Variable speed playback lets you play back 24-bit (16.7 million colors) animation in real-time 30 frames per second, or you can choose a lower frame rate to play back animations in slow motion.
- Has composite, S-Video and component (Betacam/M II) outputs. Also includes a genlock input which enables it to be easily integrated with virtually any video production system.
- Supports direct rendering of all common image formats including 24-bit IFF and Video Toaster frame store files and is fully compatible with all popular animation packages including Morph Plus, Lightwave 3-D, Fractle Pro, Imagine, Vista Pro, and Cinemorph.
- Real-time video capture for roto-scoping and other video capture applications is possible when the Personal Animation Recorder is used in combination with a DPS TBC IV card.
- Currently system requires a Seagate ST-3600A 540 MB IDE drive. The ST-3600 A provides the consistent data transfer at the rate required by the Personal Animation Recorder. Recording times vary depending on image complexity but four to five minutes of high quality playback is typical for the drive

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REVIEW

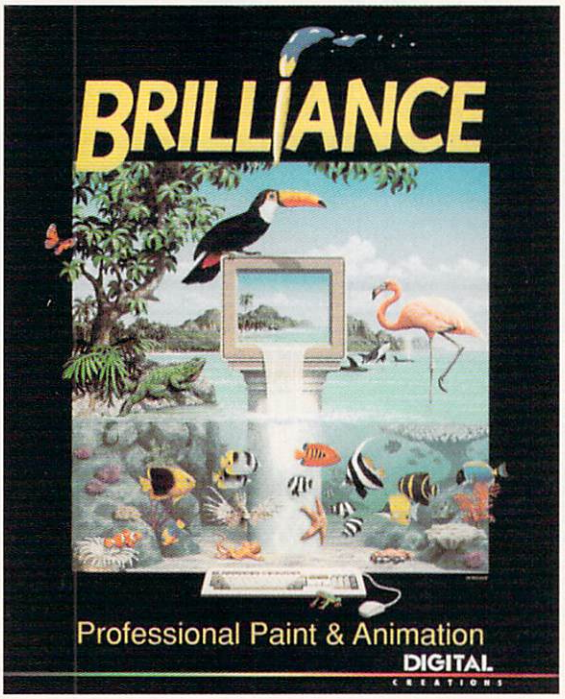
Brilliance

A Powerful, New Paint Solution for the ToasterPaint Blues

By Maury McCoy

Since the invention of the Video Toaster, many Amiga artists have found the DeluxePaint/ToasterPaint combo to be at the core of many of their creative endeavors. With the recent introduction of Brilliance ($249) from Digital Creations, Toaster owners have a new alternative for creating stunning images on their Amigas.

Digital Creations boasts that Brilliance will become the new standard in Amiga paint and animation. Offering true 24-bit paint capabilities and a long list of features, this program looks to supply Toaster users with the ease of use they have grown accustomed to in DeluxePaint and the powerful palette of the Toaster.



Installation

Brilliance requires an Amiga with at least 2 MB of RAM, although 4 MB are recommended. As with most paint programs, more is better when it comes to RAM; Brilliance is certainly no exception. The program also requires two floppy drives, or a hard drive and one floppy, which is no problem for Toaster owners.

Installing the program on my hard drive was a relatively straightforward process. Since Brilliance is copy-protected, a 24-digit security code must be entered during installation. A dongle, a small security key, is included with the program; it must be plugged into the game port of the Amiga any time the program is run.

I can't blame Digital Creations for wanting to protect its interests but perhaps the company's method should be questioned. Dongles are a hassle and have been eliminated from most professional programs over the last few years. This dongle poses a special problem for Toaster owners because the Toaster uses the Amiga's game port for receiving GPI triggers from external devices. Digital Creations warns against plugging in the security key with the computer on, so the machine must be turned off every time the user wants to switch from using GPI triggers to running Brilliance. Worse still is the fact that with a GPI trigger cable plugged in, the dongle is susceptible to getting lost. This is particularly dangerous for artists who believe a cluttered desk is the sign of a creative mind.

Digital Creations is aware of this problem and is planning to release a professional version of Brilliance with a dongle that would possibly use the last disk drive connector as opposed to the game port.

Brilliance is the register-based version of the program that allows users to paint in 2, 4, 8, 16, 32, or 64 EHB colors and also 128 or 256 colors on AGA-equipped Amigas. Its more colorful counterpart, TrueBrilliance, allows true 24-bit painting by providing a HAM representation of screens while maintaining the true fidelity of the image internally.

On newer machines equipped with the AGA chip set, it is possible to view full-screen HAM8 representations of images. On older Amigas, only a quarter-screen HAM6 representation of the image is possible.

Interface

The interface for both programs is in low resolution and nearly identical except for differences in a few of the menus. One of the first things I noticed about this program was that it doesn't use pull-down menus like DeluxePaint and ToasterPaint. Rather, Brilliance uses a unique, configurable menu system that allows different horizontal menus to be stacked on top of each other.

The entire menu system is removed by pressing the spacebar or by clicking with the middle mouse button for owners of a three-button mouse. DeluxePaint owners will find almost all of their favorite tools here, including freehand drawing tools, rectangles, ellipses and many of the same brush operations.

Keyboard shortcuts for Brilliance are nearly identical to those of DeluxePaint. Digital Creations has wisely decided to maintain a lot of the standard conventions it has developed through the years.

Brilliance also has taken many features from DeluxePaint and improved upon them. One of my favorites is the inclusion of a Bezier curve tool that allows the creation of complex curves through the interactive movement of four control points. Another powerful addition is the option of a segmented magnify mode that bounds magnified pixels with a black border. The addition of these two features is especially useful for artists doing logo touch-ups, a task that is difficult in non-register based programs, such as ToasterPaint.

While many of DeluxePaint's tools have been improved upon, I found some of Brilliance's tools difficult to use. The text tool in particular was somewhat irritating. For starters, the program wouldn't let me reassign the font directory from within the requester. If I wanted to load a font from disk for example, I would be forced to open a shell from Workbench and manually reassign the font directory. Another minor complaint I had was that the program loads text as brushes. Although this works, I prefer to be able to type text directly on the screen rather than having to go through a load

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requester every time I need to type a few letters. I liked that the text tool allowed for the loading of Compugraphic fonts in user-definable sizes.

Features

Right from the start of the program, I noticed that Brilliance had blazing speed. The feel of the program was very good, even in HAM8 mode on a 640-by-400 screen. Brilliance blows away the competition in this category.

Along with speed, the people at Digital Creations must be under the impression that more is better.

The program offers multiple brushes and anim brushes (up to eight total), multiple pages and animations, and even allows for multiple undo and redo—a feature many artists will take an instant liking to. The multiple brush system is unique because when you store a brush in one of the eight provided brush wells, you get to see a small representation of it.

This program also supports antialiasing, which works magnificently. Unlike some programs that merely outline an image in an intermediate color or blur the edge, Brilliance does antialiasing with extremely smooth-looking results.

In the color department, the palette menu allows the selection of colors through the RGB, HSV, or CMY color systems, and up to eight gradient ranges are allowed. Stencil support is also present and very easy to use.

Brilliance offers a variety of ways to choose the colors that will be masked and provides a special draw stencil mode; this is useful when trying to create stencils for 24-bit images.

Stencils also can be saved and loaded. Anyone who has ever drawn a circle and rotated it 90 degrees has quickly discovered that Amiga pixels are not square. By using this feature, the computer compensates for this fact when it calculates rotation, producing final images that look correct.

Animation

Overall, I was pleased with Brilliance's animation capabilities. The main animation menu is a joy to use with a drag bar that lets you scroll through frames of an animation while viewing them. The set number and add number of frames also make much more sense in this program than in DeluxePaint.

Anim painting is supported by hitting the Alt key and painting on-screen. To ensure close to real-time feedback in the more complex HAM modes, images aren't stamped down as you draw; rather, the computer remembers the mouse location and returns to stamp the brush after you release the mouse button.

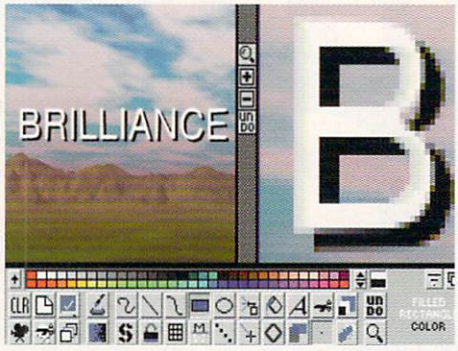
The tweening menu is also powerful. Artists accustomed to using the move requester in DeluxePaint will find themselves confronted with the familiar positioning and rotation input boxes. The tweening menu goes many steps beyond DeluxePaint by adding numerous new features, such as the ability to control the opacity of objects over the course of an animation, trails with variable decay, aspect-corrected rotations, as well as interactive positioning of start and end frames.

Brilliance also has the ability to adjust the focal length of the camera lens in its perspective mode, giving the user more control over the final look of an animation.

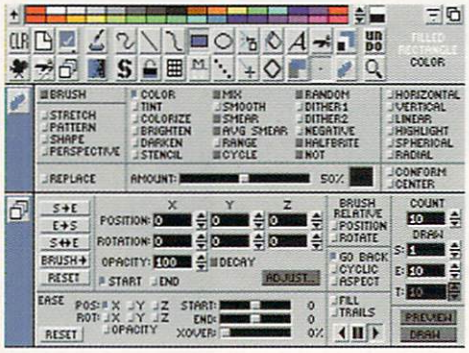
Anim-brushes also are supported and can be created by morphing two separate brushes into each other. Brilliance also uses the latest Op-8 animation format to ensure speedy playback of completed animations.

The Downside

For Toaster users who wish to use the genlock utility to key animations over live video or Toaster framebuffers, a few notes are worth mentioning. For starters, Brilliance considers its video mode to be 736 by 482, about 16 pixels short of the Toaster's video resolution. Animating on a custom 752-by-480 screen is not allowed. This means that graphics get cut off about 16 pixels shy of the right-hand border.



HAM8 display showing magnification and antialiasing.



Stackable menu system with main menu, draw mode menu, and tweening menu shown.

The cutoff happens in the overscan area and should not be a problem for most applications. It would be nice if Brilliance would conform to the Toaster's video resolution rather than forcing the user to set a custom page size every time a Toaster image needs editing.

There also is a problem using the play-once feature for Brilliance animations. The animation pauses on the second-to-last frame of an animation while at the same time, the cursor flashes into its wait symbol. This problem can be solved somewhat by appending a number of identical frames to the end of the animation, delaying the jump and the flashing wait symbol. The situation creates an awkward fix that Digital Creations is trying to correct.

Toaster Euphoria

Positioning text and graphics on a full screen without scrolling is pure ecstasy. Add to this the fact that Brilliance has many more tools, much faster feedback and images are represented in more colors (262,144 out of 16 million as opposed to 4,096 colors for ToasterPaint) and it doesn't take users long to start wondering how much hard drive space could be freed by eliminating a certain scrolling paint program.

Unfortunately, there are a couple of features that ToasterPaint has that were not incorporated into Brilliance. Brilliance lacks any type of transparency falloff requester or the powerful Redo option offered by ToasterPaint.

Brilliance has a nice airbrush tool, but it offers nowhere near the power or control offered by the transparency menu in ToasterPaint. Brilliance also lacks the ability to cut out polygon-shaped brushes. The program provides a way to cut out brushes freehand, but my mouse tends to get a mind of its own when cutting out especially large brushes. Brilliance also has no way to directly load framestores or to output images directly to the Toaster framebuffer; Digital Creations said it is looking into the possibility of supporting those options in the future.

Gripes

Besides the dongle, my major complaint is with the Brilliance manual. This program is extremely powerful but does little to help pass along the knowledge needed to harness that power. Explanations of tools are brief and at times ambiguous leaving the user to experiment on his own to find out how a tool works.

A few good tutorials are included, but there needs to be more. No mention is made in the manual about the ability to auto scroll around the screen other than the fact that "auto scrolling is not allowed in Video Overscan mode." This feature is especially important for pre-AGA machine owners who wish to edit Toaster images and should be covered in more detail.

The ability to set the Undo buffer also is provided by the program, but the manual gives the user no explanation of what values to use. I would also like to see more technical appendices, perhaps on such things as Amiga display modes and an explanation of color ramping in HAM.

An appendix on how to use Brilliance in conjunction with the Toaster also would help to support the claim that the program is intended for professional paint and animation. Brilliance has taken many steps beyond DeluxePaint, but in the

manual department it has taken a few steps backwards.

Users who want to get the most out of Brilliance and don't have a strong background in DeluxePaint might be wise to get their hands on a DeluxePaint manual and check out some of the tutorials and other functions. For example, out of habit I pressed Shift while in Brilliance to lock the axis upon which I could move my brush. This function worked just as it had in DeluxePaint, yet when consulting the Brilliance manual, I found no reference to this valuable feature.

Another example is the ability to use the segment tool along with a drawing tool and anim painting to have brushes follow a designated path over the course of an animation. This feature is supported, but without a tutorial, I doubt many users would figure it out. Digital Creations does have a help line that questioning users can call during the workweek, as well as a 24-hour bulletin board service (BBS) for support.

The Final Analysis

Is Brilliance the new standard in paint and animation on the Amiga? In the area of 24-bit painting, I would have to answer with an emphatic yes. Amiga 4000 owners, who have been yearning for a painting alternative that takes advantage of their powerful machine, finally have one. If only there were more Toaster support for this program, Toaster users might never again be forced to click on the ToasterPaint crouton.

For pre-AGA machines, Brilliance also offers a lot of features not currently found in ToasterPaint, and the two in combination offer users many more options for creating images on the Amiga. As a die-hard DeluxePaint user for the past seven years, I would hesitate to say that Brilliance is going to replace it as my favorite register-based paint program. On the other hand, after feeling the increased speed of Brilliance and getting accustomed to some of its features, (I just love those Bezier curves) it makes it a little hard to go back.

With an improved Text requester and a few other improvements, I can see that Brilliance would become my number-one paint program for touching up logos and doing register-based animation. But at its low list price, Brilliance is worth adding to any professional artist's toolbox.

VTU

Maury McCoy was the original designer of objects included with LightWave 3D. He currently specializes in 3D and cell animation at Snitily Video Productions in Lincoln, Neb.

Company Mentioned:

Digital Creations
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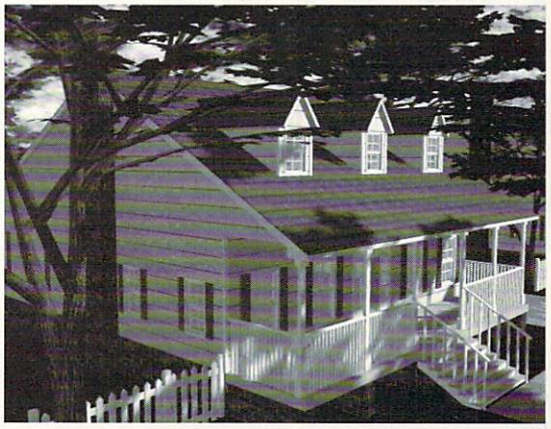

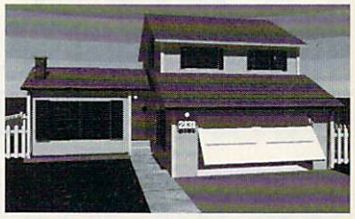

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REVIEW

Sony's UVW Betacam

Affordable Component Video for the Personal Producer

By Tim Doherty

Clear boundaries once defined video production. The more you spent for a videotape machine, the better the video quality you could expect it to deliver.

However, the revolution NewTek launched a few years ago has turned the world upside down by making high-tech, sophisticated equipment available at an inexpensive price. Suddenly, the lines of demarcation between consumer, industrial and professional, video equipment—and users—are a blur.

What once was a neat and tidy video world defined pretty much along the lines of videotape formats—VHS for consumers, 3/4U and S-VHS for industrial video users and Betacam and one-inch Type C for professionals—has turned into a jumble of price, performance, and end-user expectations that seem to change weekly.

New terms, such as *prosumer*, were invented to describe an emerging market where new expectations about price and the quality of a format were the rule. Prices on all types of equipment began spiraling downward. Today, with the revolution in personal video production well underway, a small production company can equip itself in a way that budget-minded businesses could only have dreamed of in the pre-Toaster era.

Sony's new UVW line of Beta SP VTRs is a case in point. Betacam SP quality is now within the reach of companies that can afford industrial S-VHS systems. Indeed, the UVW Beta SPs are sure to shake up the world of industrial video production.

UVW-1800

UVW-1600

UVW-1600 and UVW-1800 Features

Video (UVW-1600 & -1800)
Luminance: 30Hz to 4.0MHz
Color difference: 30Hz to 1.5MHz
Signal to noise:
Luminance: >49dB
Chrominance: >52dB

Video In (UVW-1600)
Composite

Video In (UVW-1800)
Component 12-pin
Component BNC
Composite BNC
S-Video four-pin

Video Outputs (UVW-1600 & -1800)
Component 12-pin
Component BNC
Composite BNC (two)
S-Video four-pin

Built-in TBCs (UVW-1600 & -1800)

Time Code Reader (UVW-1600)

Time Code Generator/Reader (UVW-1800

Audio (UVW-1600 & -1800)
Two longitudinal tracks
Dolby C-type noise reduction
Frequency response: 50Hz to 12.5kHz
S/N ratio at 3 percent distortion level: 70dB

Shuttle Speed (UVW-1600 & -1800)
5x play speed in color
16x play speed in black and white

Videotape
Recommended: metal particle
Small cassette:
11-, 21-, and 31-minute lengths
Large cassette:
64- and 94-minute lengths

Options
Remote Jog/Shuttle control $300
TBC controller $950

Betacam SP

Because of its excellent video quality, the ability to record multi-generations with minimal picture degradation and relative portability, Betacam SP has become the format of choice for broadcast and post-production companies around the world.

Betacam SP uses a component recording scheme in which the analog signal carrying brightness information (Y) is recorded separately from the two analog color components (R-Y, B-Y—that is red minus luminance and blue minus luminance). As a result, Betacam SP reproduces pictures with detailed chrominance and luminance information that has been broadly embraced by the industry. Resolution, signal-to-noise ratio, and bandwidth are virtually the same as a much larger, more expensive, one-inch Type C VTR.

This recording scheme also results in superb multi-generational picture performance. Betacam SP can withstand five generations with little image degradation. The implications for the editor are obvious. For instance, you can separate an acquisition tape to create a B-roll reel, then edit both of these to a master with no apparent quality loss. This master can be submastered even further. Betacam's impressive multi-generational capabilities have also contributed to its popularity among professionals. Note, however, that the ability to withstand numerous generations diminishes when you move out of component format into S-video and diminishes even further when you move to composite. (If you are considering a Toaster/UVW editing system, you will want to invest in a Y/C card to maximize the Toaster's input/output.)

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Betacam Historic Milestones

BVW-1
Year of Introduction: 1987
Product Description: One-piece Betacam camcorder
Price: -unavailable
Photo: -unavailable

BVW-70
Year of Introduction: 1987
Product Description: BetacamSP edit recorder
Price: $40,540

BVW-D75
Year of Introduction: 1987
Product Description: BetacamSP edit recorder with D-1 serial interface
Price: $37,070

BVW-35
Year of Introduction: 1988
Product Description: Portable BetacamSP recorder/player & feeder
Price: Approx. $20,000

BVW-40
Year of Introduction: 1984
Product Description: Betacam studio edit recorder
Price: Approx. $50,000

BVW-75
Year of Introduction: 1987
Product Description: BetacamSP edit recorder with Dynamic Tracking
Price: $45,750

BVW-65
Year of Introduction: 1987
Product Description: BetacamSP edit player with Dynamic Tracking
Price: $34,170

BVW-50
Year of Introduction: 1988
Product Description: BetacamSP portable deck
Price: $17,960

Chrissy Borgatta

Rear view of the UVW-1600 feeder/player.

Chrissy Borgatta

Rear view of the UVW-1800 edit recorder.

below its established high-end BVW line, the PVWs (or Beta Lights, as they have come to be known) made Betacam available to many video producers in the professional and industrial video markets for the first time.

The new UVWs promise to introduce Betacam to an even wider range of users. There are four decks in the UVW line: the UVW-1800 editing recorder ($9,450 list), the UVW-1600 feeder/player ($7,980), the UVW-1400 recorder ($7,280) and the UVW-1200 player ($5,320). Sony says the list pricing of the UVW-1400 and UVW-1200 are "tentative." The company also is selling the UVW-327PAC camera/recorder package ($12,560).

For this review, I will look at the UVW-1600 feeder/player and the UVW-1800 editing recorder in A/B-roll editing and single-frame animation recording applications.

The UVWs: A First Look

As I unboxed the UVW VTRs and set them up, my immediate impression was that they looked clean and modern. However, I quickly realized the reason they looked so sleek: There are few controls. By keeping features to a minimum, Sony was able to hold the base price low. Each machine has the standard VTR buttons to play, rewind, fast forward and eject the tape. Naturally, the 1800 also has a record button.

Conspicuously absent from both units is a jog shuttle dial. The UVWs are designed as components of an editing system, in which the tape transport is handled through the edit controller. Because a jog/shuttle dial is not a necessity in such a system, it has not been incorporated into either machine. An optional jog/shuttle remote control unit, the SVRM-100, is available for an additional $300.

Time code generator/readers and time base correctors are built into both decks, but also noticeably missing are TBC controls (aside from subcarrier system adjustments). More extensive control of TBC functions is optional. The BVR-50 TBC remote controller lists for $925.

Audio levels and time code information are displayed on easy-to-read front panel LEDs. A flimsy flip-down door on both units reveals small buttons for menu selections. Though they look nice, the tiny buttons are not practical. Next to the buttons are switches for remote or local operation, time counter display mode and super output on/off. Knobs for adjusting audio levels are located to the left of the switches on the 1800 only.

BVW-50
Year of Introduction: 1988
Product Description: Portable BetacamSP field recorder
Price: $17,960

BVW-300A
Year of Introduction: 1988
Product Description: One-piece BetacamSP camcorder
Price: $42,000

PVW-2600
Year of Introduction: 1990-91
Product Description: BetacamSP video edit player
Price: $11,925

PVW-2800
Year of Introduction: 1990-91
Product Description: BetacamSP video edit recorder
Price: $17,885

DVW-500
Year of Introduction: 1993
Product Description: Digital component recorder/player
Price: $46,000

DVW-A510
Year of Introduction: 1993
Product Description: Digital component player with analog and digital playback.
Price: $40,000

DVW-A500
Year of Introduction: 1993
Product Description: Digital component recorder/player with analog and digital playback.
Price: $54,000

UVW-1600
Year of Introduction: 1993
Product Description: BetacamSP feeder/player
Price: $7,980

UVW-1800
Year of Introduction: 1993
Product Description: BetacamSP edit recorder
Price: $9,450

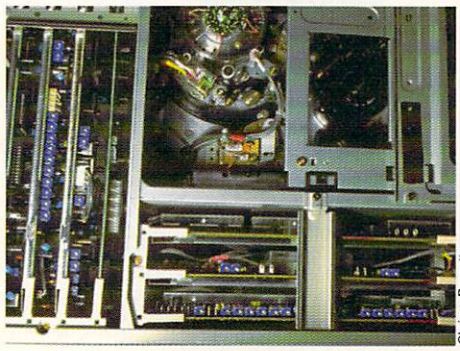
In addition to headphone jacks, both units also have a front panel Control S jack. This means that the UVWs can be connected to other industrial (and even consumer) Sony decks that support its Control S standard. This indicates that Sony is positioning the UVWs to be incorporated into many low-end systems.

The following inputs and outputs, which are standard, are located on the rear of the 1800: component 12-pin, component BNCs, composite BNC, S-video four-pin, audio channels one and two and time code. The 1600 has corresponding outputs only. Both VTRs also feature a super video output, which superimposes character information on the video signal, and sync inputs, an RS-422 plug and a remote TBC plug.

A peek inside the case of the 1800 revealed it to be well-designed and very serviceable. Major components were on cards, which can be pulled for easy repair or replacement. There did not appear to be an on-board automatic cleaning function. By contrast, the more expensive BVW recorder has a cleaning roller that automatically passes over the heads.

Easy Editing

Setting up the units was a snap because they support the standard Sony RS-422 protocol. It was a simple matter of plugging them in, setting a few menu options and loading an edit list. The menus were easy to navigate with arrows that prompted me for options (as opposed to the hierarchical structure of most VTR menu systems). The clarity of the large LED display contributed to the easy menu selection. The LEDs also featured helpful prompts when necessary. For example, when I tried to record without feeding sync to the system, the display immediately showed, "NO SYNC!"



Chrissy Borgatta

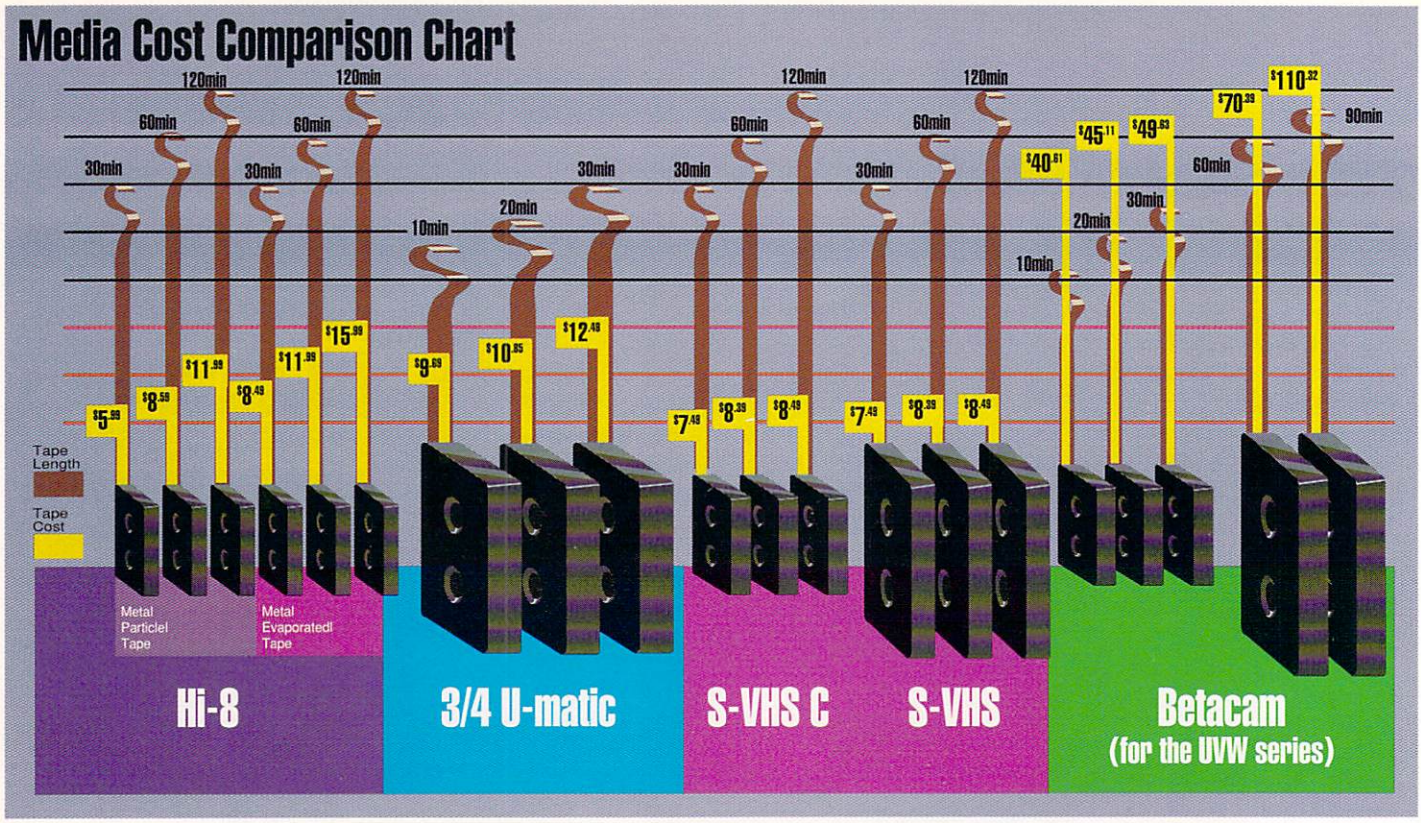
The UVW-1800's major components are on cards which can be pulled for replacement or repair.

I tested the units in a variety of configurations: off-line editing using a PC-based Ensemble Pro as an editor and the Video Toaster as a switcher; on-line, using a CMX 3600 as an editor and the Toaster as a switcher; and single-frame animation recording using a personal single frame controller.

While the UVWs performed flawlessly in each configuration, they were more functional in the smaller off-line system than the big on-line setup. For instance, horizontal and subcarrier phasing didn't have as good a range as that of the BVW series, and I could not get an exact match. This suggests that the UVWs are meant for smaller systems where phase delays aren't as critical.

The audio and video channels also blank during fast-forward and rewind. To retain the picture and enter search mode, users must hold down the FF or REW button. This is not practical in a large editing environment in which the decks are out of reach or perhaps not even in the same room.

In all cases, editing was flawless. The units integrated into the systems without a glitch, accepting the edit lists easily. I was able to insert video, audio channel 1, audio channel 2 and



Those considering the UVW series for their production needs should be cognizant of media costs. Compare the average list price per minute of videotape for the UVW of $1.50 with that of S-VHS and S-VHS C. (12¢ per minute), 3/4 U-matic (55¢ per minute), and Hi-8 (18¢ for metal evaporated tape and 13¢ for metal particle tape). Average prices are based on advertised prices for S-VHS, 3/4 U-matic and Hi-8. UVW average prices are based on Sony's recommended list price for the UVWT series of videotape.

time code independently. The transport mechanism proved to be outstanding and supported search speeds from five to 16 times normal. The decks were quiet and seemed to be fast, sturdy and reliable. Pre-roll was very short. I was able to record single-frame animations to tape with a pre-roll of only two seconds.

The image quality was excellent on first as well as multi-generation copies. Although Sony's specification sheet reveals that the UVWs are slightly inferior to their bigger brothers, I saw no visible difference between the UVW, PVW and BVW decks. Luminance signal to noise ratio is more than 49dB, and chrominance signal to noise is more than 52dB. This is 1dB to 2dB lower than that of the PVWs. Luminance bandwidth of the UVW is 30Hz to 4.0MHz. On the PVW series, luminance bandwidth is 30Hz to 4.5MHz. UVW chrominance bandwidth is 30Hz to 1.5MHz (+1, -4.0), while on the PVW it is 30Hz to 4.5MHz (+0.5, -3.0). I tested the UVWs with tapes containing noticeable dropouts, which they handled well. Audio edits were cleaner than those of KOCE-TV's one-inch machines. Audio specs for the UVW line are not quite as high as for the more-expensive Betacam units. Still, they are very good. Frequency response is 50Hz to 15kHz. Signal to noise (3 percent distortion) is 72dB or greater; distortion (THD) is 1 percent or less, and wow and flutter is 0.1 percent RMS or less.

Chrissy Borgatta

The UVW-1600 and -1800 are compact and fit easily on a desktop setup.

Weighing the Choices

Most people will find the lack of TBC control on the UVW series to be a major drawback—like buying a car without a steering wheel—thereby adding another $925 to the price tag. Designing this as an option seems to be a ploy to keep the base list price down, since the TBC control really is necessary for most editing situations.

Many users also will find it cumbersome to work without a jog/shuttle dial, as I did when doing animation. This tacks on an extra $300. But even with these additions, Betacam SP is affordable as it never has been before.

However, there is one other important point to consider: tape stock. Beta tapes cost three times as much as S-VHS tapes. A producer setting up a system to off-line a documentary series might think twice about the relative cost when hundreds of videotapes are factored in. Sony recommends that its UVWT metal particle tape, available in small cassette size (11, 21 and 31 minutes) and large size (64 and 94 minutes) be used.

Still, for most users, the striking quality of Betacam SP will be worth the extra cost of both the hardware and the media. Most video producers I know who don't use Betacam wish they did, but in the past found it to be too costly. That now is changing.

With its superb picture quality and relatively low price, the UVW line is sure to make a big impact on the industrial video market and may well set the new low-end standard.

VTU

Tim Doherty is a professional LightWave animator and is currently working on a PBS series on astronomy, produced by KOCE-TV, Huntington Beach, Calif.

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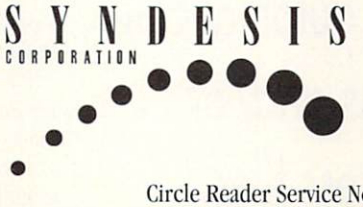

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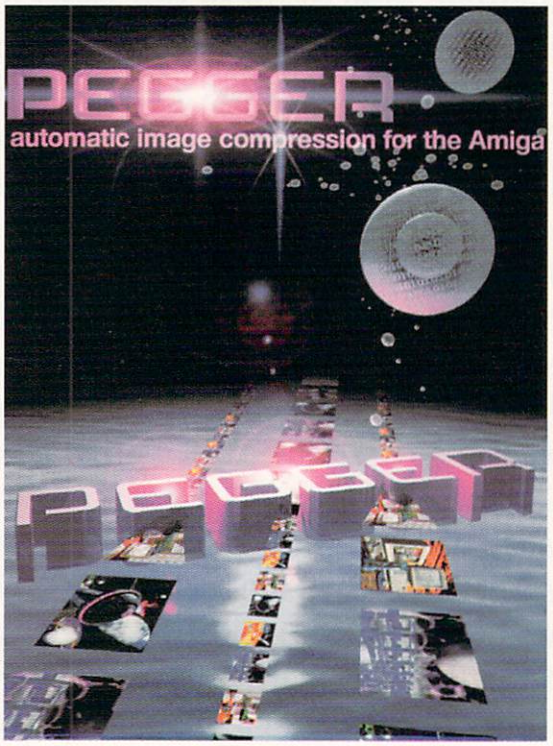
REVIEW

Pegger
An Affordable JPEG Compressor

By Douglas J. Nakakihara

Pegger ($99.95) from Heifner Communications allows you to seamlessly use JPEG images with the Video Toaster and other Amiga programs. Imagine saving 15 or more framestores on a single low-density floppy disk!

Even if you already use ASDG's ADPro or GVP's ImageFX, Pegger provides a much easier way to tap into the significant benefits of JPEG. By transparently processing JPEG files, you essentially skip the conversion step required by those image processing programs. Additionally, Pegger has much lower RAM requirements and is the only practical way to use JPEG files for image maps with 3D programs.



"In the Snoop window, you identify directories and subdirectories that you want Pegger to monitor and automatically compress and/or decompress files."

JPEG

JPEG is an acronym for the Joint Photographic Expert Group, a working group sponsored by the International Standards Organization that put together the JPEG compression standard. JPEG is a compression method in which some information is lost when a file is compressed. However, the loss may not even result in a detectable difference in image quality. Things like LZ and LHArc use a lossless compression scheme, where the original can be reproduced exactly from a compressed file.

The amount of JPEG compression is adjustable with a trade-off between file size and image quality. Using the default 85 percent JPEG setting, files are about 8 percent of their original size.

The Interface

When Pegger is running, there are three tasks available to the user: CJPEG, DJPEG and Snoop. By default, an AppIcon and Workbench menu item will appear for each task, enabling the user to bring up the appropriate setup window quickly. Windows also can open on their own custom screen or the active public screen. However, the windows do not have to be open for processing to take place.

CJPEG and DJPEG are the compression and decompression tasks, respectively, and have very similar windows. They basically provide a means to process files using an efficient point-and-click interface. In the batch mode, all of the files in a directory can be selected as well as files in any subdirectories. Pattern matching is supported and multiple files can be selected using an ASL file requestor.

The processed files are sent to a user-specified directory. A helpful renaming function provides various ways to rename new files automatically. The Destination File Options gadget can be set to Create or Replace. These are somewhat poorly named and are more akin to copy and move procedures. Basically, the Create option retains the original image and the Replace option deletes it. The Replace option is there to prevent the proliferation of duplicate files of the same image.

When processing a batch of files, the Batch Directory Window appears prior to processing. Here you can add and remove specific files and change the Rename string. Information on how many files will be processed and overwritten is presented as well as bad renaming occurrences (e.g., duplicate file names) and free space on the destination volume.

Pegger will process Framestores, IFF24, HAM8, and DCTV 3 and 4 bit-plane files (filtered and non-filtered). Pegger ignores all other types of files, so if you're doing an entire directory, you don't have to worry if there are text or other files in the directory. If the image has an icon file, Pegger will copy over it, too. Cross-block smoothing is available as on option when decompressing.

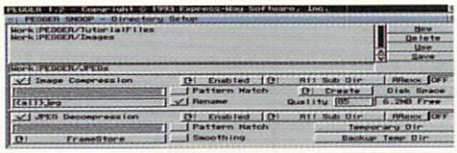
Files are added to a cue list for processing. You can add to, remove from, and even change the order of items in the cue.

Provisions are there to run an ARexx script prior to and right after processing for

even greater flexibility. The task priority is adjustable from the window. An activity light flashes whenever the task is active and a status window also can be brought up to monitor activity in detail. My only surprise was that the JPEG compression quality setting was a string gadget and not a slider.

Snoop

Snoop is the heart of this program and brings everything together. In the Snoop window, you identify directories and subdirectories that you want Pegger to monitor and automatically compress and/or decompress files. All of the settings for CJPEG and DJPEG are available and can be set differently for each directory entry.



Directory Setup Window

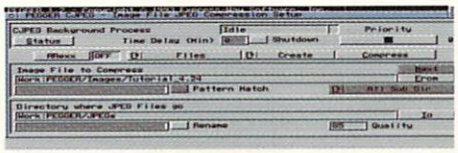
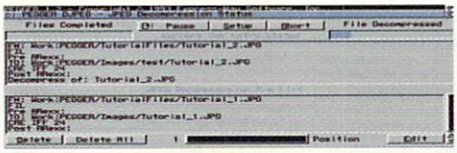
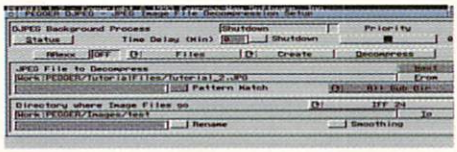


Image File JPEG Compression Setup Window



JPEG Compression Status Window



JPEG Image File Decompression Setup Window

If a file is either read from or written to a "snooped" directory, it is processed by CJPEG or DJPEG according to that directory's Snoop settings. For example, I added the Framestore directory to Snoop for automatic compression and decompression of framestores. Because of the strict framestore file naming requirements, Renaming was not selected and this, in turn ,required compression to be in the Replace mode.

Framestores were saved and loaded transparently, saving more than 500K of disk space each. I also ran LightWave and image-mapped a JPEG compressed framestore around an object. LightWave never knew the difference. The only perceivable variance was the several seconds of JPEG processing time. The duration of Pegger's JPEG processing was generally slightly faster than ADPro, but slower than ImageFX.

Pegger worked with every program I tried, including directory utility programs. It also works when you drag icons between Workbench windows. You can even drag and drop icons on a setup window or AppIcon for processing. A few incompatibilities exist, and the Readme file and manual explain workarounds. It will even continue processing after a reboot or system crash.

Pegger requires DOS 2.0 or greater, 2MB of RAM (a little more than 300K of memory is used when idle) and a hard disk. A 68030 processor or better is recommended. Pegger defaults to using RAM for temporary files, but you can redirect this to your hard disk to conserve memory use. Pegger uses significantly less memory to process JPEG files than other image processors because it works on a small portion of the file at a time. A 3,000-by-2,000 IFF24 file compressed using less than 1 MB of RAM. Pegger's extensive use of icon tool types also allows extreme flexibility in running the program.

Caveats

Because JPEG can suffer from multiple-generation quality loss, it is not always the best format to use when pixel-perfect accuracy is required. Generally, JPEG should only be used on final versions of images. JPEG is not a substitute for full-size 24-bit files, but an alternative for certain situations.

There are a few nit-picky things I'd like to see changed in Pegger. I would like to see a tiny activity-light window. This would provide reassuring information without having to open Pegger's windows. I also think that the Rename feature should look at the last period in a filename not the first, or at least provide a means to do so. Currently, there are rename problems for filenames with more than one period.

The Manual

The manual is quite helpful. Besides a strong tutorial and thorough explanations, the spiral-bound booklet contains interface window illustrations with summarized and detailed explanations of each gadget.

Pegger is a powerful, easy-to-use tool. I highly recommended it for any Amiga owner who works with 24-bit images, not just Video Toaster users. If you consider the disk space Pegger can free up, its price is a bargain.

VTU

[Editor's note: The author wishes to thank Tony Gomez for his help in reviewing Pegger].

Douglas J. Nakakihara is a freelance writer for several high-tech publications.

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REVIEW

Pride PIV-2001

A/B-Roll Editing without Breaking the Bank

By George Avgerakis

[Editor's Note: RGB Computer & Video has filed a lawsuit that may or may not affect the availability of the Pride PIV-2001. Please see our related news story "RGB Files Suit Against Pride Integrated Video" in Toaster Times, page 20.]

Once upon a time, large video companies sold expensive, single-purpose black boxes. Then came revolutionaries, like NewTek and RGB Computer & Video, and the personal video revolution began.

The introduction of the Pride Integrated Video Systems PIV-2001 edit controller marks another milestone in this revolution. The company's product pricing is analogous to the Red Guard attacking the Gang of Four, where the revolutionaries themselves become the fat cats and are dethroned by more revolutionary—read lower-cost—upstarts.

One of my first magazine reviews was of the RGB Computer & Video AmiLink for the Video Toaster. At the time, I was producing a series of promotional videos for PESA Chyron, owners of CMX, the company that invented the standard in video editing. I found it incredible that anyone could offer a full-function online editing system for about $6,000 (three-machine configuration). CMX editors, even refurbished ones, begin at $11,000.

I nearly bought the AmiLink, but thought I would wait to see what developed in non-linear editing. What developed was D/Vision, which is a great offline editor, but really requires exportation of EDLs to an online edit system for broadcast-quality results. I was back shopping for an online controller when this incredible price of $1,995 tumbled out of my mailbox. Attached to it was a brochure describing the PIV-2001.

"OK," I thought, "$1,995 for the program and another couple of grand for the VTR interface boxes." I read the brochure and the 800 number (678-3942) to verify everything I had read. This was like deja vu-ing a scene when the Toaster was introduced in 1990 when I said, "Fifteen ninety-five means 15,995 right?" and the pert redhead in the miniskirt was saying, "Nein, liebchen, 1,500."

"The Pride PIV-2001 is a fully functional eight-machine online edit controller system..."

So rewind the historical tape of your emotions to the day you discovered the Toaster and compare it to this: $1,995 for the edit software and hardware, and you can control up to eight VTRs and eight GPI devices. (You only pay extra for the cable connectors, which are $25 each. You need one for each VTR.)

The Pride PIV-2001 is a fully functional eight-machine (expandable to 64) online edit controller system with interfaces that connects to the serial port of the Amiga 2000, 3000 and 4000 that runs concurrent with and controls the Video Toaster for $1,995.

I had to see this, and after some really aggravating times ironing out the PIV-2001's bugs (and mine too), I found out that it works.

How well it works depends on the VTRs you use. I have an assortment of Sony Betacams, including a BVW-35 (the field SP editing recorder), the BVW-40 and the BVW-15, which is capable of dynamic tracking (DT). The dynamic tracking capability really throws a new PIV-2001 user for a loop.

Although the PIV-2001 has an *advanced editing functions* option, it seems that the editor recognizes the presence of a dynamic tracking machine and opens up the edit list to some bizarre capabilities. For instance, with a dynamic tracking machine connected, the PIV-2001 will gladly accept an OUT point, which is lower than the IN point on the player. Technically, this means that you want the player to play in reverse, which a dynamic tracking machine can do. You can even have a different duration on the PLAYER 1 line of the EDL than on the RECORD line. This means that you want the player to speed up or slow down to fit the duration of the recorder, and PIV-2001 will make the dynamic tracking machine do this.

The trouble is, nobody tells you that all this is happening, and frankly, with an advanced edit functions feature button staring you in the face, you don't think the system will default you into something like reverse play edits. So, let's just say I had some adventures trying to understand what was going on. I tended to blame the PIV-2001 edit controller. The way to keep from going crazy with the DT was to enter a constant speed factor to the EDL and everything worked fine.

After severely lecturing the technical support staff at Pride (I have a bad reputation with the National Association of Tech Supporters, which can be reached at 800-NOW-WAIT), the company promised me it would consider moving the DT functions into the advanced editor control area.

The Famous Digital/Analog Switch

Another glaring glitch I thought I discovered was this ugly effect of jumping two frames back in time after a DVE Toaster effect while editing with the PIV-2001. For several years, I've been doing seat-of-the-pants edits on my Beta decks by hitting the space bar to execute all effects. I never see any glitch on say, effect D-41 (push right). Not so with the PIV-2001 editor. It follows strict Toaster rules as outlined in the Switcher chapter of the Toaster 4000 manual (pages 13 and 14), which gives you a glitch as you enter or exit certain DVE effects in certain combinations of digital and analog sources.

However, that's not all. If you go to the Toaster control panel (it also stares at you from the Amiga monitor running PIV-2001), there is an option to control the Toaster manually. Pride technical support suggests you do this for any DVE effects. All other effects—wipes, dissolves, etc.—work fine under online control.

Toaster Control

The fact that RGB Computer & Video's AmiLink is the only other serious Amiga-based edit controller to support the Toaster demands that the two be compared. Having tested both, I find AmiLink to be much more elaborate. For instance, the PIV-2001 does not allow more than one action per edit event, with the exception of a split edit that allows you to delay video or audio. This is the convention in editing.

The AmiLink allows dozens of actions, such as multiple audio track in-and-outs, within one event. Therefore, I would characterize the AmiLink as a more elaborate editor than the PIV-2001. However, make no mistake, the PIV-2001 can do anything that a CMX-3400 can do as far as I could tell after two days of extensive testing.

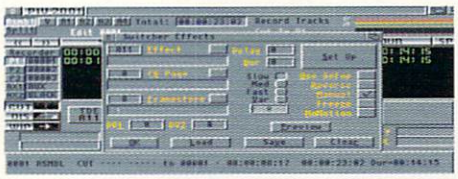
The PIV-2001 is booted from Workbench before the Toaster. When the editor screen appears, you get a Load Toaster? message. If activated, PIV-2001 brings up the Toaster screen, loads the current project and book and returns you to the editor. The PIV-2001 Toaster interface is similar to the AmiLink interface, allowing extensive control of the Toaster without actually going into the Toaster Switcher. When you go into the Toaster, all functions are available. You can go into CG or LightWave 3D and even CTL-ALT back to the Workbench without affecting the editor.

EDL Manipulation

Early releases of the PIV-2001 software did not allow for importation or manipulation of an edit decision list (EDL), but the version of software I used for this evaluation does. You can cut and paste and copy lines of edit commands, ripple and clean edits effortlessly.

As this review sweated through my keyboard at the deadline hour, I paused to see if the PIV-2001 would allow me to import a CMX edit list from my D/Vision-Pro nonlinear editing system. I downloaded a short EDL in CMX format to an IBM floppy disk (D/Vision runs on a PC) and copied the file to the Amiga using Cross-DOS. The PIV-2001 refused to acknowledge the D/Vision file because it was looking for a ".list" suffix, and the D/Vision writes CMX EDLs with a ".edl" suffix. I tried changing the name in the Amiga. This resulted in the PIV-2001 seeing the file, but when I loaded it into the EDL window, nothing came to the screen.

PIV-2001 features a friendly operating screen.



Here is where you load, save, and edit EDLs.

I would seriously recommend that users of any Amiga-based editing system get larger, higher-resolution monitors. I use my Amigas exclusively for Toaster work. For that, the standard Amiga monitors are fine. However, my D/Vision system is equipped with a high-resolution Viewsonic 17-inch monitor, which is truly a treat to view. When it comes to looking at EDL numbers for eight hours a day, you want something better than the standard Amiga 14-inch screen.

Machine Manipulation

The PIV-2001 has an optional machine control pad, but I found no advantage in using it. All machine scanning can be executed by using the Amiga mouse to pull a white icon left and right along a graphic slider. The machines perform dutifully for the most part, although I found an occasional tendency for the icon to become sluggish and refuse to budge.

Oddly, Pride doesn't seem to have noticed that all VCR scan control knobs have a detent or spring-loaded stop position. Neither the mouse-controlled software nor the optional machine control panel have a detent stop position. This really aggravates editors because they can't simply let the mouse or dial go and see the machine pause. The machine will creep, even when the EDL line is saying that it is still.

A great function in the PIV-2001 is a button that lets you bump any machine forward or backward during play or even during an edit. This is great for matching the sync between the recorder and the player or between two players. Simply set up the edit as close as your ear can tell, preview the edit and bump one of the machines until the echoing effect of the mismatched audio tracks goes away. This reminds me of the old Movieola flatbed "bump" button that does the same thing with film tracks.

Easy Procedures

The procedure of setting up and running an edit is simple. Enter your IN and OUT points numerically or by mouse clicking the appropriate crouton. Then click the transition effect (Cut, Wipe or Dissolve). Next, the PIV-2001 asks you which sources you want, and you simply click the appropriate croutons. The system automatically switches you to the Toaster's main screen where you can pick your effect (or do any other Toaster work you want). A double-right click takes you back to the edit screen where you start your edit. When completed, the active EDL lines move to the scrolling EDL window at the bottom of the screen.

To Buy or Not to Buy

The hardware, a 19-inch, double-height, rack-mountable box, powered by a 9-volt wall socket transformer is simple and worked flawlessly. I certainly appreciated not having to wire up all those V-LAN boxes with their annoying blinking lights and non-standard rack size.

The software is certainly extensive enough to satisfy any traditional CMX-capable editor, although novices, familiar with Sony RM440-style two-machine controllers will experience some heavy camber changes going around the PIV-2001 learning curve.

Aside from some annoying characteristics and maybe a bug or two that are common in any program that is rushed as fast as PIV-2001 was to the market, I can't see any reason why anyone shouldn't buy this package. You can amortize the cost of this hardware on the first job!

VTU

George Avgerakis is founder of Avetka Productions Inc., a motion picture production company in New York City.

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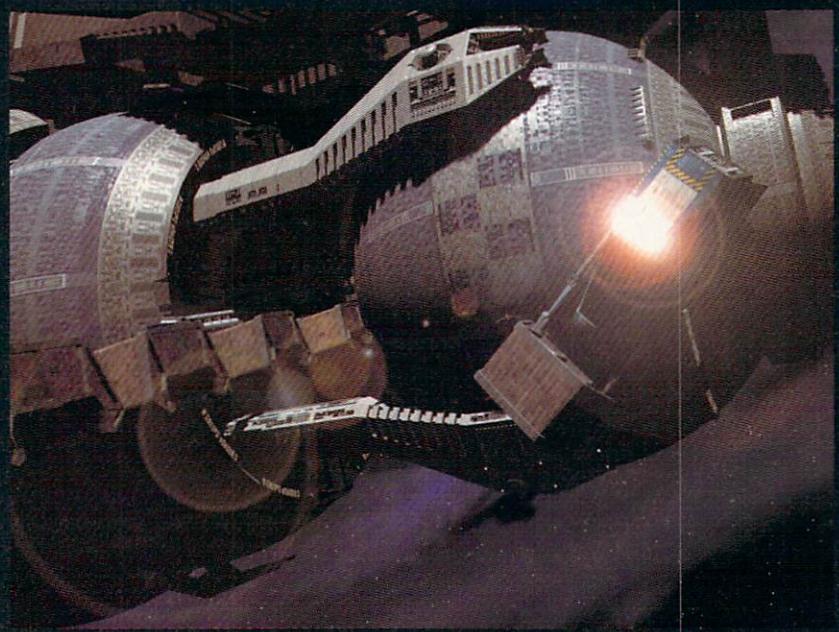

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REVIEW

The Prime Image Y/C++
A New Transcoding Solution

By Frank Kelly

For Video Toaster users with S-VHS or Hi-8 video decks, using the composite video inputs and outputs of the Toaster can be somewhat frustrating.

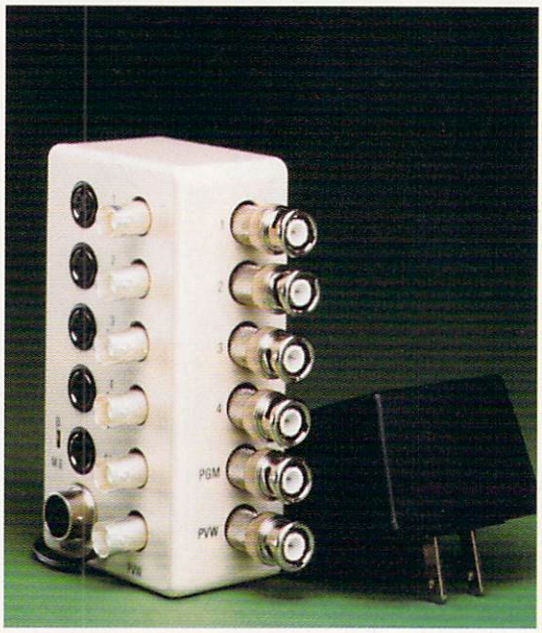
It is widely known that keeping chrominance (video color information) and luminance (monochrome video information) separate for as long as possible in your signal path will hold picture degradation to a minimum.

Most S-VHS and Hi-8 signals are capable of reproducing a picture that contains more than 400 lines of horizontal resolution if they keep luminance and chrominance separate. However, using the composite output of your S-VHS or Hi-8 deck will usually yield only about 240 lines of horizontal resolution.

Because any videotape source fed into the Toaster requires time base correction, the process of combining the separated chrominance and luminance signals can be accomplished during this step.

With a transcoding time base corrector (TBC), you can bring your Y/C signals into the Toaster's composite inputs with full resolution as long as the unit processes the signal with a high enough bandwidth to maintain the luminance detail information. An easy way to figure the amount of resolution a unit will process is to look at the bandwidth of the device's output as measured in megahertz (MHz). Multiply that figure by 80. The result is the approximate optimum horizontal resolution the device can produce. Most of today's transcoding time base correctors operate with a bandwidth of 5.5MHz, which translates to a horizontal resolution of 440 lines at their composite output.

Once the signal is inside the Toaster, it is processed digitally with no appreciable loss. The Toaster's composite output is capable of producing nearly all of the original signal's horizontal resolution.



"The Y/C++ performed flawlessly and finally gave me the flexibility to use the various video formats at my disposal with few configuration headaches."

The trouble begins when the composite signal from the Toaster is degraded somewhat at the input of your record VTR. The VTR's composite input signal is decoded to separate the chrominance and luminance signals prior to recording. This decoding can reduce picture detail by about 20 percent to 50 percent, depending on the quality of the circuitry in your particular VTR.

After-Market Products to the Rescue

Last year, the Y/C Plus became available. It allowed for high bandwidth transcoding of the inputs to the Toaster and processed the output with comb filtering.This type of filter reduces some of the dot crawl and cross color artifacts that occur when some computer graphics are translated to NTSC signals. This is not a problem that is exclusive to the Amiga or the Video Toaster. It occurs on every video platform using computer-generated graphics.

Obviously, there was a strong need for a product, like the Y/C Plus, to filter out those undesired artifacts while providing the ability to transcode Y/C signals to composite.

While the Y/C Plus has been a significant product over the last year, Saratoga, Calif.-based Prime Image has now developed a unit it claims will do even more: the Y/C++ ($699).

With such a similar sounding name and so many common features, it wouldn't be fair to those shopping for this type of equipment, not to do some comparisons of the two. In all fairness to the Y/C Plus, Prime Image has had a year to develop a lot of features for the Y/C++ that are obviously intended to make it a better mousetrap.

Y/C Plus vs. Y/C++

Installation

The Y/C Plus is a circuit board that requires the use of an internal slot of your Amiga and attaches to the Toaster's composite inputs and outputs via ribbon cables. Those ribbon cables are not shielded and can be

affected by other components that create unwanted interference in the video signal.

The Y/C++ is a stand-alone unit that attaches directly to the Toaster's external BNC composite inputs and outputs on the 2000 and 3000 chassis. Those with 4000 systems will need to use shielded composite cables to attach the Y/C++ to the Toaster's composite connectors because of the lack of clearance needed to snap it in place on the back of the 4000's chassis.

It should be pointed out that neither product can connect to the Toaster's inputs digitally, which has led to some confusion for those who believed the ribbon cable method provided an advantage. The Y/C Plus ribbon cable connects to the contacts on the edge of the Toaster. These contacts are merely a tap to the composite analog signals that are available through the Toaster's external BNC connectors.

Power Connectors

The Y/C Plus gets its power from the Amiga power supply. The Y/C++ is externally powered via a 110 AC-to-6-watt DC power converter.

Video Input/Output Connections

The Y/C Plus offers either Y/C or composite Toaster inputs and outputs, which are selected by adjusting internal circuit board jumpers. The settings are mutually exclusive. In other words, you can have one or the other, but to change the settings, you must open the computer to access the jumpers.

With the Y/C++, composite, Y/C and component (switch selectable for MII or Betacam) of the Toaster's program output are all available simultaneously.

Another capability that could easily go unnoticed is the ability to use the Y/C++ as a standalone transcoding/filter without connecting it to the Video Toaster. There might be more than one occasion when having such a device on hand would be useful. Previous standalone transcoders required at least a single rack space and cost nearly twice as much. The Y/C++ takes little more space than a Sony Walkman and delivers broadcast-quality performance with plug-and-play simplicity.

The Y/C++ also allows access to each of the Toaster's four inputs with any combination of composite or Y/C signals. Inputs can be selected by individually mounted external switches. This feature is useful for those with a combination of composite and Y/C input sources. The preview output of the Toaster is also always available. It is not comb-filtered, so by simply comparing the preview and program outputs separately, you can tell what the effect of filtering is on your final output signal.

Comb Filtering

You may have noticed that some of your computer graphics—especially titles—can exhibit a particular aberration called "dot crawl." This artifact is a product of interference between the harmonics of the chrominance signal and the harmonics of the luminance signal at its horizontal rate. To reduce this crosstalk between the signals, a filter tuned to the offending frequencies is used to comb out the unwanted interference. Although this technique isn't new, the components needed to pull off the filtering have improved and thus, so has the resulting signal.

Older technology used simple bandpass filtering, which gave the picture a smoother but softer look that was undesirable in successive generations. Both the Y/C Plus and the Y/C++ use virtually the same components to accomplish the comb filtering.

The Y/C Plus was designed by the Faroudja Labs, well-known for its video encoding technology. The Y/C++ has the added benefit of using an adaptive comb filter, which changes its filtering characteristics to match the peculiarities of the input signal. Adaptive filtering can produce subtle differences in the output signal, depending on the content of the video signal being processed.

"...the Y/C++ takes little more space than a Sony Walkman..."

Based upon my observations, I could see no differences in the performance of each product when comparing particular Toaster framestore images that were prone to exhibit dot crawl. Both units did an excellent job of reducing the aberration, so it was not easy to determine which had the advantage in this area.

I tested the Y/C++ on an Amiga running the 3.0 version software and a Toaster 4000. When comparing the performance of the Y/C++ on both versions of the Toaster hardware, the filtering effect was more evident with the earlier version of Toaster hardware. This indicates to me that NewTek has improved the overall video performance of its latest Toaster.

In all cases, including tests of the Y/C Plus, the effect of the filtering on incoming prerecorded video material was virtually transparent.

To keep my tests as objective as possible, I passed prerecorded video and computer graphics through a waveform monitor and vectorscope. I did not detect a difference between the original and the processed signals as displayed on the test equipment. Nor did the processed video signals appear different from the originals to my eyes. The only difference I detected was a reduction of dot crawl in the computer graphics framestore.

The Component Connection

For those lucky enough to have Betacam or MII equipment, the Y/C++ offers an even more enticing advantage. Its Y, R-Y, B-Y connections make for better overall fidelity of recordings on Betacam and MII decks. There are subtle voltage differences between MII and Betacam, so the Y/C++ provides an externally mounted switch to enable each mode.

Some may argue that supporting these formats is overkill because of the high cost of this level of equipment versus the typical budget of the average Toaster user. However, the recent introduction of the Sony UVW series of BetacamSP decks has nearly cut in half the cost of entry level BetacamSP systems. MII prices are already quite competitive.

Comparing the output quality of BetacamSP or MII to that of Hi-8 or S-VHS is akin to comparing the output of an RGB monitor to that of a composite feed of the same signals. Component formats, such as Betacam and MII, provide superior performance over successive generations when using the component dub connections. It shouldn't be unreasonable to expect many Toaster users to consider upgrading to these formats. (For more information, see "Sony's UVW Betacam: Affordable Component Video," by Tim Doherty on page 98.)

The Final Analysis

The Y/C++ performed flawlessly and finally gave me the flexibility to use the various video formats at my disposal with few configuration headaches.

However, there are two important features I would like to see available on this product: the ability to use the Y-688 dub signals from my 3/4U equipment without needing an additional transcoder to bring the Y-688 signals to standard Y/C; and, support for component input signals to the Toaster from Betacam and MII.

Although it falls short of being the ideal solution for those with 3/4U and Betacam/MII formats, the Y/C++ seems to be designed to meet the needs of Toaster users who anticipate using the majority of widely available video formats. The Y/C++ rates a B+ on my grading curve for quality, value and usefulness.

VTU

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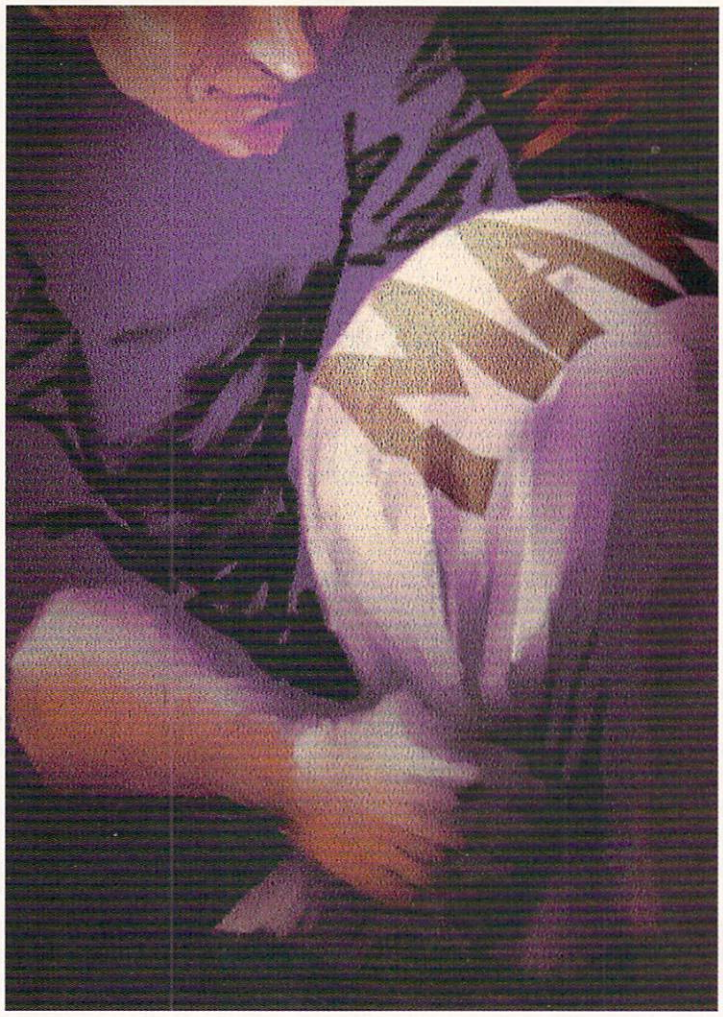
All About Maps

By Mojo

After spending every evening for the last six months modeling the Sistine Chapel, the magic moment is upon you. Every nook and cranny has been painstakingly recreated in exact detail from every reference book imaginable. You even spent thousands of dollars on a trip to Italy to eyeball the colors for the sake of authenticity (and a tax write-off). You hit the render button and confidently await the magnificent image that will undoubtedly bring you fame and fortune.



It looks awful. You pull your hair out and scream at the Toaster. Your dog hides behind the sofa as you swear you've done everything possible, and you can't figure out why all this work has amounted to little more than a few complicated, shimmering blobs.

For the answer, think back to yesteryear, or, depending on your age, yesterday, when you were building model kits of the Starship Enterprise, race cars and planes. Remember how after the last drop of glue had dried and you compared your creation with the picture on the box, you thought, "Mine looks awful." The picture looked like a real spaceship, ready to tackle the galaxy, while yours simply resembled a heap of cheap, white plastic with lopsided engines.

However, once you went through the trouble of breaking out those little bottles of paint, applying the decals and maybe even airbrushing a few scuff marks, it began to look like something. If you were *really* ambitious, you'd add a lighting kit and even the hobby shop guy was impressed.

By the same right, modeling is only the beginning of making a good 3D object. After you first hit that render button, you probably wind up with something hauntingly similar to the white hunk of plastic (but, finally, with straight engines). This is because painting and adding decals (surface and texture mapping) to your 3D object can be just as important, if not more so, than building the model itself. It's just like in the old days!

Getting Started

While working in Modeler, be sure to give the various pieces of your object an appropriate surface name (such as *headlight, door* or *ash tray interior*). Giving a complex object a single surface name, such as *car* would be tantamount to dipping your entire model in a bucket of paint—easy but not very impressive.

Don't worry about having a lot of surfaces—good objects can have dozens (the model of Babylon 5 has 157). This takes the guesswork out of surfacing and even helps modeling. When working on a complex object, it's often a lifesaver to be able to select buried polygons via their surface name. You can always consolidate your surfaces when the model is finished; then, you will have a better idea of what the finished product is supposed to look like.

At this stage you should have something that looks like an unpainted plastic model kit—very boring. A textbook example of the difference good mapping can make is Ron Thornton's SpaceFighter model shipped with Version 2.0 and up of the Toaster. Figure 1 depicts a rendering of this object with no surface tweaking. It is a testimony to lazy model making. It would probably take a novice more time to make an omelet. It's OK, but it needs more.

Beer Labels

When applying an image as a color map, you effectively either paste it onto or wrap it around your object, covering what's underneath the image. This technique is commonly used to make planets and beer cans. In the

case of our home planet, spherically wrapping a scanned image of the continents around a sphere would do nicely, while cylindrically applying a label to a squat tube could lead you on the way to your own virtual brewery.

Color maps are also a good way of applying decals, insignias or any other item where multiple colors must be applied to an object in a specific shape. However, for an overall shift in your model's appearance, it's better to apply a texture map.

Texture Maps

Many believe a color map is a texture map, but to understand both, it helps to separate them in your mind. A color map hides your object and replaces the surface, while a texture map augments it, modifies it, and textures it. A texture map won't change the color of your object or its color map. It only enhances what's there.

Take a look around you. Most surfaces you see—a wall, a table, a computer—all contain perhaps several primary colors. The rest is lighting and texture. The wall may be a solid gray, but the small bumps and dirt are its texture. Those textures can transform a 3D object from the dull and ordinary to the fresh and exciting.

Because color and texture maps can peacefully co-exist, you could make the earth's oceans shine or your beer can smudged. In this case, a simple texture map is going to transform the SpaceFighter into one of the Toaster's most popular objects.

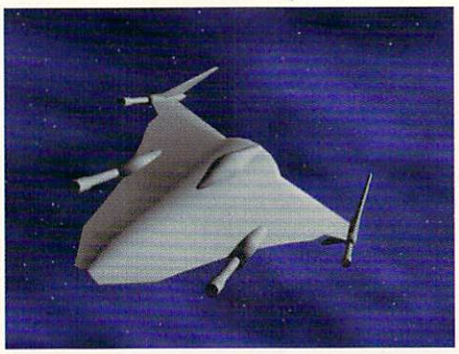


Figure 1

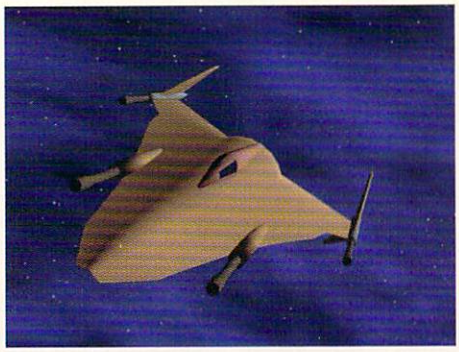


Figure 2

Figure 3

More Wood

An often overlooked method of texturing an object is through a diffusion map. Diffusion defines to what extent light is scattered across an object's surface (how much light it receives). A plain piece of white paper is diffuse. Glass, however, has almost no diffusion value. It receives so little light you can see through it!

While many objects fall between these two extremes, most surfaces actually contain several diffusion values. A wooden table, for instance, looks darker across the areas of grain due to varying color and diffusion levels. In fact, you'll rarely find a surface that is completely even in its diffuse value, if not from being made of various materials then from inconsistencies, such as dirt and smudges. These effects and others can be achieved by simply applying a diffusion map to an object.

Look at Figure 2 of the SpaceFighter. The object has been given various brown and gray colors by changing the color values for each surface. However, it still belongs in the rendering ash heap. Figure 3 shows a dramatic transformation with the addition of panels created via diffusion mapping.

There are no panels actually drawn on the surface, simply light and dark areas in the shape of panels. The diffusion map, a painted gray scale image of the panels, simply tells LightWave to create diffusion values for the object based on the map. Black areas of the image are 0 percent diffuse. White areas are 100 percent and grays fall in-between.

Using a diffusion rather than a color map has many benefits. A color map of brown panels could have been used, but then modifying the color of the object would require re-painting the map. Remember, color maps cover the object. When using a diffusion map, altering the color values changes the surface color. The diffusion map will effectively lighten and darken your object, retaining whatever information is in the color channel.

A great way to dirty down an object is to apply fractal noise as a diffusion map over your color map. By increasing or reducing the texture value inside the procedural requester, the dirt or smudges will appear more or less pronounced. The main texture value defines the value for areas not covered by the texture.

This is also a wonderful way to get the most out of your existing texture maps. For example, try applying the wood image that comes with the Toaster to a surface as a color map. However, if you prefer a darker wood shade, you'll need to re-color the map in a paint package or use another map. Instead, by using the same wood texture as a diffusion map, all you need to do is change the object color and presto, you have a new wood texture.

Specularities

Specularity and its accompanying glossiness button allow you to define how shiny an object is. Surfaces such as metal, plastic, and glass produce hot spots of light that get reflected back into the camera. These are specular highlights and can greatly enhance the realism of an object.

Figure 4

Figure 5

Look at Figure 4 of the SpaceFighter. The specularity has been turned on and the light placed at an angle to produce a nice shine across the surface of the ship. This is a common look in much of the computer graphics produced in recent years. It looks fine, but it could look better.

Specular highlights such as this make everything they're attached to look like flat plastic. Few surfaces in the world have such smooth, uninterrupted shines across them. Dirt or smudges will alter the specular landscape.

Surfaces made with various materials or painted with a variety of paints will have the same effect. Even the wooden table mentioned earlier will have a broken specularity. Obviously, specularity must be applied to 3D objects if realism is an objective.

Specularity mapping allows you to create different specular levels on a single surface, thus producing highlights of varying intensities. It works on the same principle as diffusion mapping, where a grayscale image mapped to the object tells LightWave how specular a certain area is. In many cases, the diffusion map can double as the specular map. Such is the case with Figure 5.

The various panels now have different sheens to them, truly making it look as if a variety of materials were used in its construction. This can be the final touch that brings an object to life.

The glossiness button gives you more control over specularity by letting you define how controlled your highlight is. Low glossiness lets the specularity travel over a wide surface area, much like metal and varnished wood tables. Maximum allows you to create a very small, concentrated highlight, such as that found on plastic or hard, spherical shapes (like a wine glass or R2-D2's head).

As with diffusion mapping, you also can use procedural textures, such as fractal noise, to create a specular map. In the case of the dirt and smudges, with fractal noise, you might want to apply the same settings (so the noise areas match) as a specular map. This way, as happens naturally, the specular sheen will be interrupted in the areas where the noise, that is dirt, is visible.

Another example of doubling up a map might be if you were creating rust on a car bumper.

"Specularity mapping allows you to create different specular levels on a single surface...."

You could use a color map of rust to create the imperfections, then apply that same image as a specular map to prevent a shine where the rust occurs.

However, remember that diffusion and specular maps work according to the luminosity (grayscale) value of the image being applied. The rust image will probably be a dark red or brown, which will be read as a very low specularity value. To be certain that no shine occurs in these areas, you must load the map into an image processing program or paint package and reduce the levels to pure black. By the same token, brightening a specular map will increase the brilliance of your highlight.

That's All Folks

Diffusion and specular mapping are the two least- understood elements of mapping in LightWave, but they are perhaps the most powerful. With a little attention to texture mapping, you can begin to create far better objects with a minimum of effort. If there is a secret to good 3D imaging, it probably lies in the fact most people ignore the importance of texture mapping. After all, that's all the Sistine Chapel really is—a couple of decent texture maps.

In future articles, I will explain effects mapping, including luminosity, reflection and transparency. In the next feature, we'll look at some hands-on tips about mapping.

VTU

[Editor's note: Special thanks to Ron Thornton for contributing to this article.]

Mojo was born in a small quagmire off the Bayou in Louisiana. He spent many years eating ribs in Manhattan before gastro-intestinal difficulties forced him to move to Los Angeles and seek work with Foundation Imaging on Babylon 5. *He has little or no involvement with the failure of NASA's recent Mars Explorer and a bit to do with the Toaster 4000. Write to him with questions or send Elvis memorabilia in care of this magazine.*

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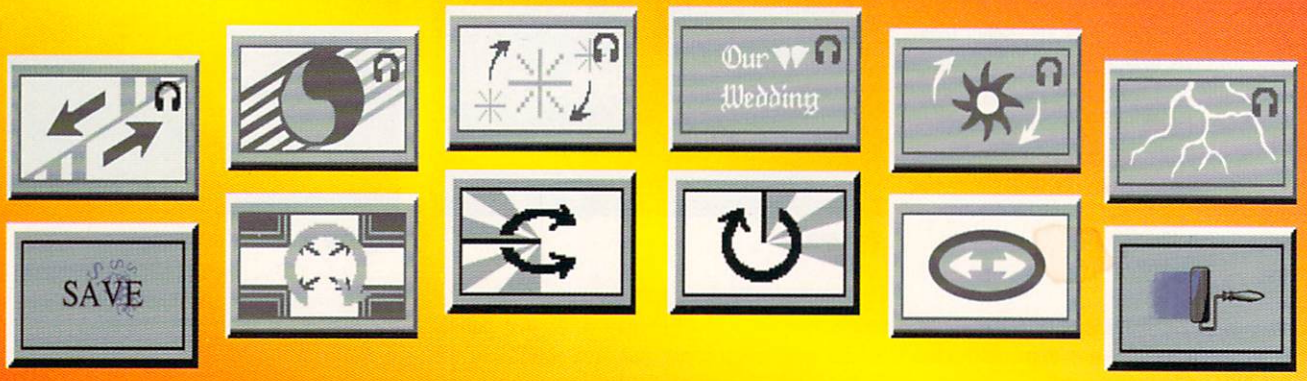

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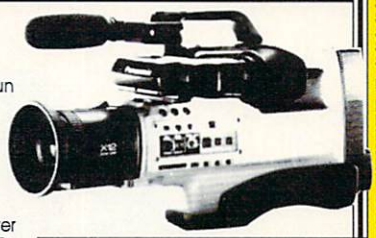

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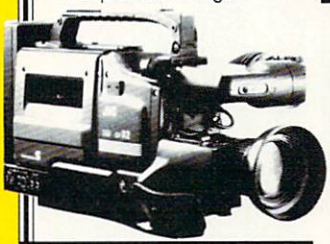

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TUTORIAL

From Business Cards to 3D Logos

By Bob Anderson

This magazine often features articles that attempt to demystify the Toaster's LightWave 3D program. I know that there are an awful lot of you who think that the program is cool, but that it's too complicated. You may have even opened the manual to try the tutorials and shortly thereafter, found yourself in over your head.

One of the biggest money-making opportunities for a Toaster owner is using LightWave to create 3D logos.While making these animations does require some knowledge of LightWave, the following process removes intensive modeling work and at the same time, will reduce the anxiety often experienced by new LightWave users.

The new version of LightWave crams hundreds of new features into an easier-to-use interface, and there are a few other programs that enhance LightWave's abilities, as well as make it easier to use. For this article we will concentrate specifically upon three: Art Department Professional (ADPro) by ASDG, DeluxePaint IV (DPaint) by Electronic Arts, and Pixel3D Professional by Axiom Software. (Note: There are plenty of other programs that can perform similar functions, but I prefer these for the purposes of this tutorial.)

With these programs, you can easily focus your camera on a well-lit piece of camera-ready artwork, or even a business card, and in a few minutes have a custom-made 3D object ready to animate. You will obtain the best results using a high-contrast (black-and-white) image, and the model will require less touch-up work if you use a good, clear piece of camera-ready artwork.

Grabbing Art

ADPro is a powerful image manipulation program. To a Toaster owner, its most important function is its ability to reduce the number of colors in an image. The Toaster always saves images in 16.8 million colors; this is what enables the Toaster to render broadcast-quality images. Unfortunately, the resolution is too high for many other Amiga programs. You can load images from the Toaster into ADPro, and reduce the resolution (number of colors) to allow them to be loaded into other programs.

If you framegrab a logo off a black-and-white business card and bring it into ToasterPaint, you can easily see that you've got several shades of both black and white. In this case all you want is two colors. ADPro will reduce your camera-captured art to this resolution. Often, when working with logos, you want to work with a limited palette. Eliminating all of this unnecessary color data allows easy manipulation of the image.

It is important to light the logo evenly and ensure the camera is focused. Once the logo looks clear on your monitor, freeze the image and save it as a framestore. (If you are unfamiliar with this process, refer to your Toaster Manual.) ADPro will load the framestore and reduce its resolution. Owners of older versions of ADPro won't have the ability to directly load framestores; however, the image can be saved as an RGB through ToasterPaint, and loaded into ADPro as an IFF.

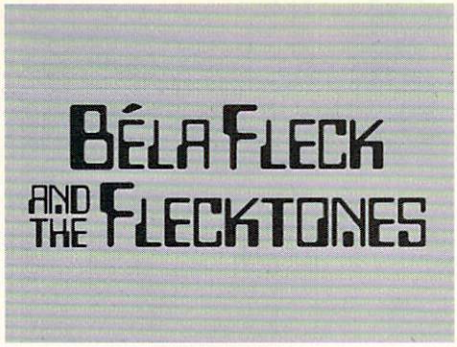
To get your framestore loaded into ADPro , simply load the image using the Load button, set the Colors requester to the fewest number possible, (typically 2,4, or 8 colors); then hit the Execute button which renders the image to your computer monitor. Now save the image using the Save button. It's that easy.

ASDG, the manufacturer of ADPro, also has another useful program called MorphPlus. This software contains all of the functions I've described above, as well as the ability to do image morphing. MorphPlus is limited in its image manipulation abilities when compared to ADPro, but most of the functions that one would use on a daily basis are found in MorphPlus; therefore it might be a better choice for someone who is just starting out. Besides, you'll have a great time using the morph functions.

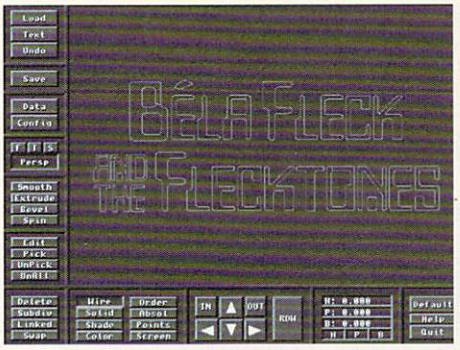
Touch-up

Now that we have a limited-resolution image, we can load it into DeluxePaint. You'll use this program to do minor, final touch-up work, like removing small imperfections, or eliminating smudges, stray pixels, or specks that may appear in your image. You may even find that you can skip this step in many situations.

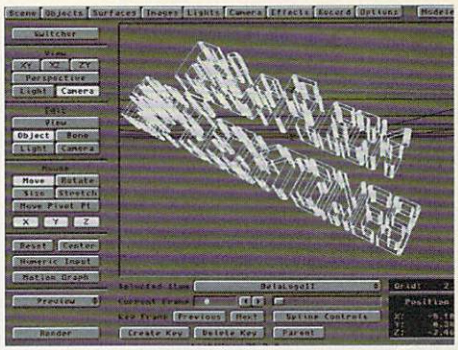
Start the program, and select High Res as your screen preference. Use the right mouse button and select the Picture menu at the top of the screen. Pull the mouse down over the Load requester. Locate the file you want to load and load it. Now you have access to all of DPaint's tools for touch-up. When finished, pull down the Picture menu again and select save. Now you're ready to convert this image into a 3D object.



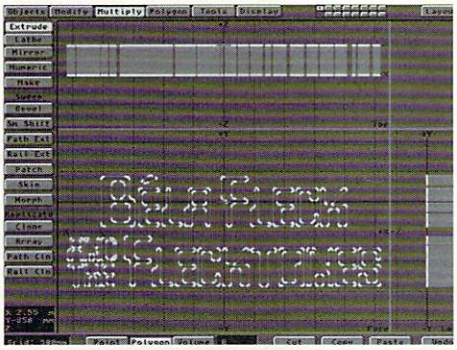
Framegrab a logo off a black-and-white business card.



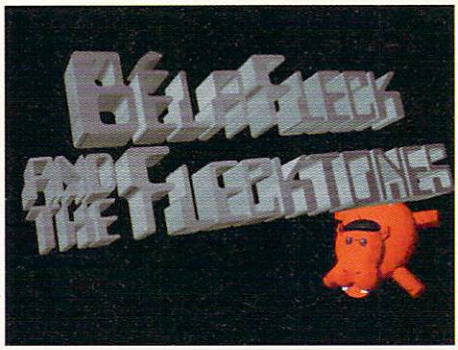
Smooth and extrude the object in Pixel 3D.



Once in LightWave, assign surfaces and render away.



In Modeler, you can tweak the object or delete points.



A money-making 3D logo in just minutes!

3D Conversion

Pixel 3D Professional is a program packed with functions, but its "bread and butter" is the ability to convert bit maps into objects. This means we can take the image that we just touched up in DPaint, and with a few mouse clicks have a 3D object ready to render.

As I said earlier, ADPro is used because the Toaster saves images at a higher resolution than Pixel 3D can work with, but now that it's saved as two or four colors, we are ready to turn it into an object.

Load your image by clicking the Load button in the upper-left corner of the screen. Locate the file and hit accept. In a few seconds the image converts to an object.

In some cases, you may notice that the object is aliased. (Aliasing is the "stair-stepped" look you may notice on some edges of your object.) This is a normal result of working from a video-captured image.

Pixel 3D has a built-in smoothing function that helps eliminate aliasing. Find the button on the left side of the screen labeled Smooth. Clicking on this opens the Smoothing Settings requester. You'll see three buttons along the top of the requester labeled Small, Medium and Large. These are preset smoothing algorithms and usually work well. You want to use the minimum amount of smoothing possible, as settings too high can alter the object. Try the low setting first and you'll probably see effective results.

At this point you have a 2D object. To add depth to the object you can select the Extrude function (found directly below the Smooth button). This panel may appear somewhat confusing at first. You'll want to select the Regular setting, as opposed to the Color setting, until you get the hang of how the program works. Set an extrude value of 5 by clicking on the up arrow next to the Extrude Value window. Click OK and you've got yourself an extruded, custom-made 3D object.

Click the Save button. This brings up a requester with Pixel 3D's impressive list of 14 object formats. Click on the LightWave 3D button and tell the program where you want to save the object. Now you can load it into LightWave, assign surfaces and render away.

For those who are somewhat more familiar with Modeler, you might find better results by converting the image into an object in Pixel 3D and loading the object into Modeler as a 2D object. You'll find it easier to tweak the object or delete unnecessary points while the object is not yet extruded. Once the object looks good, simply extrude the object in the Modeler.

This entire process shouldn't take much more than one hour on your first attempt; once you get the hang of it, you can literally start with a business card logo or camera-ready artwork and have a finished 3D model in five or 10 minutes.

AdPro, DeluxePaint, and Pixel 3D greatly enhance the Toaster's already powerful LightWave 3D program. With a little practice, you'll be turning out great-looking, money-making logos in no time.

VTU

Bob Anderson is NewTek's Tech Support Manager and the proud father of newborn daughter Laurel Anderson.

Companies Mentioned:

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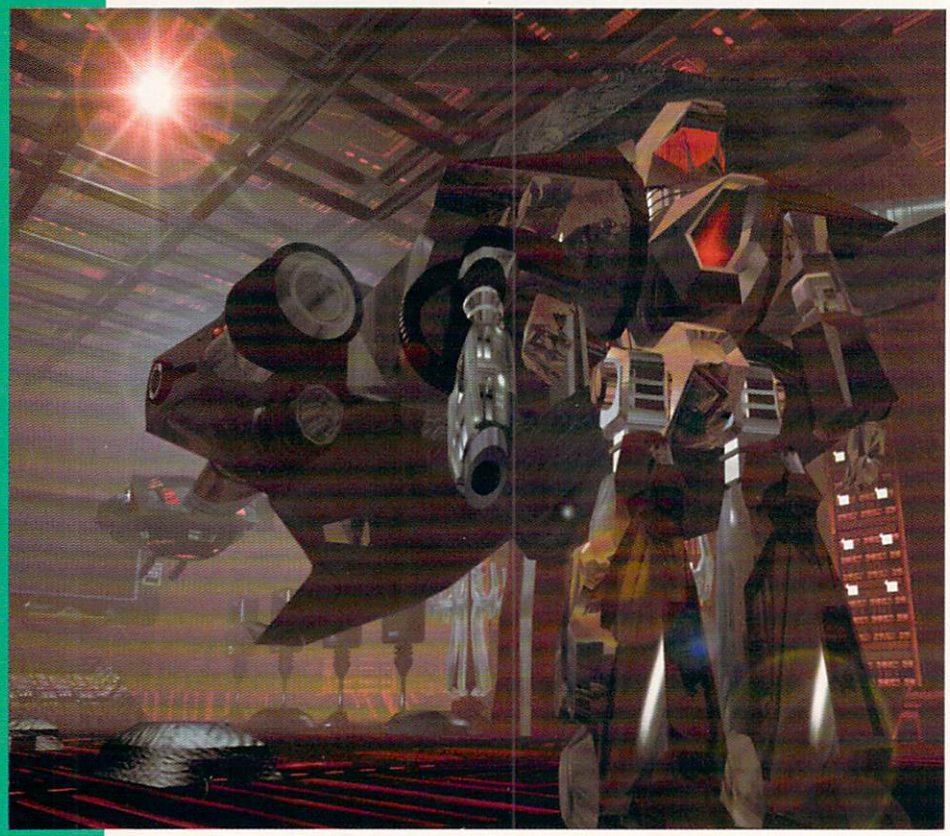
Four Steps for Turning a Business Card Logo into a 3D Object

1. **Framegrab and save a well-lit, well-focused image.**
2. **Convert to two-color image in ADPro.**
3. **Touch up in DPaint, if necessary.**
4. **Convert to object and extrude to 3D in Pixel 3D.**

TOASTER GALLERY



David Lo

The three high-resolution works by David Lo were completed with his Amiga/Toaster systems. The robot was originally modeled in a week and a half in Imagine with an Amiga 2000 and then heavily modified with LightWave 2.0. The final rendering, completed with a Toaster 4000, a 68040 accelerator and 60 MB of RAM, was completed in 40 minutes

Many of the details in the elevator scene were created using the beveling and smooth functions in LightWave 3.0. Lens flare and fog effects were essential to the atmosphere.

The space cruiser was modeled and rendered with a Toaster 2000 in two weeks. The final rendering was completed in 30 minutes.

David Lo is a 3D modeler and animator based in Costa Mesa, Calif.

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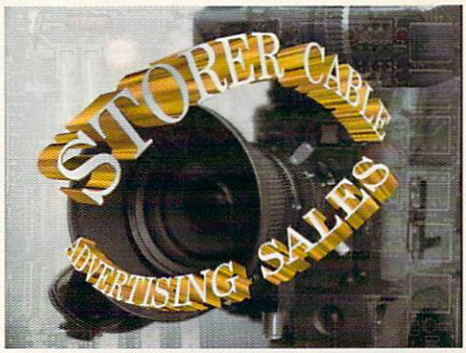
Enrique Munoz

"Self-proclaimed LightWave expert" Enrique Munoz, 14, finished *Time Keepers* (below left) in 36 hours and 57 minutes in high resolution with ray tracing on for refraction and reflection. The texture was created using Deluxe Paint 4.5. Munoz noted that the work was inspired by a fathers day card he saw and that he was most challenged by attempting to get a convincing look for the glass. He also created *Family Room* (top).

A South Gate, Calif.-based artist, Munoz is in the process of starting an animation company with his father.



Robert Kerly

This cable television advertisement (above) was designed on a Toaster 2000 system with a 68040 accelerator and 33 MB of RAM. The original PageStream fonts were imported to Pixel 3D and then brought into LightWave for extrusion, bending, and the assigning of the white and gold surfaces. The rendering time in high resolution was 10 minutes; the modeling was finished in 30 minutes.

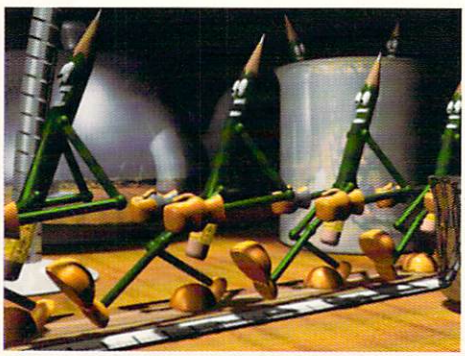
Kerly is a production manager at Dover, Del.-based Storer Cable Communications.

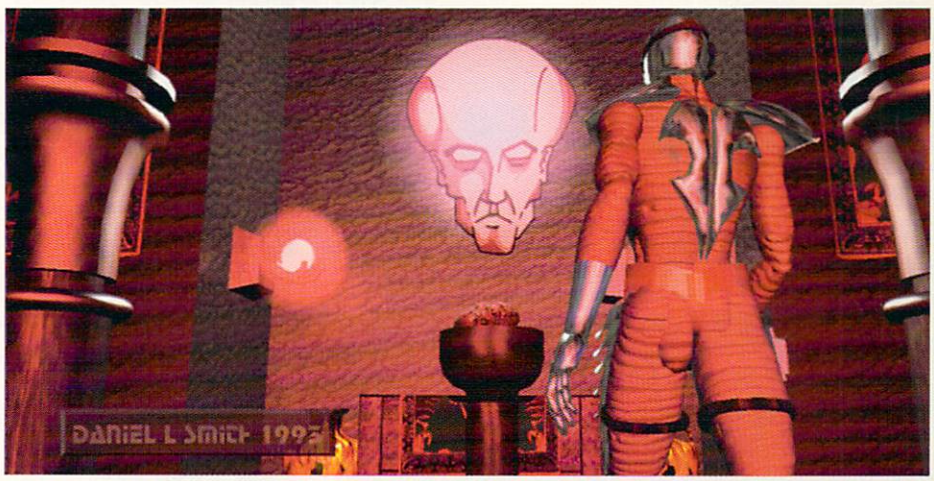
Christian Aubert

Originally created by the German company, Spans & Partner, on an SGI platform running SoftImage software, Christian Aubert's rendering of *Toy Soldiers* was done with LightWave 2.85 on an Amiga '040 with 18 MB of RAM. He's most proud of the fact that the piece is of the same quality as the one done on the SGI platform while his Toaster system cost less than a tenth of the SGI price.

Toy Soldiers (below), took five hours and 50 minutes to render. It is made of 190 objects, (almost 60,000 polygons). Aubert said it took so long to render because it uses full antialiasing, depth of field, shadow mapping and trace reflections.

Aubert is a computer artist based in Quebec.





Daniel Smith

Smith's *Temple* (above) is a frame from a three-minute demo animation, *Kallektur*. Completed with an Amiga 2000 with Toaster 2.0 software, a 68040 accelerator and 33 MB of RAM, it is made up of 5,000 polygons. The modeling time for all of the images was 30 hours; the rendering time was one hour per frame. The celestial head was animated with traditional cel animation techniques.

Working with the same system except with Toaster 3.0 software, *Danbot* (pictured above *Temple*) was designed from a fully articulated robot consisting of 3,000 polygons. The modeling time was 20 hours while each frame was rendered in 15 minutes. The clouds are several layered hemispheres with slightly different color and fractal noise transparency textures.

Daniel L. Smith is a freelance artist based in Sterling, Va.

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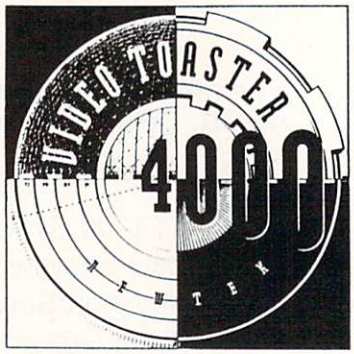

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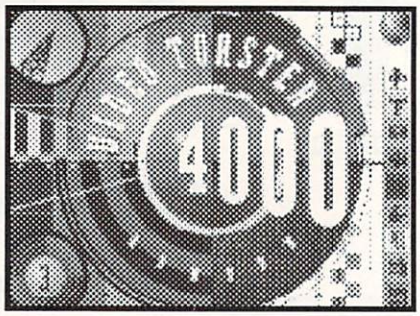

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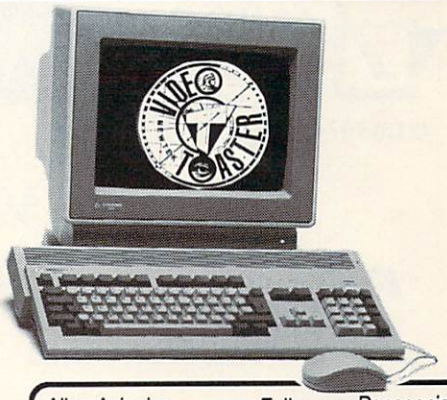

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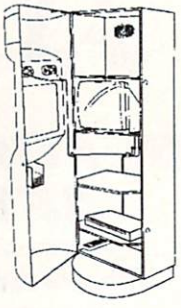

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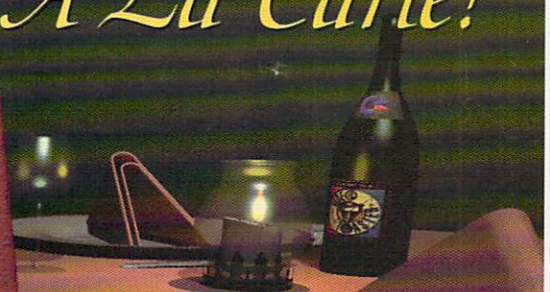

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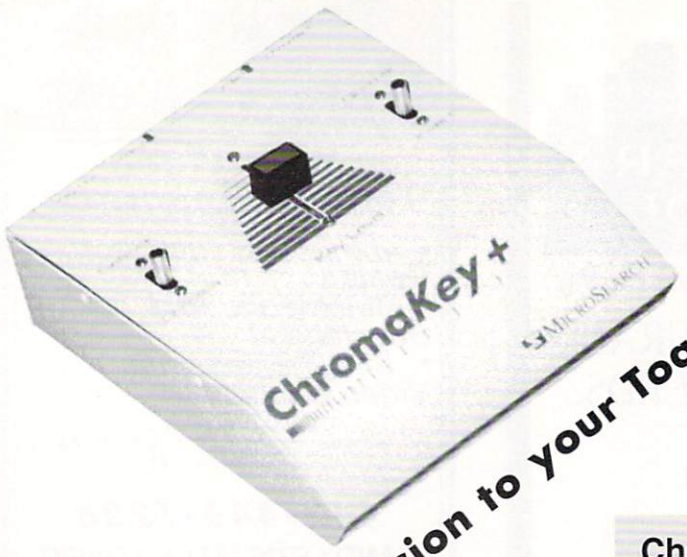

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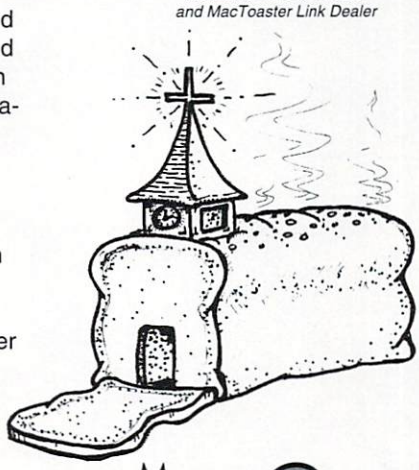

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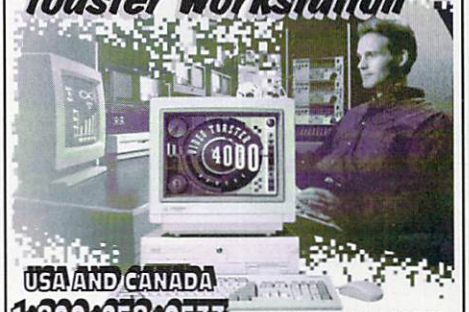

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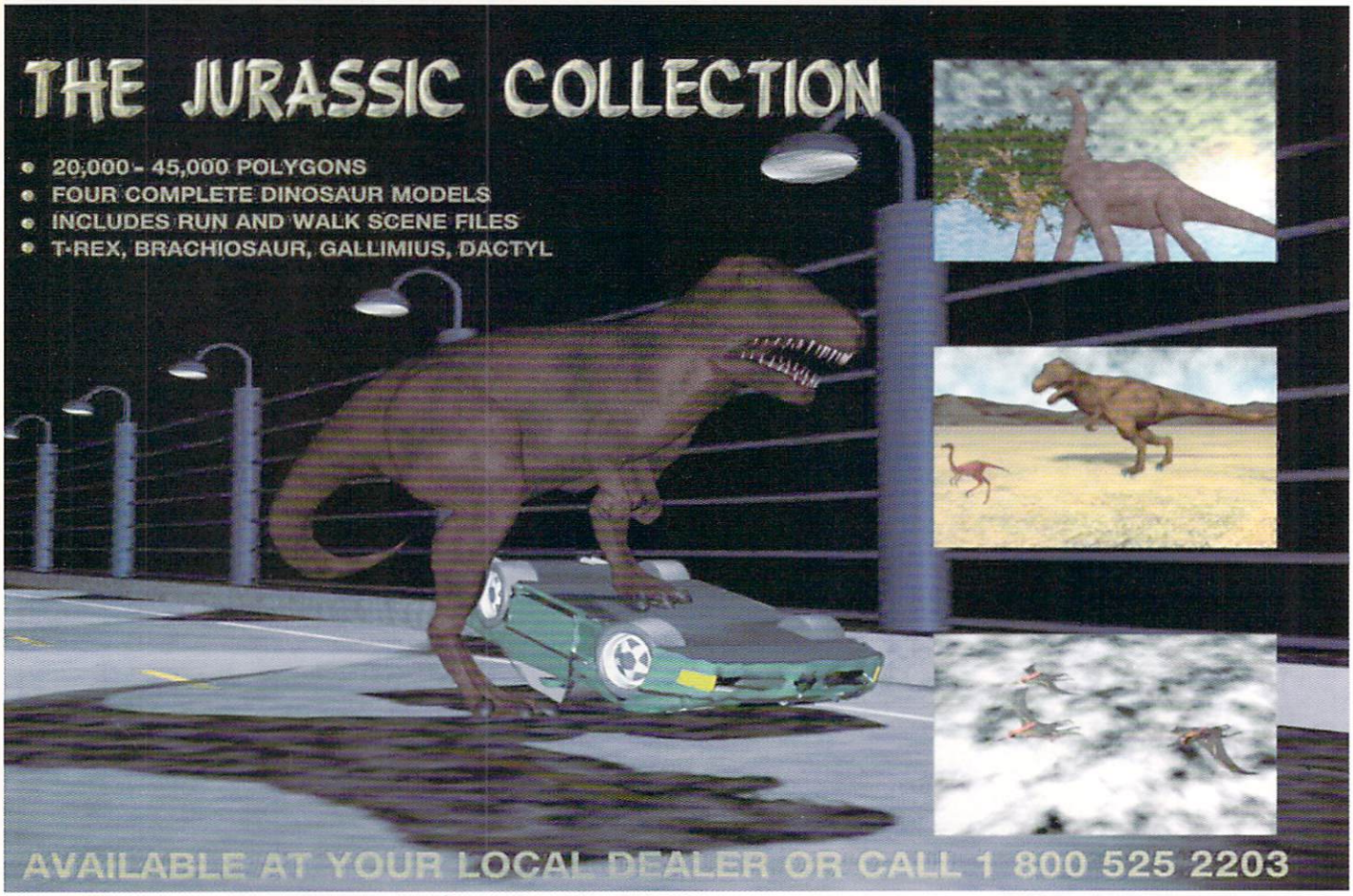

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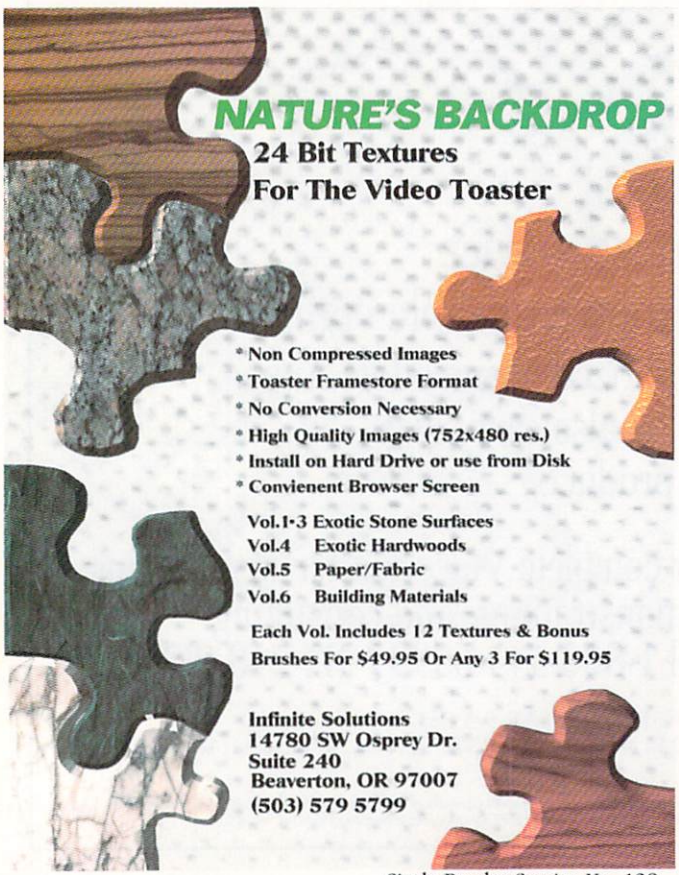

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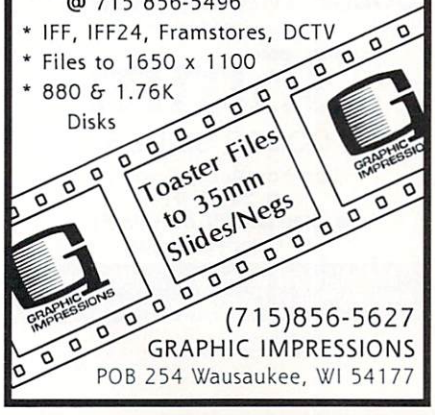

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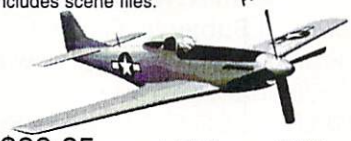

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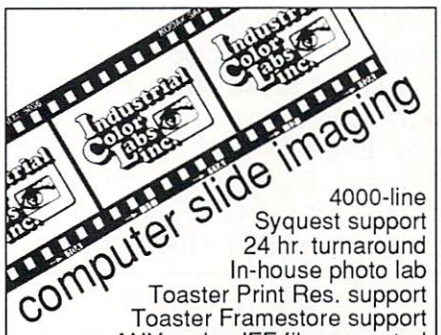

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Meets on the second Friday of the month
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Art Baldwin
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Suffolk Video Club
Attn: William Pinto
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Brentwood, NY 11717-2506
(516) 273-4876
Meets on the second and fourth Thursday of the month (except July and August)

Toasterholics Anonymous
Amato's Pro Video
Tim Ryan
6716 Myrtle Ave.
Glendale, NY 11385
(718) 628-6800
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Toast Posties
Raleigh Area VTU Group
Corey Petree
3012 Highwoods Blvd.
Raleigh, NC 27604

WV Video Toaster Users Group
Destiny Images
Jamie Cope
PO Box 4631
Charleston, WV 25364
(304) 925-4741
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7:00 p.m.

South

A-TUG Border States Amiga Group
Micro-Tronix
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Fort Smith, AR 72901
(501) 782-4048
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9:00 a.m.

Arkansas Toaster Users Group
David Settlemoir
AG&FC Video Productions
2 Natural Resources Dr.
Little Rock, AR 72205
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Meets on the second Thursday of the month
6:00 p.m.

West Tennessee Video Toaster Users Group
Brian Churchill
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Memphis, TN 38133
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Channel Z Toaster User Forum
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Digital Arts Toaster User Forum
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Inland Empire Toaster Users
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San Bernardino, CA 92404
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LA Video Toaster Group
Mark Stross
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Sun Valley, CA 91352
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Meets on the first Sunday of the month at CBS Television City
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Orange County Toaster Users Group
Bruce Gleason
Thumbs Up Video
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Orange, CA 92667
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Meets on the third Thursday of the month
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Sacramento Video Toaster Society
Glen Cornish
Applied Computer Systems
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North Highlands, CA 95660
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(916) 338-2000
BBS:(916) 338-2543
Meets on the third Wednesday of the month
6:30 p.m.

San Diego Video Toaster Users Group
Mike Amron
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San Diego, CA 92123
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Silicon Valley VTU Group
HT Electronics
Andrew Timmons
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Santa Clara, CA 95050
(408) 243-9233
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Professional Video Toaster Forum
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Monte Strohl
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Seattle, WA 98109
(206) 628-2923
Fax (206) 628-4324
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7:00 p.m.

T.U.G. 98XXX
Larry Simpson
Amiga Northwest Studio
6335 NE 159th
Bothell, WA 98011
(206) 488-1129
Meets on the third Thursday of the last month of the quarter

Washington Area User Group
Wade Nelson
Spectral Multi-Media
131 106th Ave. N.E.
Bellevue, WA 98004
(206) 451-4075
Meets on the first Saturday of the month
11:00 a.m.

Canada

B.C. Professional Video Toaster Forum
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Castle Computer Systems
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Canada
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Video Toaster User Group
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Maison du Logiciel
Softwarehouse
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Montreal, Quebec H2E 1W2
Canada
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Fax (514) 722-0627
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7:30-10:30 p.m.

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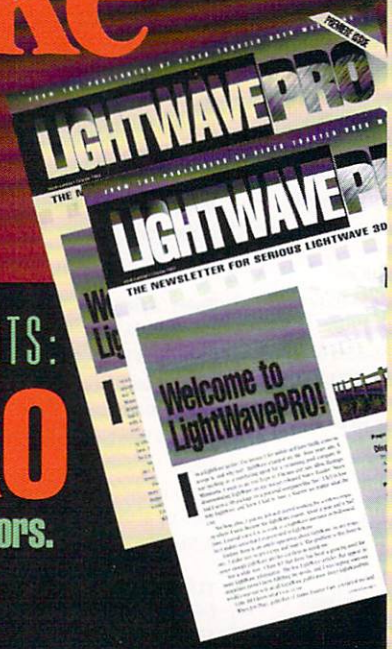

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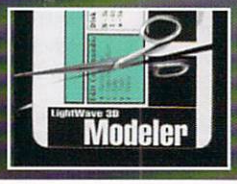

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LAST WORD

A Journeyman's Notes

Assessing the Show Biz Toaster

By Lee Stranahan

My job in this column is to comment on the radical change happening in the world of video. I consider myself an active participant in this revolution, so these columns are in a sense news from the front lines.

There's been a lot of activity lately, so what's our focus this month? How about NewTek's Screamer, NewTek's answer to every LightWave user's prayer. Or, perhaps I should talk about Sony's recent wallet-warping announcement of Betacam SP decks for less than $10,000.

All of these technological achievements represent leaps forward for the personal video producer, but they aren't what's been on my mind lately. Nope, this column's about something that too often gets forgotten when browsing through the technological toy store: content.

You see, if I thought this revolution was only about cool boxes with pretty lights, I'd pack up my card table and go home. The thing about the Toaster that's always been exciting to me is the possibility it has held for changing the face of television. Regular people, like you and me, could actually produce our own TV shows.

Of course, the Toaster has gotten its share of press for its use on shows like *Unsolved Mysteries*, *Babylon 5* and *seaQuest, DSV*.

I'll let you in on a little secret, though—I don't like those shows. Neither do most people I talk to. Take the special effects out, and I'd just as soon watch a Psychic Friends infomercial.

Now, admittedly, my tastes are not everyone's. For instance, I hated *Jurassic Park*. I know, I know, I know—the effects were good; the movie was bad. Nice effects do not make up for the glaring plot holes and the relentless bashing of science and achievement.

Jurassic Park is one of the top grossing films of all time, so I'm clearly in the minority on this. So was the kid who said that the emperor wasn't wearing any clothes. Obviously, popular does not necessarily equal good, but aside from that I didn't hear too many people coming out of *Jurassic Park* raving about the plot, either.

Now, many of my friends accused me of being a spoil sport for bringing up minor things like plot, theme and character development. I don't think I'm asking too much, however. You don't need to look much further than a couple of James Cameron films, such as *Aliens* or *Terminator 2*, to see that good filmmaking and cutting-edge special effects can go hand-in-hand.

Now that we know that I probably won't get invited to Steven Spielberg's house for dinner, let's talk about *seaQuest*. First, I should mention that I am friends with a number of people who work as animators on the show, one of whom is my brother, Ken. Good job, guys—the effects look great. The rest of the show, however—that pesky plot, theme and character development stuff—is another story.

When I watch *seaQuest*, it reminds me of why I bought the Toaster in the first place—because I hate shows like *seaQuest*. The inane dialogue and sugar-coated New Age plot devices (the talking psychic dolphin, the Russian telepaths showing us that the world can live as one, and the ghosts trying to work out their unresolved feelings), give me that "I-can-write-better-scripts-than-this-on-Prozac" feeling I always get when watching bad TV.

Now I credit NewTek for this do-it-yourself attitude, although recent NewTek promotions are a little...well, schizophrenic. For evidence of this diagnosis, you need look no further than NewTek's *Payback Time* video. On the one hand, they complain about "blah, blah, blah television," and boldly (and rather obnoxiously) say, "The networks suck." On the other hand, they can't help showing lots of clips from network TV shows.

Maybe it was just *Payback Time's* strident tone, but the contradiction was glaring. And to be honest, NewTek often seems a lot more interested in hobnobbing with Hollywood than getting feedback from its regular users. That's not surprising—but it's not revolutionary, either.

Am I saying that NewTek should stop showing clips from network shows? No. I think the mistake the *Payback Time* tape makes, though, is significant. To say that the Toaster will bring an end to "blah, blah, blah television" is simply untrue. The Toaster doesn't make television. People make television, and smart people with new ideas can create intelligent interesting programming with whatever equipment they have access to.

What the Toaster does is level the playing field. It puts the tools of television within the reach of more people. However, what people do with those tools is an open question. Give one Toaster to somebody who has few original ideas but some technical skill and you get nice-looking but empty programming. Give them 40 Toasters, and you get *seaQuest*.

The problem is, it's too easy to be seduced by technology. Take it from me, I'm an expert on that subject. It's just too convenient an excuse to be able to say to yourself, "If I just had one more cool box with pretty lights, I could start producing good work." Wrong. You could be producing good work right now.

So, the Toaster hasn't made television better yet. Maybe it's too early in the revolution to have expected that it would have. Or, maybe it's you and me. Maybe television isn't better yet because we haven't made better television programs.

I'll tell you what I'll do. In 1994, I promise to put my money where my mouth is and try to produce something better than most of the stuff on TV. Will I be able to do it? Will I succeed? I don't know, but it will be an honest effort.

So what do I want from you? No, you don't have to like my show, or even watch it. You don't have to agree with me about *seaQuest* or *Jurassic Park*. What I want you to do is be true to yourself. I know you need to make money, and I know you might not have all the equipment and experience you need. Forget all that. Follow your own vision and make your own show, the kind of TV that you'd like to watch.

Obviously, not everyone can just run off and make their own TV show. However, if just a handful of you can—if just a few Toaster users can get back in touch with the magic of television that got them interested in video production in the first place—then it will be the start of the real revolution.

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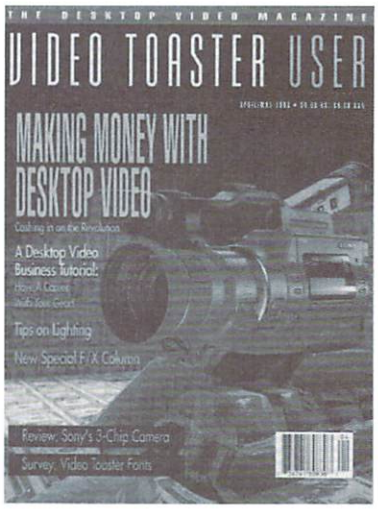

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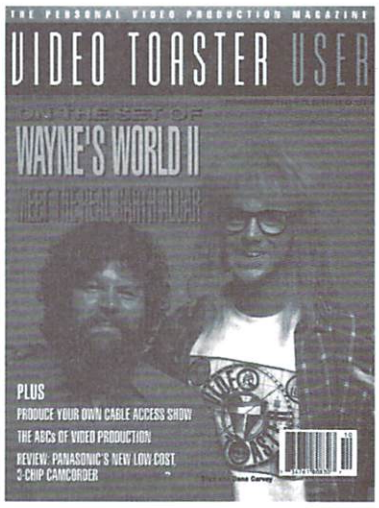

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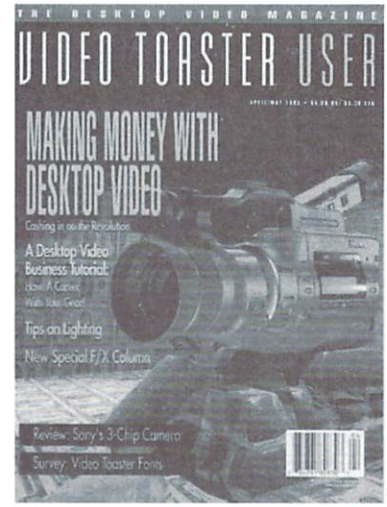

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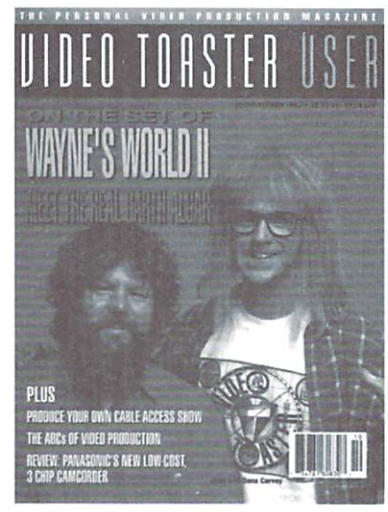

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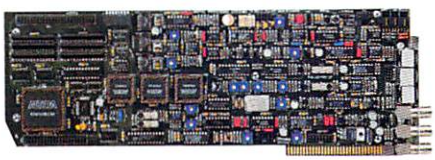

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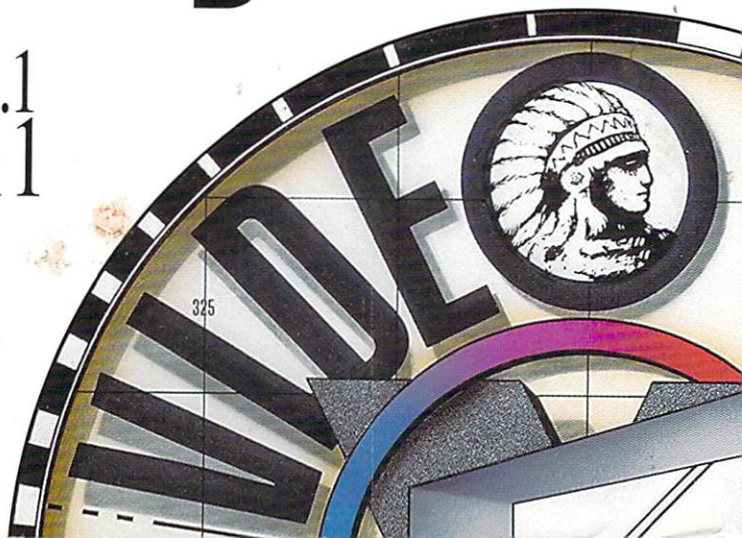
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