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VIDEO TOASTER® USER

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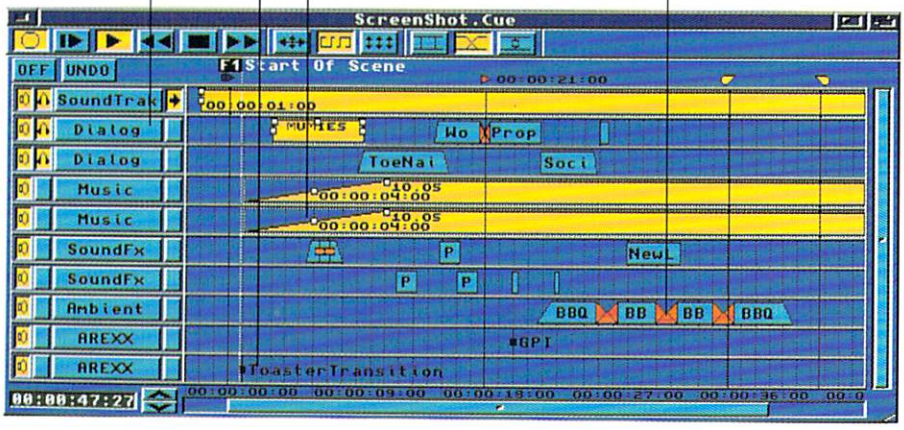

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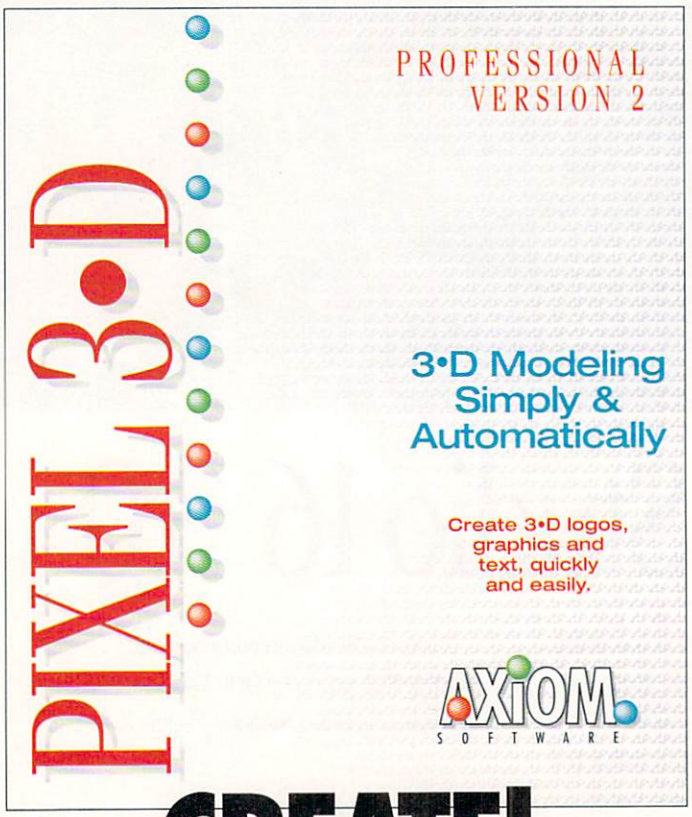

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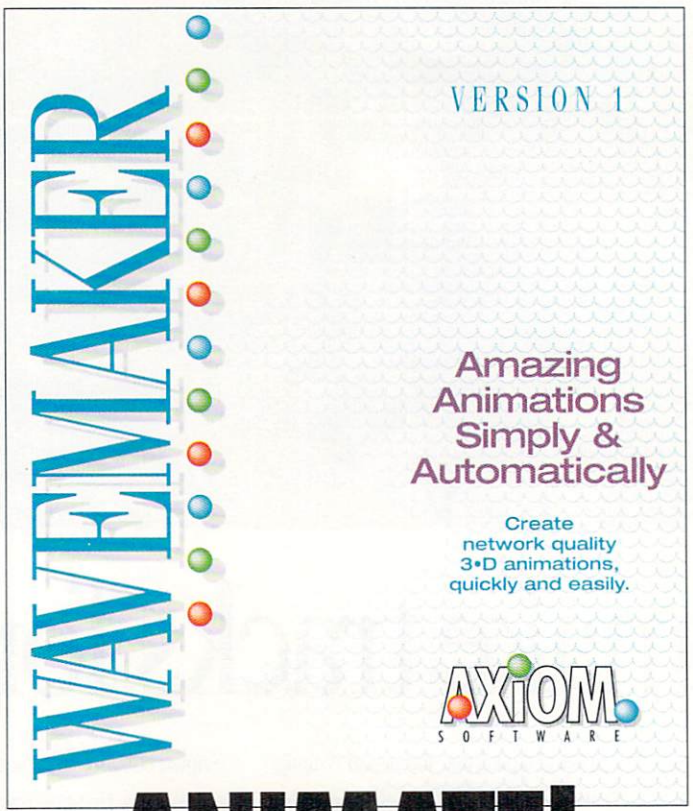

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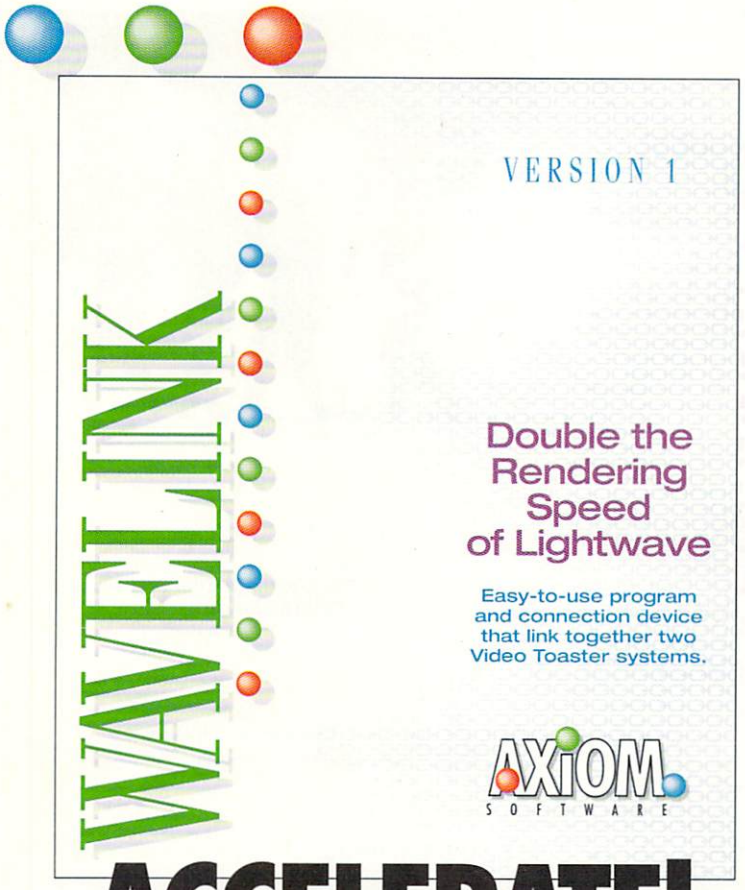

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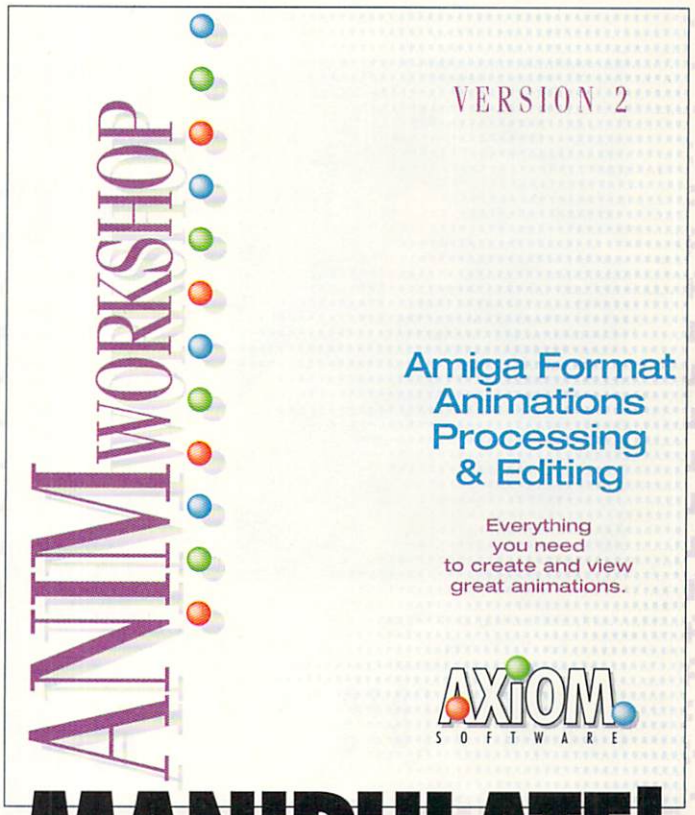

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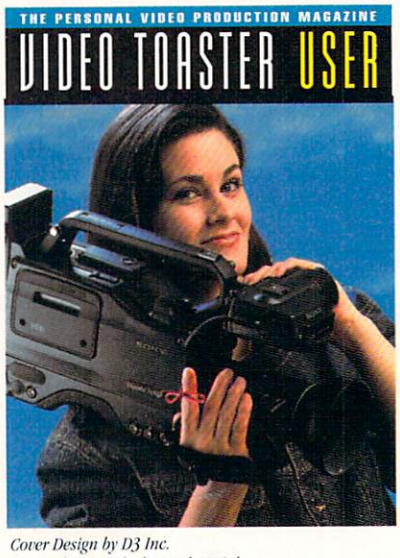

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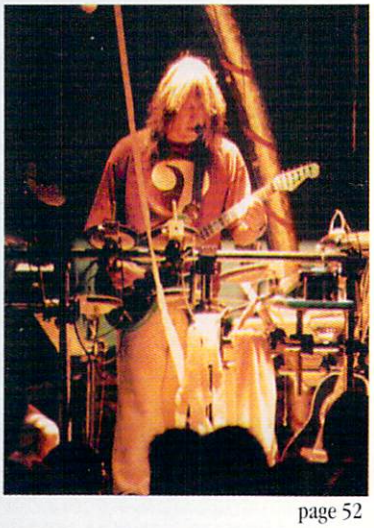
FEATURES



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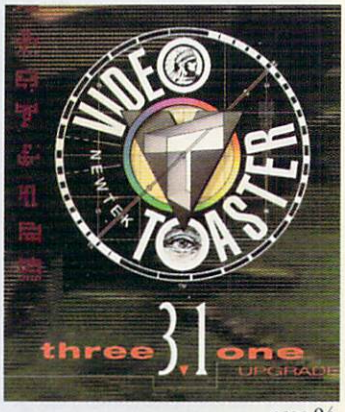

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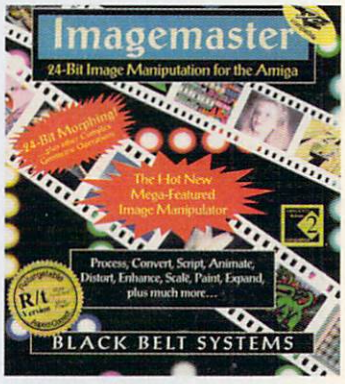

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Suggestions and comments should be sent by written correspondence to: VTU, Letters to the Editor. Be sure to include your name, address and telephone number.

QUESTIONS AND TIPS
Direct your Toaster-specific questions to John Gross. Direct your general video questions to Rick Lehtinen. Send your tips to Brent Malnack.

NEW PRODUCTS & UPDATES (PRESS RELEASES)
Specific product information or press releases should be sent to the Managing Editor by mail or fax (408-774-6783).

WRITING FOR VTU
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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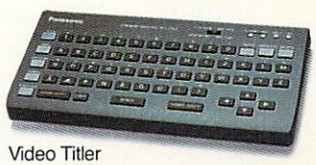

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TOASTER TALK

Hitching a Ride

Going My Way on the Info Highway?

by Phil Kurz

I get a little uneasy when I see Vice President Al Gore standing onstage at UCLA with comedian Lily Tomlin dressed as Ernestine, the "one-ringy-dingy" telephone operator.

If the occasion were a political fund-raiser maybe I wouldn't cringe at the sight. However, because Ms. Tomlin was there in character as part of the introduction to a major policy speech on the future of telecommunications in this country, I get worried, and I think that as users of the most revolutionary device in the history of television production, you should get a little nervous, too.

AP BY ERIC DRAPER

Vice President Al Gore and actress Lily Tomlin onstage at UCLA.

Speaking before an audience of representatives from the television, computer, telephone, and entertainment industries, Gore discussed the administration's vision for a $100 billion to $200 billion broadband telecommunications network commonly referred to as the information superhighway that will serve this country well into the 21st century.

The vice president outlined a plan that ostensibly removes federal laws and regulations to encourage competition among local telephone companies, cable television system operators, long distance telephone services and even electric utilities to carry video, voice and data services.

This should sound great to independent video producers seeking new outlets for their product. More channel capacity means more channels to fill. More channels to fill means more video production work, right? Well, maybe, but perhaps there's a weightier issue here that is going unaddressed.

In our rush to capitalize on this new market, let's not lose sight of the fact that the same federal government that is proposing legislation to ease legal and regulatory barriers to competition in the telecommunications industry also seeks to curtail First Amendment rights of free speech by whipping the television and motion picture industries into submission in the area of TV violence.

This incongruity demands our attention because the Clinton administration cannot have it both ways. How can they position themselves in the public eye to be advocates of deregulation of the telecommunications industry—an action that appears on the surface to promote the free exchange of information and ideas—and have their minions work in Congress to chip further away at the constitutionally guaranteed right to free speech? What are the administration's true colors?

Entrenched Interest and the Toaster Revolution

As users of the Video Toaster, many of you have bought into the dream of a communications revolution with your treasure, toil, time and tears. Many of you know firsthand about the pleasures of shooting video of tipsy wedding reception goers, editing till the sun comes up and it's time to go to your day job, working for clients who don't understand the consequences on your bottom line when you press the render button and they change their minds. Why do you do it?

Sure, it's a living, but many of you aspire to much more. You view these challenges as part of the journey toward your ultimate goal: producing your own professional television show. To achieve your dream, you are willing to give up your weekends with your kids and take a second mortgage on the house to pay for your Toaster system and camera. You're willing to attend the video school of hard knocks because you realize that it is through doing that you improve and define your talents and vision for your dream.

And almost as if the Fates smiled upon you personally, the number of television outlets, such as those offered by direct broadcast satellite, cable, data superhighway and the rest, grew exponentially. But what good is it to you if the same old forces that have controlled the media in this country play traffic cop on the information superhighway?

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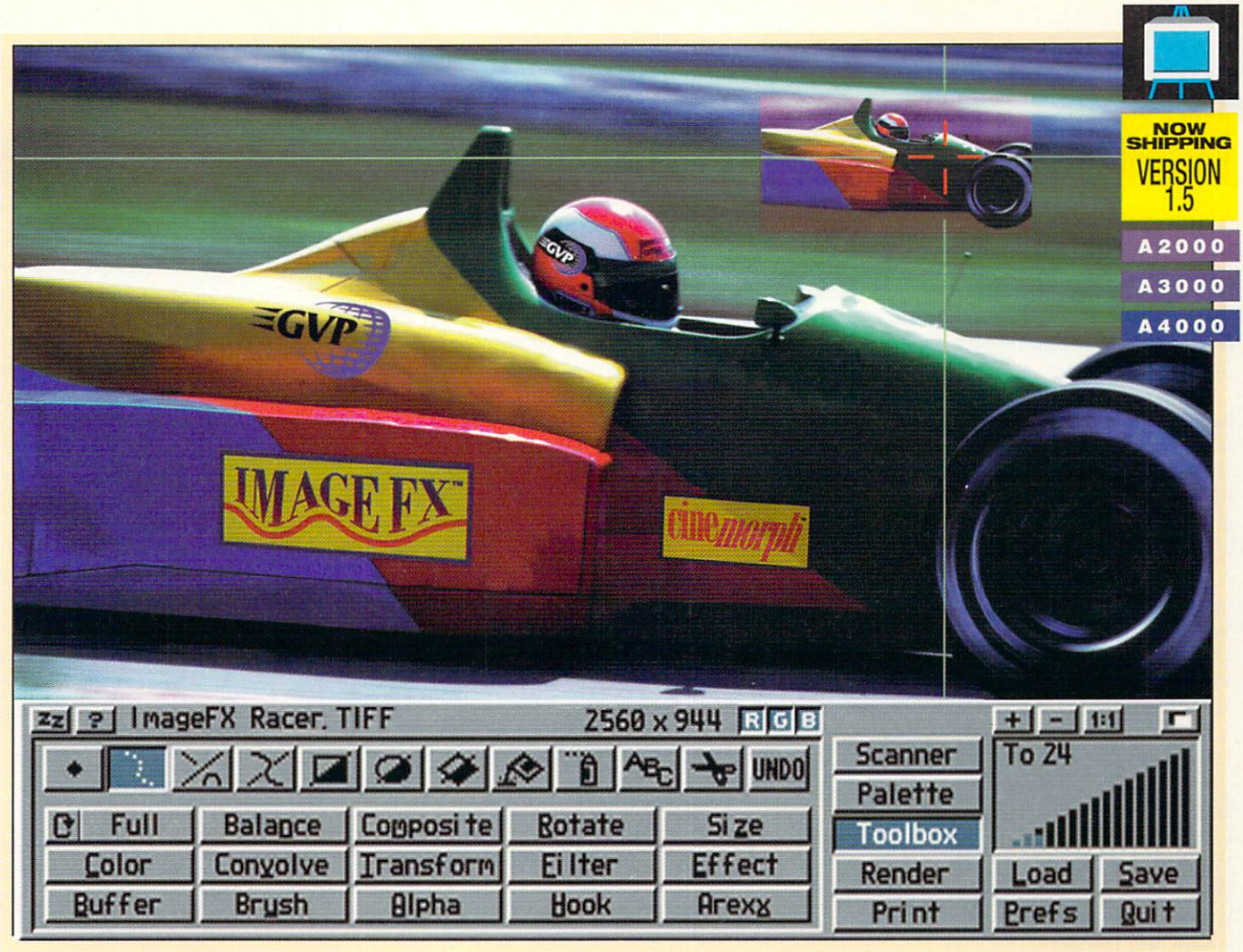

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Perhaps other Image Processing packages will someday catch on to the power and flexibility of **ImageFX**. However, if you're serious *now* about Image Processing, you need the software that was *born* ready. No limitations. No costly additions!

You **still** want more? OK! With **ToasterFX**™ from Byrd's Eye Software, you now can integrate the power of **ImageFX**™ with your **Video Toaster**™.

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LETTERS TO THE EDITOR

Dear VTU:

In your August/September 1993 issue, you state that Joel Tessler did the post-game editing for the Miami Dolphins football team.

This is incorrect. Mr. Tessler is not now and has never been on the Dolphins staff. Further, he has no involvement with the game tapes or any other internal team activity.

Mr. Tessler is a game-day only stadium employee.

Sincerely,
David Hack
Video Director
Miami Dolphins

Dear VTU:

I was happy to see your article, "Toaster Animation Output Options," in the January 1994 issue of *VTU*. But I must say, I am extremely surprised that the article completely overlooked a very common and certainly high-profile method used by Toaster animators to record their work to video: ASDG's Abekas Driver.

Having sent you press releases and having talked with you at length about this subject, I'm certain that you are aware that high-profile Toaster works such as *seaQuest DSV* and *Babylon 5* use ASDG's Abekas Driver in conjunction with ADPro to convert massive streams of Toaster framestores into D1 Digital Video.

Additionally, you know that ASDG's Abekas Driver offers color correction capabilities not found anywhere else which were essential in the creation of *seaQuest DSV*.

Considering the relatively low cost, the unmatched quality, the platform independence (our driver is available for Amiga, SGI, Windows and Macintosh) and the fact that our solution also solves two other key problems (input of massive streams of video and also backing up massive amounts of information), leaving out a discussion of our product is a very serious omission to an otherwise informative article.

I do hope that you will take every step to address this omission as quickly as possible as not to do so would be a disservice to your readers. I know that Matt Drabick is an excellent author, and would be happy to discuss this with him if he desires.

Sincerely,
Perry S. Kivolowitz
President of ASDG Inc.

Editor responds:

It seems that great minds must work alike. Would you believe that we have a companion article devoted specifically to using the Exabyte drive, the Abekas digital disk recorder and ASDG's driver scheduled to run in the April issue? Thanks for your interest, but rest assured we have this subject covered.

Dear VTU:

I read with amusement your January article on the new Beta SP VTRs and thought I should share with you and much of the rest of the video world a video secret I have been using for more than five years!

Either from ignorance or arrogance, the great majority of video users are not aware of MII, a product which has always blown the socks off Beta in quality, features and price.

From day one, MII has had a superior video signal to Beta. As proof of this, Sony came out with Beta SP to compete with the MII quality. Then, Sony came out with an industrial line to compete with MII pricing, but to do so eliminated such features as hi-fi audio and lowered their own video specifications of the recorded signal, which has been lowered again with this new product. MII has always had a 90-minute field recording capability, and only when Sony introduced the BVU 50 did they catch up with MII in this area.

To put it in one sentence, MII has always been one-inch quality at industrial prices.

In addition, I have had my video heads give me more than 3,000 hours of recording life and Beta heads are only supposed to last 1,000 hours.

It was refreshing to see an awareness of MII in the review of Y/C++, but the mention of MII is far too infrequent for any journal dealing with video. We need to let video users know of *all* the available tools out there!

For those wishing further information on what is the best quality video bang for the buck, they may contact something else the Beta folks don't have, the MII Users Association, at: 1950 Roland Clarke Place, Ste. 100, Reston, VA 22091. Phone number: (703) 620-6000.

By the way, I am impressed with the quality information in your magazine.

Sincerely,
David L. Andrews
Salt Lake City

Editor responds:

Thank you for your letter. I appreciate your enthusiasm for MII. However, I must disagree with one of your assertions. MII does not provide "one-inch quality at industrial prices." It's generally accepted that MII is good down to six generations. One inch, which is a direct color recording system, is good to 10 generations. Nevertheless, MII does provide video producers with beautiful video and has provided those desiring analog component video with an alternative to the Beta SP.

For those of you who are interested in MII, the users association will be sponsoring a meeting at the National Association of Broadcasters convention in Las Vegas, Tuesday, March 22 at the Riviera Hotel. So far, a time hasn't been set for the meeting. For more information call the association at (800) 966-1030.

Correction:

In New Updates of the New Products department in the January 1994 issue of *VTU*, an incorrect retail price was listed for SunRize Industries' Studio 16 Version 3.0. The correct price is $249.

Sound Off!

Have a question, comment or observation about something you've read or any video related subject? We want to hear from you. Send your correspondence to:

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Provide your name, company and title, address and telephone number. We will edit your letter for length and clarity.

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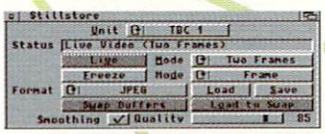

Plus – Complete Amiga Software Control and ARexx™ Interface that allows seamless integration of all **TBCPlus** features into an exisiting automated video studio installation.

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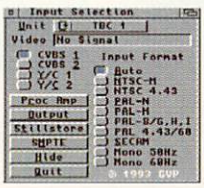
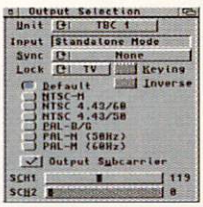


Plus – Convert the 2–composite inputs into a single Y/C input, providing two switchable Y/C inputs.

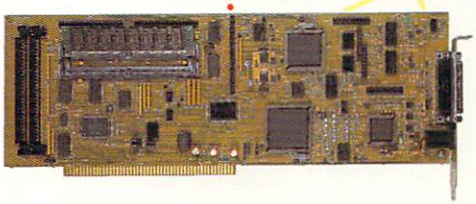


Plus – Full SMPTE/EBU encoding/decoding/striping available as an option.

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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ON TOASTER 2.0, 3.0 AND THE NEW TOASTER 4000

Look for the Stranahan Brothers' LightWave Tour coming to 11 U.S. cities this spring and summer!

(see advertisment in this issue)

TWO-DAY SEMINARS WILL BE OFFERED IN THE FOLLOW LOCATIONS IN MARCH 1994:

MESA, AZ
SAN FRANCISCO, CA
LAS VEGAS, NV
(Thurs. & Fri. after NAB)

Just listen to what past attendees have had to say about Toaster Training:

"Excellent! Very well orchestrated!"
- R.V., St. Louis

"Excellent workshop! Lee is a great teacher and certainaly knows his stuff!"
- S.B., Toronto

"Lee makes understanding complex ideas easy. Great job!"
- A.P., Orlando

"Very informative and entertaining. Lee was outstanding!"
- B.K., Chicago

"Excellent content, very understandable, the seminar was well planned and the information was presented clearly."
- C.H., Washington D.C.

"If anyone that owns a Toaster has not attended a (Stranahan) seminar, they don't know what they're missing. The two days were great!"
- R.M., New Orleans

"The David Letterman of Toaster Training!"
- M.D., Philadelphia

Lee Stranahan could easily be called the "World's Smartest Toaster Guy." Shortly after purchasing one of the first Video Toasters, Lee quit his day job and, with his wife's endorsement, took on the task of learning the Toaster inside and out. Along the way he started the first Toaster User Group and, Bread Box, the first Toaster newsletter (Bread Box became Video Toaster User.) His knowledge of the Toaster became so extensive that NewTek asked him to write the tutorials for the Toaster 2.0 manual. He is the author of "101 Toaster Tricks" and the host of the successful *Desktop Images* series of Toaster training videotapes. Lee could also be called the "Most Traveled Toaster Guy" as he has criss-crossed the country to present his Toaster workshops to thousands of satisfied Toaster users.

COURSE DESCRIPTIONS

DAY 1 TOASTER ESSENTIALS:

Our Toaster Essentials seminar will teach you how to use your Toaster to supercharge your video productions. This is a brand-new version of the class that has wowed thousands of Toaster users. In Toaster Essentials, you'll learn timesaving tips and mind-blowing techniques for the Switcher, CG, ToasterPaint and ChromaFX. This course does not assume that you own a lot of expensive video gear, nor does it assume that you are a computer wizard. You'll be truly amazed at just how much can be squeezed out of a basic Toaster setup, and how quickly you can become a Toaster expert. This class also features an extensive Q&A session with the "World's Smartest Toaster Guy."

DAY 2 LIGHTWAVE & MODELER ESSENTIALS:

Whether you are a beginner who's been intimidated by LightWave, or a user who's just having trouble getting that broadcast look, this is the class for you. More than just fancy techniques, this class also shows you the right method for creating 3D graphics quickly and easily. You'll learn the right way to set up scenes, tricks for cutting rendering times, and insights on sometimes confusing topics like modeling, lighting, morphing and motion paths. LightWave & Modeler Essentials cuts through the noise of confusing terminology and focuses on what you need to know to effectively use 3D in real-world video productions.

- Learn the latest techniques that let you compete with studios which have more expensive and sophisticated video equipment.
- Unlock all of the power of the Video Toaster™—take advantage of tips and tricks from the "World's Smartest Toaster Guy" that you won't find anyplace else.
- Get all of your Video Toaster questions answered (see our Money Back Guarantee below).
- Gain valuable information on what equipment and software to buy and learn strategies for upgrading your Toaster system.
- Have fun! Lee Stranahan's unique blend of knowledge and humor will make this the most enjoyable learning experience you've ever had.

FREE!

ALL SEMINAR ATTENDEES RECEIVE OVER 40 PAGES OF WRITTEN COURSE MATERIALS AND COOL SOFTWARE!

Both Days ONLY $249.00
One Day for $149.00
To Register CALL:
1-800-322-2843

VISA MasterCard

OUR GUARANTEE: We promise to answer all your Video Toaster questions or we'll refund the entire workshop fee.

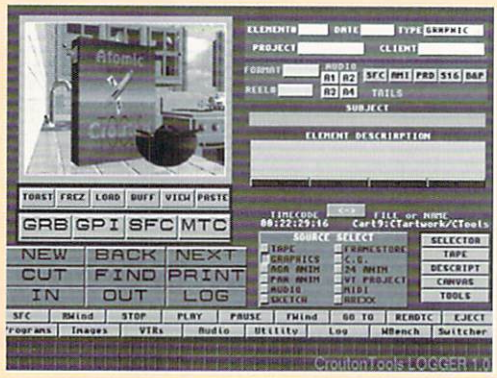
NEW PRODUCTS

Compiled by Douglas Carey

Crouton Tools 4000

Video Toaster Control Interface

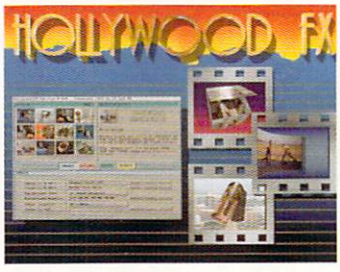
Product: CroutonTools 4000
Description: Video Toaster control interface
Price: $141.95
DevWare Video
12520 Kirkham Court, Ste. 1
Poway, CA 92604
(619) 679-2826
Fax (619) 679-2887
Circle Reader Service No. 1



DevWare's *CroutonTools 4000* enables users to control the Toaster and all auxiliary software and hardware from one convenient, easy-to-use interface. Pre- and post-production is improved and simplified with CroutonTools, which has the ability to find and open more than 60 Toaster programs instantly. With its visual-based logging system, tasks such as loading graphic elements directly from CTLogger to the Toaster are done in seconds. Featuring 1,100 different video tools, CroutonTools serves as a complete production control environment.

Hooray for Hollywood

Product: Hollywood FX
Description: 3D effects for videos and interactive productions
Price: $499
Synergy Software, Inc.
77 West 200 S., Ste. 240
Salt Lake City, UT 84101
(801) 532-0604
Fax (801) 532-5371
Circle Reader Service No. 2



Synergy Software Inc. announces the release of *Hollywood FX,* which creates 3D effects for videos and interactive productions and gives the user the opportunity to select individual images or captured sequences in an effect. To key with video, simply use one of the predesigned backgrounds, your own images or set the background. Crumpled paper, quad-split and dozens of other high-resolution 3D effects are available. Among the features offered are complete control over all rendering options, batch rendering, fly-out, fly-in, A/B transitions and running video effects. Hollywood FX supports Digital Processing Systems' Personal Animation Recorder for easy access and storage of images.

Video Passport

Product: Passport 4000
Description: An all-digital converter that incorporates time base correction and synchronization
Price: $6,800
Prime Image
19943 Via Escuela
Saratoga, CA 95070
(408) 867-6519
Fax (408) 926-7294
Circle Reader Service No. 3

Prime Image's latest desktop video product for use with the Amiga 4000 computer and the Video Toaster is the *Passport 4000,* an all-digital, multipurpose standards converter that also incorporates time base correction and synchronization. The unit is completely self-contained, self-powered and provides expansion slots for the Amiga 4000. Inputs include PAL, PAL-N and SECAM with outputs to PAL and PAL-N (program and optional preview). The Passport 4000 operates with more than six fields of memory per channel and uses Prime Image's "pass through" interpolation technique, ensuring that integrity of all video signal characteristics is maintained throughout the conversion process. Options include two aditional input channels (four total); U-Matic DUB input for Hi and Lo Band; three-way adaptive comb filter and preview output.

News at 11

Product: U-EDIT
Description: A news and video magazine edit controller
Price: $1,995
Editing Technologies Corp.
11992 Challenger Ct.
Moorpark, CA 93021
(805) 529-7074
Fax (805) 529-6744
Circle Reader Service No. 4

Based on the PC platform, *U-EDIT* is a news and video magazine edit controller that converts a user supplied 286 or better into a frame-accurate, 999-event editor. Designed primarily for editing where time is of the utmost importance, U-EDIT's essential edit controls have been reduced to a single keystroke. A special feature called Time Code Jump Mode has been incorporated to alleviate the problems that arise when using time-of-day time code.

Editing Technologies Corp. Inc., has also released the *Follow Spot,* an external wipe position controller for use with switchers that adhere to the GVG-100/200/300 protocols. Follow Spot can be programmed to keep a wipe position on a moving target synchronized to the time code on a source tape.

Performance Enhancer

Product: The Performance Series II
Description: Accelerator for the Amiga 1200
Price: $749 for a 50MHz 68030; $599 for a 40MHz version
Great Valley Products

657 Clark Ave.
King of Prussia, PA 19406
(610) 337-8770
Fax (610) 337-9922
Circle Reader Service No. 5

The A1230 Turbo+ *Performance Series II* pushes the Amiga 1200's performance to the maximum with a 50MHz 68030 (a 40MHz version is also available). The capability can be maximized with the socket for a math coprocessor (68882), which provides room for up to 32 MB of RAM.

With the addition of the DMA Peripheral Port (DPP), the A1200 and the A1230 user can add feature modules for added capabilities such as the SCSI-II, 16-bit Stereo Sound and Real-Time Video Digitizing.

The A1230-Turbo+ Accelerator with the GVP add-on modules is the A1200 users' gateway to features never thought possible in the physically small A1200.

Music to Your Ears

Product: The Music Bakery
Description: Musical selections for use in video productions and A/V-mutimedia presentations
Price: $48 each disc
The Music Bakery
7134-A Campbell Rd., No. 1
Dallas, TX 75248
(800) 229-0313
Fax (214) 414-3160
Circle Reader Service No. 6

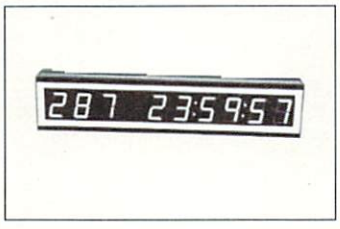
The Music Bakery serves up fresh music of the highest professional quality and features live instruments and award-winning compositions for video productions and A/V-multimedia presentations.

Subscribers receive a new CD every other month for the one-time buyout price of $48 each. Each CD contains a wide variety of musical styles in full lengths (about four minutes), 60 seconds, 30 seconds and tags. Fifteen CDs are currently available, and a catalog containing a complete description of every cut on every back issue is included with a user's first CD. The Music Bakery offers a no-risk free-trial offer and a money-back guarantee on every issue. Users can cancel at any time and still retain their license.

Timing Is Everything

Product: ES-272A/9
Description: IRIG-B time code reader/display of time and Julian date
Price: $1,395
ESE
142 Sierra St.
El Segundo, CA 90245
(310) 322-2136
Fax (310) 322-8127
Circle Reader Service No. 7

ESE announces the *ES-272A-/9*, a time code reader/display



of Julian date and time. The ES-272A/9 is set up to read IRIG-B code, and all codes (including IRIG-A, C, D, E, H, H, CS; NASA 28, 36; 2137; XR-3 and MILA) are available upon request. All nine LED displays are 2.3 inches high and viewable at 75 feet.

Window Shopping

Product: LEADVIEW 3.0 for Windows
Description: Image management software offers compression, photo album, communications, edit, paint, capture and slide show
Price: $99
LEAD Technologies, Inc.
8701 Mallard Creek Rd.
Charlotte, NC 28262
(704) 549-5532
Fax (704) 548-8161
Circle Reader Service No. 8

LEAD Technologies introduces *LEADVIEW 3.0 for Windows*, a comprehensive image management application for end users and imaging professionals. The comprehensive tool offers nine image-related functions, including compression, communications, conversion, image enhancement, paint, screen grab/slide show, and scanning.

All features are integrated into one easy-to-use interface which takes advantage of the familiar Windows smart icons, tool bars, status bars and drag-and-drop capabilities.

Go Speed Racer!

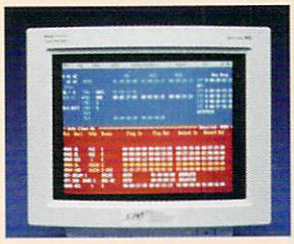
Product: A4000 GForce040
Description: GVP's fastest accelerator ever
Price: $1,899
Great Valley Products
657 Clark Ave.
King Of Prussia, PA 19406
(610) 337-8770
Fax (610) 337-9922
Circle Reader Service No. 9

Great Valley Products' fastest accelerator ever is the *A4000 GForce040*, which uses a 40MHz Motorola 68040 processor and provides up to 128 MB of 32-bit fast RAM. Designed for modular expansion, the GForce040 pushes both the Amiga 4000 and the Amiga 3000 to the edge of its abilities.

Using the latest in integration and surface mount technology, the accelerator has been designed to function in both the current Amiga 4000 and 4000T computers and also the older Amiga 3000 and 3000T.

The main accelerator board holds up to 32 MB of RAM, and an additional RAM daughterboard holds up to 96 MB of additional RAM, for a total of 128 MB of locally accessible RAM.

New Update



Mark It Down

Product: Session Logger function for the Ensemble Pro Version 2.1
Description: Facilitates billing and time usage tracking of the edit bay.
Editing Tech. Corp.
11992 Challenger Ct.
Moorpark, CA 93021
(805) 529-7074
Fax (805) 529-6744
Circle Reader Service No. 10

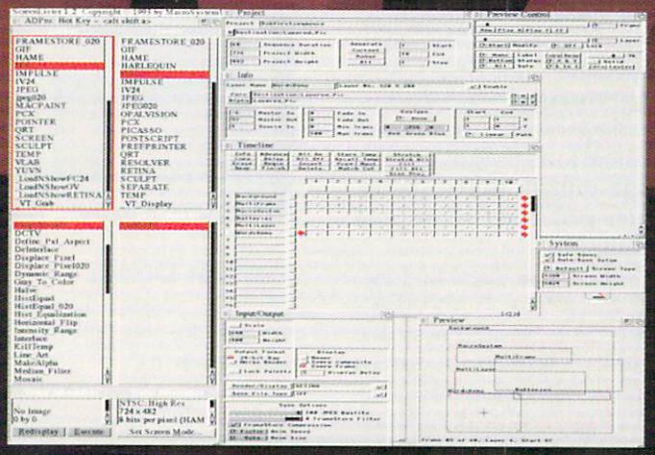
Ensemble Pro's new *Session Logger* function is designed to facilitate billing and time usage tracking of the edit bay. The user can log start and stop times of each edit session, individual pieces of equipment, personnel usage, breaks and down time. With this addition, the TBCs on D2, D3 and digital Betacam can now be controlled directly from Ensemble Pro without the use of an external TBC controller. Download and upload of TBC values are automatic.

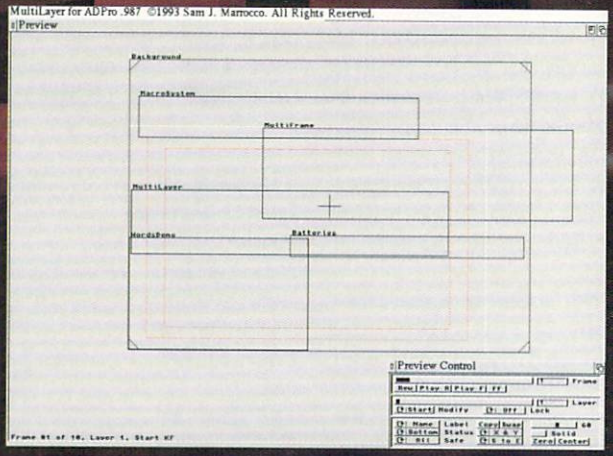
Product Announcements

Send your new product announcements to:
Video Toaster User
Attn: New Products
273 N. Mathilda Ave.
Sunnyvale, CA 94086

The Next Wave of Video Tools for your Toaster System

MultiLayer – *Digital Layering*





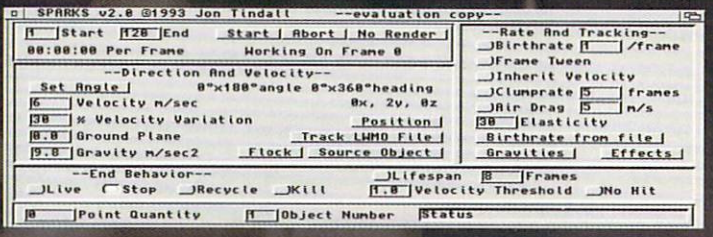
MultiLayer for ADPro is a compositing/layering tool for video professionals & artists using ASDG's ADPro program as a compositing engine. MultiLayer will also be available for ImageFX with the same abilities listed here.MultiLayer improves upon ADPro's already impressive array of compositing functions 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
Recommended: Amiga with 030/040, 16Meg of Fast Ram, 500MB HD, Retina
MultiLayer-IMFX requires ImageFX 1.5 and Workbench 2.1

The tool LightWave users have been waiting for!



Particle Animation "SPARKS" Standard Particle and Real World Kinematic Animation System.

The first Particle Animation system for LightWave3D 3.0

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.

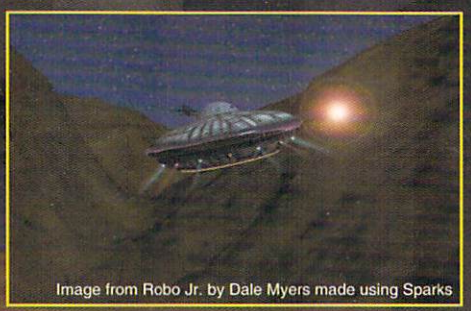


Image from Robo Jr. by Dale Myers made using Sparks

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
- Elasticity and Mass
- End Behavior - stop, recycle, kill-
- Direction - interactive GUI
- Source and Target positions - set start positions by a models vertices
- Sprays, Streams, Fountains
- 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 for use with the Video Toaster System.

RETINA Z-III™

Upgrade available for current Retina owners!

The Best has just gotten better!

Full 32bit Zorro III, Higher Resolutions, The Fastest Yet!
In an A3000 or A4000 the Retina Z-III is unbeatable for use with TVPaint and Rendering software.
Built-in Video Encoder with Composite and S-Video Outputs. 1280x1024 24bit Res.

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
- Uses 2 to 4 Megabytes, user-upgradable.
- 4MB allows large 24 bit screens for complex Graphics.
- Includes free 8, 16 and 24 bit animation creation and playback software with Double Buffering.
- High Speed 32Bit Bus to Video Memory running at 60MHz with 100MB/sec Data Transfer Rate.
- Hardware drawing assist functions to accelerate GUI Operations - 64Bit data latch and BLT structure.
- RetinaEMU Workbench and Custom Screen Display Emulation.
- Display 24 bit Images or Animations on a 24 bit depth Workbench Screen.
- Programmable Retina display modes.
- Independent program resolution assignments!
- Compatible with the Video Toaster, OpalVision and the VLab™ Real-Time Video Digitizer.
- Requires AmigaDos 2.0 or greater.
- Full one Year warranty.
- Optional External Video Encoder with Composite and S-Video outputs available for the Retina.
- 1084/Composite Sync Adaptor available for the Retina.

TVPaint 2.0 Professional

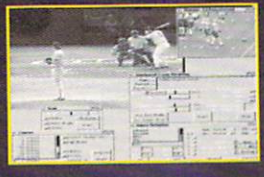
The State of the Art in 32 bit Painting for the Amiga.
TVPaint is the fastest 32 bit Paint Package available for the Amiga.

Some of TVPaints features: Automatic Antialiasing on drawing tools, Powerful Airbrush tools, Density control on tools, Full Undo/Redo, Spare/Swap screens, Convolution Effects, Definable Magnification Window, Custom Masks, Pressure Sensitive Tablet support, Full CLT.

TVPaint 2.0 - Suggested List $349.95

VLab Y/C™

Digitize 30fps Video from Video Tape or Laser Disk



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 digitizes the frames directly to HardDisk as sequentially numbered frames.

Hardware Features:

- Frame grab in 1/30th sec. or Field grab in 1/60th sec.
- Digitize 30fps Video using IFR
- Digitizes full frame full color - NTSC or PAL signals.
- Save frames as YUV, IFF24, AGA
- VLab Y/C -1 Y/C & 2 Composite inputs.
- VLab &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.
- Includes ADPro and ImageFX Loader modules.
- Supported by the Nucleas Personal SFC.

Toccata 16™

16bit/48KHz Audio Digitizer - 3 Stereo Inputs with Mixer

The Toccata is a full 16bit audio digitizer with 3 Stereo inputs, 1 Mic input and 1 Stereo output. The Toccata will work in any ZorroII or ZorroIII slot. The Toccata can digitize at up to 48KHz in 16bit direct to hard disk. Special features are an onboard mixer and optional ADPCM compression. The ADPCM compression allows digitizing at 32KHz directly to a floppy disk and playback from floppy. Playback from HardDisk can be up to 16 channels in 16bit. The Toccata can also be used with the VLab IFR to digitize the audio for a video sequence. Simultaneous Record and Playback from HardDrive. The Toccata comes with a special version of SEKD's award-winning audio editing software package, Samplitude.

Technical Specifications:

- 3 Stereo (6 Channels) Inputs
- 1 MicroPhone Input
- 1 Stereo (2 Channels) Output
- On board mixer
- Record and Playback Simultaneously
- Reads Audio SMPTE Time Code
- 64 Times Oversampling
- 16 different sampling rates
- Frequency Response 10Hz to 20KHz
- 90db Signal to noise ratio
- Dual 16bit delta-sigma A/D converters
- Dual 16bit delta-sigma D/A converters

Suggested List Price ..$599.95

MacroSystemUS™

24282 Lynwood, Suite 101 Novi, MI 48374 (313) 347-6266 Phone (313) 347-6643 Fax

Circle Reader Service No. 132

TOASTER TIMES

Shasta Kicks off Animated Advertising Campaign

Josh Moscov

Santa Maria, Calif.-based Computer Cafe has served up a special 12-pack of dancing, LightWave Shasta cans for the first television advertising campaign from the soft drink company in 12 years.

It also marks the debut of animation in a Shasta television promotion.

Football fans were the first viewers of the 15-second spot that aired nationally on December 30, 1993 during the Freedom Bowl. They were treated to a scene inside a refrigerator of various Diet Shasta cans partaking in festivity: Individual cans were seen juggling grapes and limboing under a straw. Near the end, a Coca-Cola is kicked around by two members of the Diet Shasta team, making the entire promotion quite appropriate for a football fan's halftime relief.

An extended, 30-second spot has been airing since late January on the West Coast and a Computer Cafe spokesperson said that plans are underway to take the advertisement national later in the year. In addition, Shasta will tack a Toaster image of a female can wearing sunglasses on billboards.

Diet Shasta cans modeled with LightWave's Bones feature whoop it up during a 15-second advertisement that entertained Freedom Bowl fans. A 30-second spot has been airing as well.

LightWave's Bones feature enabled Computer Cafe to give the cans the kind of bending and movement that Shasta was looking for, according to Cafe creative director Jeff Barnes. "The sling-shot scene couldn't have been done without Bones. The cans and rubber band were modeled as one object so that the tension could be correctly distributed throughout the move," he said.

Further in the production process, Computer Cafe scanned the can images with an Epson-600C and cleaned up the maps with Brilliance. OpalPaint was used for the fruit textures and real-time image balancing. An RCS X-Calibur accelerator board assisted in rendering the images on a Toaster 4000.

The completed framestores were then loaded into a DPS Personal Animation Recorder, which output them onto component BetaSP. The spot was mastered on D2.

Of all the difficult shots and animations that Computer Cafe had to use to complete the 15-second spot, the bursting tops finale was the most challenging. "That scene was very involved and had a lot of different sequences to it," Barnes said. "First, a separate particle animation with a matched camera move was rendered and image processed. The sequence was then used as a foreground element with

Shasta continued on page 20

Florida Agriculture Agency Wins Emmy

Douglas Carey

Given the task of creating both an informative *and* entertaining public service announcement (PSA), Gary Seamans joined forces with the Video Toaster, rose to the challenge and made history, too.

Led by Seamans' direction, the Florida Department of Agriculture & Consumer Services produced an Emmy award-winning series of nutritional announcements that began airing in late-1992. The Emmy, which was presented last November, marked the first time a Florida state agency had received such an award.

Comprised of eight music videos, the "Fresh-2-U" campaign featured the Toaster's animation capabilities and a group of enthusiastic middle-school children to promote good nutrition and Florida agricultural products.

Seamans said he was introduced to the Toaster by agency producer Rick Lurding, a Toaster aficionado who served as the videographer for the "Fresh-2-U" campaign. The two pitched the idea of purchasing a Toaster for the agency during the campaign's infancy.

"We had the option of going out-of-house to an animation company and having an effects place do all the editing, or we

Emmy continued on page 19

International Watch

Christina Knighton

FUGISAWA, JAPAN

Veteran Surfer Opens Production Studio

Putting down his surfboard, Motoji Tobita, 34, has opted for a mid-life career transition by opening a systems integration firm equipped with several different platforms, including the Video Toaster.

"We supply the fire and excitement to multimedia and video solutions," Tobita says.

In addition to producing the graphics for several Japanese television shows, Tobita does the animation for *Ugo-Ugo*, a daily children's series. Industry insiders indicate that Tobita may collaborate with Japanese pop star Kenichi Shigeto on a new late night show to air this summer.

TOKYO

LightWave Enhances Video Game

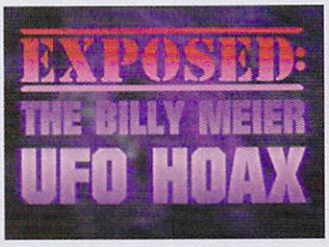
High Tech Labs has introduced the first line of video games produced with LightWave 3D, according to a company spokesperson. Tentatively named *Space Shooting*, the games are designed to work on Pioneer Electronics' "LaserActive" laserdisc, CD-ROM and CD-I media player. They are slated for U.S. distribution later this year by Sega Enterprises Inc.

International continued on page 21

Toaster to Expose UFO Hoax

Think Tank and Production Studio Collaborate

Josh Moscov



Palo Alto, Calif.-based companies TotalResearch, a think tank made up of philosophers and intellectuals, and DogStar Productions, a multi-purpose video and animation studio, have joined forces to produce documentaries on controversial, historical subjects, according to a joint spokesperson.

Their first project—a documentary on the Billy Meier UFO case—has been in production for several months. DogStar has been relying on desktop video technology, especially the Video Toaster, to document the research collected by TotalResearch president Kal Korff during his undercover investigation in Switzerland of the Billy Meier cult.

Why did Korff decide to call upon the services of a production studio with a Toaster system as the main rendering engine? Instead of relying on the print data he had com-

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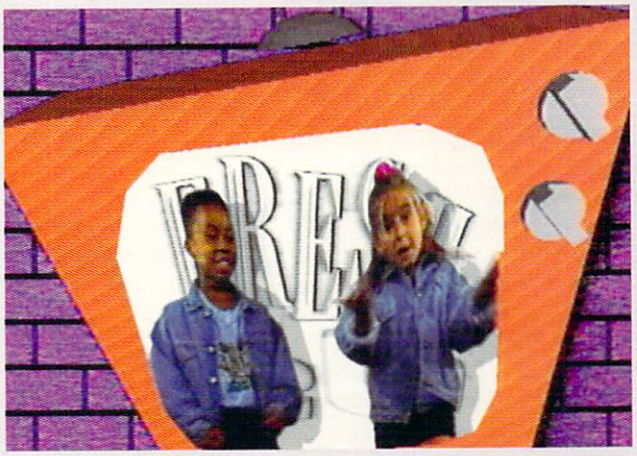
could do it all in-house," said Seamans. "The agency was enticed [with the purchase] because we could do all the animation in-house, we had all the effects with the Toaster, and we would keep it when it was over."

Once approved, the agency's video team put the Toaster to work as an upstream effects generator. A Grass Valley 100 served as the primary switcher, while a Sony 910 editor controlled the operation.



"That allowed us to do multiple layering, where we set up a key on the Toaster and then set up a third key on the Grass Valley and did it all in one pass," said Seamans. "That helped us out a number of times on effects, and it was also a timesaver."

Soon after the "Fresh-2-U" spots began airing, the agency expanded the campaign by producing two PSAs featuring the Atlanta Braves. Months later, a similar campaign was introduced with several players from the Florida Marlins.

Seamans, who recently completed directing a series of PSAs with the Toaster for the Florida seafood industry, said he gains new insight into the Toaster's potential with every campaign.

"The very first spot we did had very little Toaster in it," he said. "We had storyboarded all the spots at first, and when we realized just what the Toaster would do for us, we quickly changed some of the storyboards to include more graphics and keying effects...because it helped us be a little more creative."

Seamans' creativeness also extends to the pocketbook, where the Toaster's cost-effectiveness has enabled the agency to maintain its Emmy award winning pace. Along the way, the Toaster is also helping to add a spice of entertainment value to the staid environment of PSAs.

"What we're trying to do is make state agency videos entertaining so that people will want to watch them," Seamans said. "We were very fortunate in that our bureau chief presented this really creative package to us and asked what we could do with it. And I like to think we took the ball and ran with it. But it could not have been done without the Toaster."

VTU

What's in a Name?

Y/C Plus and Prime Image File Suit

Josh Moscov with Rick Lehtinen

Topeka, Kan.-based Y/C Plus Inc. and Saratoga, Calif.-based Prime Image have filed lawsuits against each other in the U.S. District Court, Northern District of California, San Jose Division.

The lawsuits focus on whether Prime Image's latest product release, the Y/C++, violates the trademark rights on Y/C Plus' Y/C Plus (introduced in January 1993).

The conflict began in September 1993 when an attorney representing Y/C Plus notified Prime Image president Bill Hendershot that the Y/C++ infringed on the trademark of the Y/C Plus. The letter requested that Prime Image "immediately cease and desist from using the name," according to Hendershot. When Prime Image failed to comply, a second letter was sent.

Y/C Plus president Larry Heilman emphasized that both attempts at communicating made it clear that if Prime Image changed their product's name, the suit would be dropped.

"That's all it really came down to at that point. And ethically they are just wrong," said Heilman.

Hendershot said that Prime Image didn't check the trademark status of the Y/C Plus prior to introducing the Y/C++. After receiving the letters from Y/C Plus' attorney, Prime Image did a check and discovered that Y/C Plus held no trademark and had just filed to register the "Y/C Plus" on Sept. 20, 1993 (about nine months after the Y/C Plus had entered the marketplace). This led Prime Image to file a declamatory relief complaint suit, demanding Y/C Plus either take action by year's end or discontinue the complaint.

Y/C Plus responded in a countersuit declaring that Prime Image's choice of name was not only a trademark violation but had negatively influenced its business. Y/C Plus seeks minimum punitive damages of $100,000.

"We have been getting people calling in to ask about the similarity of the product names. They recognize our product but are definitely confused. Our sales are being affected," said Heilman, in discussing his grievances with Prime Image. He also contends that the extra plus sign in the name Y/C++ may give the impression that the Prime Image product is an upgrade or revision of the Y/C Plus.

According to Hendershot, Prime Image's Y/C conversion product was named as it was because the company has been using the + designation for eight years, starting with its TBC+.

"Our basic position is that Y/C is a generic term. Y stands for luminance and C is for chrominance. Everyone in this industry uses it. I have spoken to many dealers, manufacturers and end users; no one has expressed any confusion regarding these products," said Hendershot.

In addition to having nearly identical names, the Y/C Plus and Y/C++ provide similar roles in the desktop video market. Both are able to take in S-VHS or Hi8 signals and convert them into a composite signal that the Toaster requires. The only difference, in fact, between the two is in their mode of operation: The Y/C Plus is a card that works internally in the Amiga while the Y/C++ is an external device which connects to the rear panel of the Toaster through BNC connectors.

At press time, Hendershot announced that Prime Image "in good faith would change the name of their Y/C product to The Little Magic Box." He made it clear, though, that his decision was not an admission of Prime Image being guilty of any of Y/C Plus' allegations. Hendershot also said that Prime Image was in the process of filing a counterclaim to Y/C Plus' earlier suit.

"I have no choice but to file the claim—this litigation is very cumbersome. But I must protect my company even though we have changed the name of our product to The Little Magic Box," said Hendershot.

VTU

Shasta continued from page 18

an Alpha channel that enabled us to realistically blend the soda mist into the background image."

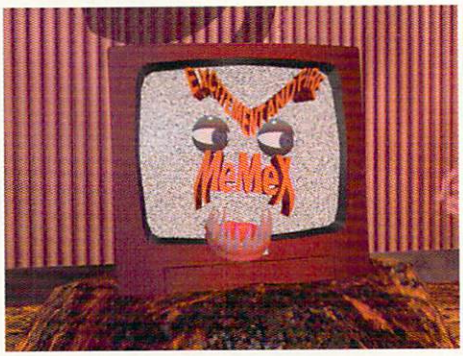
Hired by Santa Barbara, Calif.-based EMK Marketing and Slade Creative, Barnes said that Creative Cafe's previous LightWave productions were integral to them receiving the Shasta contract. "Both agencies were aware of our work for the Foster's Freeze food chain, where we had used the Toaster for a 30-second spot that was half video and half animation. But I strongly doubt they were aware of what system we used, and we decided not to get into the technology specifics with them. It was our goal that the quality would just impress them."

The agencies had to have been satisfied with Computer Cafe's ability to work under tremendous deadline pressure to meet the December 30 airing. "We conceptualized, storyboarded and created a final product in three-and-a-half weeks. Most of it was done over the Christmas holiday—we didn't stop," noted Barnes.

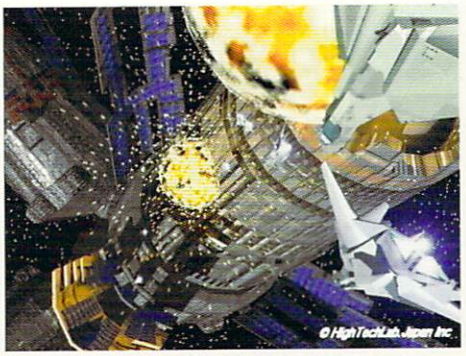
Developer of the Foster's Freeze food man, Computer Cafe has been using Toaster systems for more than three years. The studio has a diverse clientele and can be reached at (805) 922-9479.

VTU

International continued from page 19



Motoji Tobita's Toaster animations (above) appear in Japan's *Ugo-Ugo* TV show.



A scene from *Space Shooting*—the first video game produced with LightWave.

South Korea's KIVA is Toaster training the country's first MTV generation.

SEOUL, S. KOREA

Toaster Training Centers Open

The Korean Institute of Visual Arts (KIVA) is one of several technical schools opening across the country to provide training in all aspects of broadcasting with a focus on Video Toaster technology.

To allow for one-on-one training, KIVA limits enrollment to 20 students per classroom and classes generally run for six months. The curriculum includes a translated version of the Video Toaster manual and an accompanying workbook.

"Korea is, right now, developing its own MTV generation," said NewTek international sales manager Scott McCullum.

Currently using Toaster technology, SBS, a major television network based in Seoul, has a top technical director working double duty at KIVA to find future animators and producers.

VTU

UFO continued from page 19

piled, Korff wanted to create an arresting, visual presentation of his findings that would prove the faultiness of the hundreds of photos that Meier claimed had been taken of outer-space beings.

"Upon my return to the United States, the Meier cult was promoting their lies any way they could. Meier had his photos and supposed messages from outer space beings that he was marketing as books and tapes to manipulate people around the world. The media monster was definitely in place. I had seen the Toaster at MacWorld and was intrigued with its potential. But I also needed professionals who really knew how to use it in order to appropriately convey my findings," explained Korff.

He found his pros in DogStar partners Gina DiBari and H.W. Parker. The two have been working with the Toaster since it was introduced to the market. Although still in its first year, DogStar has gained notoriety around the San Francisco Bay Area for the seven music videos it completed in 1993.

Working with three Toaster workstations and anxiously waiting for their Screamer to be sent from NewTek, Parker and DiBari are using the Toaster for titling, Chroma and Switcher effects and lots of transitions as they work on the UFO project.

"A lot of Kal's research involves image enhancement techniques to prove when phony photos were taken during the Meier case. The Toaster will help reveal this," explained DiBari.

LightWave is also being used to clarify some key points regarding supposed UFO sightings. A UFO circling a tree will be re-created as a 3D object and rendered at different angles to show how it's been tampered with.

"We hope by taking these images and making them 3D objects that the perspective will show how the Meier photos were really staged from models," said Korff.

The Toaster visuals not only convey the material from Korff's investigation but all of the data researched to date. "There's 12 years of research on Billy Meier. It's the most popular UFO case of all time and contains footage from hidden cameras that I used undercover. The Toaster's capabilities will be essential to the final production," said Korff.

All three claim that the challenge in this project has been learning how to produce visuals that would be eye pleasing and at the same time maintain the credibility of the study. "Parker and Gina have a lot of experience with creating textures from making music videos. But this documentary demands that we produce visual elements that support a scientific argument. We don't want it to be too scientific or boring, which would be even worse. It's definitely a fine line," said Korff.

Upon completion, *Exposed: The Billy Meier UFO Hoax* will be distributed by Underground Video. A release date has not been set as of this report.

But that's just the start of the DogStar-TotalResearch collaboration. After finishing the Meier expose, DogStar will immediately launch into another project: a documentary on the John F. Kennedy assassination, which will be based on a 16-year study by Korff.

"TotalResearch is the first group to solve the murder. The U.S. government, in fact, has accepted our findings as the final verdict of history," said Korff, who appeared on *Larry King Live* on November 22, 1993 (the 30th anniversary of the Kennedy assassination) to discuss his research.

DogStar Productions can be reached by mail at: 236 Stanford Shopping Center, No. 122, Palo Alto, CA 94304.

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UTG?

We haven't decided what to call it quite yet. Maybe we'll call it *"The Ultimate Video Toaster Reference Guide,"* or maybe *"The Atomic Toaster Catalog: Version 3."* In any case, it is the most comprehensive reference manual of its kind for the NewTek Video Toaster and related digital video software and hardware systems.

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Toaster Toolkit 4000 was developed by The Byte Factory. Crouton Tools was developed by Atomic Toaster Catalog. Cocoon was developed by Ironworker Studios. Video Toaster is a trademark of NewTek, Inc.

DEAR JOHN

How to Parent an Object

Three Solutions for Moving Problems

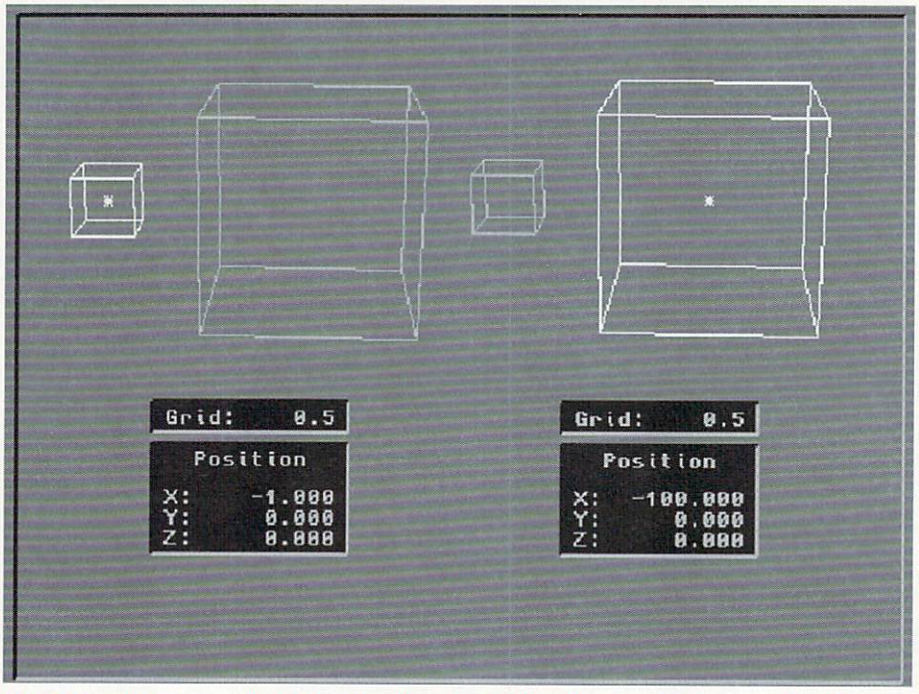
by John Gross

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

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 on-line address at the end of this column or to *VTU*.

Q: My question is about the Toaster 4000's animation capabilities. I work on a 4000 with 16 MB of RAM. What animation length can I play back from my Toaster? I want to keep the best quality possible, but I am willing to make sacrifices. What are my limitations and what can I do to expand the capabilities?

Logan Wilcoxson
Production Manager
Dancel Productions
New Orleans



The little box which is parented to the large box shows that it is located at -1 on the X axis even though the parent is located at -100 X. The small box is actually located at -101X if you look at it from the world's point of view.

A: Chances are your machine actually has 18 MB of RAM—16 MB of fast RAM and 2 MB of chip RAM. With this much, you can expect about 5.5 seconds of real-time playback of LightWave animations from the Switcher; however, it is not a high-resolution, full-color animation, but rather a 256,000-color, low-resolution one. Nevertheless, when you use antialiasing and other LightWave effects to make the images look better (Field Rendering and Motion Blur, for instance), the animations tend to look very good. They are often perfectly acceptable for many types of applications.

If you need to generate longer animations of this type, the only thing standing in your way is more RAM. The Amiga 4000 cannot accept more than 18 MB of RAM, but using an add-on such as DKB's 3128 Zorro III expansion board will allow you to add up to 128 extra MB of RAM. This could expand your animation playback capability to 50 seconds.

If you need better quality animation, but can't afford a single frame-accurate VTR, you may want to look into Digital Processing Systems' Personal Animation Recorder (PAR). This allows you to play back digitally recorded animations directly from a hard drive in real time. The PAR has received numerous accolades and can be a boon to any animator.

Q: So what happened to ToasterPaint?

Jim Grunyon
via America Online

A: I assume you are referring to everything in the new Toaster software being updated except ToasterPaint. Unfortunately, Jamie Purdon, the programmer of ToasterPaint, became ill and was unable to upgrade the program. Don't worry, though! NewTek has other people working on it and someday, hopefully sooner than later, you will see a new ToasterPaint.

Q: Can you explain what happens when an object is assigned a parent and then jumps out of position? Better yet, how do you move the object back to its precise location?

Presently, I avoid that jerk by parenting the object when I first load it into the Layout window, but I get in trouble when I move the object to a new location and un-parent it. For example, think of moving an object with a crane. First, I parent the object to the crane, then move the crane to another location. When I want to move the crane away from the object by un-parent-

continued on page 26

STRETCH

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ing, the object moves and I find it almost impossible to move the object back to its previous position. Any solutions?

Bob Ocegueda
Poway, Calif.

A: You've run into one of the most asked-about problems with LightWave. In order to understand what's going on, you need to know how parenting works in LightWave. When you parent one object to another, the parent becomes the center of the world for the parentee. Just as the middle of LightWave's grid (0, 0, 0) is the center of the world for an object that is loaded into LightWave, a parent is the center of the world for its children. The only difference is that this world center can move.

You may be confused if you look at the coordinates for a parented object. Let's say that you move a child object -1 meter on the X axis and create a keyframe for it at frame 0. What you have done is move the child one meter to the left of the parent (assuming the parent hasn't been rotated). Now, no matter where you move or rotate the parent, the child will stay in this relative position. If you move the parent -100 meters on X and create a key for it, the child will still say that it is located at -1X. Relative to the world coordinates, however, the child is located at -101X.

If you were to un-parent the child at this point, it would snap to the location where its coordinates say it is, namely, -1 on X. Unfortunately, you cannot parent an object for a while, then un-parent it and keep it in its same parented position.

How can we make your crane example work? There are a few ways. First, you could try not parenting the object to the crane. You would then have to create keyframes for the object so it moves with the crane until the point that the crane drops the object. This may be easier said than done, depending on the motions of the crane.

Perhaps a simpler way is to use a null object; it is simply an object that is a point only. It has no polygons and therefore cannot appear in a rendered image. Nulls are often used as parents or targets. The way you could use a null with your crane and object is to parent both the crane and the object to the null. Now, instead of moving the crane around, move the null and both objects will follow. Of course, you would want to keyframe the object into position at the end of the crane.

When it is time for your crane to release the object, simply stop the null, drop the object, and then move the crane object away, leaving the null and the other object where they are. You can always move an object away from its parent, but moving a parent will always pull the object along for the ride.

It's important to remember that when you move a parented object, it may not move exactly as you think it should. The reason for this is that the parent object may be rotated. If it is, remember that the parented object will always move in relation to the parent. If our parent is rotated 180 degrees in heading, moving the parented object to the right will actually move it to the left.

A third, although more complicated solution, exists. You could parent the object to your crane as you originally tried, and at the moment that the crane drops the object to the ground, you could use object dissolve envelopes to dissolve out the parented object and dissolve in a duplicate, un-parented object in the exact position. If you try this, make sure you perform the dissolves in one frame. In other words, in between frames 99 and 100 (for example), dissolve out the parented object and dissolve in its duplicate.

Q: I am a movie director, and most of the projects that I work on are very heavy in visual effects. Currently, I am putting together a "space opera" a la *Star Wars*. I'm considering the possibility of doing the effects myself (crazy, I know), possibly on a Toaster (crazier still). My questions for you are:

1. Can I get first-rate (emphasis on first-rate) visual effects (primarily space effects with spaceships, planets and explosions) using the Video Toaster? The output is for 35mm film. Will these effects really hold up on the big screen?
2. How much and what kind of equipment and peripherals do I need?
3. How much should this cost?
4. How long would a 3- or 4-second effects shot take to render?

I'm a decent artist, very familiar with visual effects and somewhat computer literate. I would greatly appreciate any information you can give me.

Bill Malone
Malone Productions
Studio City, Calif.

A: In answer to your questions:

1. Definitely. LightWave programmer Allen Hastings is a space buff and has added features to LightWave that make it one of the best 3D programs for creating space effects. LightWave is extremely capable for the types of effects you wish to perform. And yes, the images will hold up on the big screen if you render in proper resolutions. I have seen medium resolution images (752x480) that have been transferred to film that looked surprisingly good, but I would still use a higher resolution. Some good examples of LightWave effects can be seen on *seaQuest DSV* and *Babylon 5*.
2. The type of equipment you need depends on the amount of work you want to do and how fast you wish to do it. Of course, you are going to need a Toaster or Toasters and probably a Screamer, lots of RAM, a very large hard drive or drives and a method of transferring the rendered images to film. Most likely you would want to transfer the rendered images to an Exabyte tape drive, then bring them to a facility that will transfer them to film.
3. Costs can vary greatly, of course, but for a minimum setup, I would estimate approximately $25,000 to $35,000 to get you started. This would be an approximate cost for all of the items listed above.
4. A 3- or 4-second effects shot rendering time can vary tremendously based on the complexity of the scene and the resolution you are rendering at. Of course, it will also depend on the number of Toasters and Screamers you may have. There should be no reason that you would not be able to render an average scene this long overnight (at the most) using a Screamer.

VTU

John Gross is an animator for Amblin Imaging and Editor of the LightWavePRO *newsletter.*

Questions can be sent to him in care of this magazine or on-line on CompuServe at 71740,2357 or on America Online as Bubastis.

Picasso II

Retargetable Graphics* have arrived!

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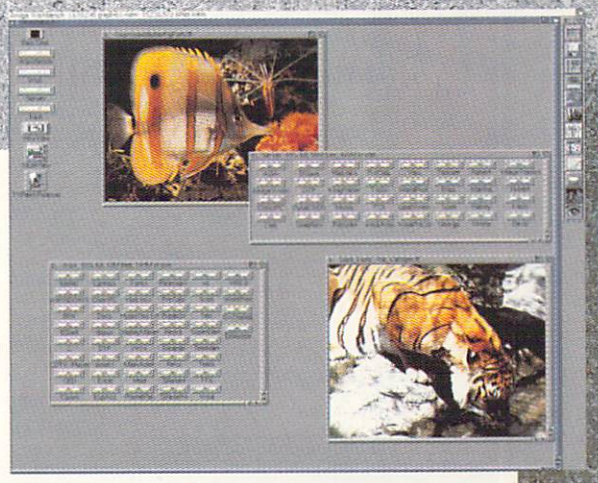

1280 x 1024 256 color Workbench screen displayed on an A3000 with the Picasso II.

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Picasso II RTG means *No Waiting for Specially Programmed Versions of Your Favorite Software.*

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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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TIPS & TECHNIQUES

Real-Life How-Tos

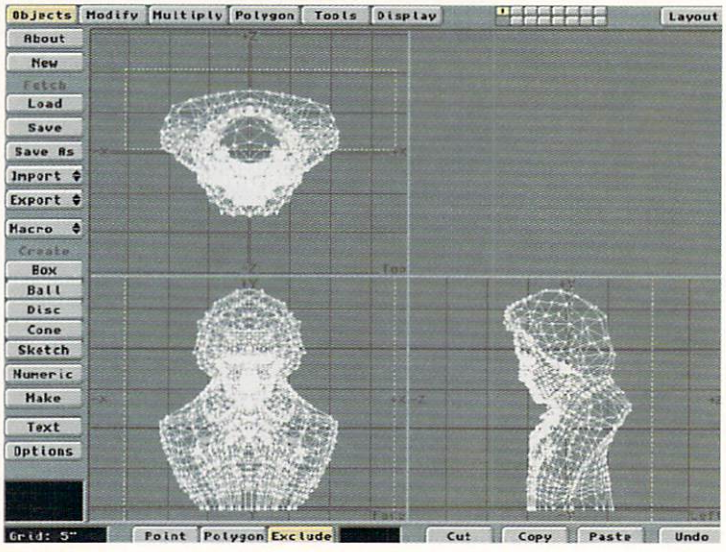
Using Texture Maps in LightWave 3D

by Brent Malnack

When using images for texture mapping in LightWave 3D, they should be loaded in 24-bit format. The 24-bit texture maps take more RAM, but they render much faster. If the texture maps were created in a program such as DeluxePaint IV, simply load them into ToasterPaint and resave the image maps.

ChromaFX Stills

This handy tip comes from Jay Reischl of Double E Computer Systems in Omaha, Neb. I've always wanted to apply ChromaFX to still images, but the way the Toaster is designed, it isn't possible to apply ChromaFX to an image and then save it. Providing you have some extra equipment, it is possible to do with the following tip.



The Volume tool in Modeler cuts parts of an object that will not be visible when rendered.

One TBC Version

If you have only one TBC, follow these steps:

1. Load the image you want to process and render it to a Toaster framebuffer.
2. Select that channel in Program and record the image to videotape for at least one minute. (This gives you time to adjust ChromaFX.)
3. Place the tape into the source machine and run it into the Toaster while selecting the desired ChromaFX. Once the right effect is achieved, record the output to another tape.
4. Place the newly recorded footage into the source deck and use the Toaster to freeze a frame from it. You now have a ChromaFX-processed still.

Two TBC Version

If you have two TBCs, follow these steps:

1. Load the image you want to process and render it to a Toaster framebuffer.
2. Connect the Toaster's Program output to one of the TBC's inputs.
3. Using the TBC's freeze, grab the image.
4. Connect the Toaster's Program output to the other TBC's input.
5. Run the TBC with the frozen image into the Toaster and load the desired ChromaFX.
6. Once the desired effect is loaded, freeze the image into the second TBC.
7. Repatch the Toaster system.
8. Run the TBC with the frozen ChromaFX still back into the Toaster and grab it. You now have a processed still.

Toaster and PAR

If you have the Digital Processing Systems' Personal Animation Recorder (PAR) and a TBC IV, you can also add ChromaFX to a still image.

1. Load or copy the image to the PAR board.
2. Run the output of the PAR board into a Toaster channel and set up the desired ChromaFX.
3. Run the Program output of the Toaster into the input of the TBC IV.
4. Freeze the image with the TBC.
5. Run the output of the TBC into an input in the Toaster.
6. Grab the image with the Toaster. You now have a still image with ChromaFX.

Practical Toaster Projects

This tip was submitted by Rich Robbins of Great Plains Motion Picture Company in Omaha, Neb.

Although the new Toaster software supports variable speed transitions, some effects work and others don't. I suggest sorting Toaster effects into various categories. First, determine which effects you want to use and make a list.

With a program such as TRexx Professional or Toaster Toolkit 4000, create a project with the following categories, each with the same type of effects in a different bank:

Wipes Digital Moves
AnimWipes Variable
Speed Effects

This organization makes it easier to set up effects when using an edit controller, such as Sundance for the Macintosh. In Sundance, Toaster effects are selected by typing in the bank, row and effect numbers. Also, when setting up custom projects, it is always a good idea to place the ColorBars effect in it. This makes placing bars at the head of the tape simpler.

continued on page 30

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Hollywood Sets

Sometimes in our excitement to create the ultimate model, we forget the objective of keeping rendering times to a minimum. With that in mind, a little lesson can be learned from Hollywood. In movies, many sets of homes or towns are nothing but building facades. These fronts reduce costs, and allow the filmmakers to better light an interior set in a traditional movie studio.

By using the Volume tool in Modeler, parts of an object that aren't going to be visible in a rendering can be cut off. This reduces the RAM consumption and the amount of time it takes to render a scene.

To test this theory, load the Beethoven object into LightWave, set the Resolution to Medium, the Antialiasing to Medium and the Adaptive Sampling to 0. Render the image and write down the render time.

Load the Beethoven object into LightWave Modeler. Select the Volume tool at the bottom of the screen and set it to Include. In the top view, open the Volume tool so that it consumes the bulk of the Beethoven object that resides in positive Z space. Press the z key. This deletes all of the points and polygons that were in the Volume's space. Save the object with a new name.

Exit Modeler and click on the Replace Object button in the Object Control Panel. Select the new Beethoven object in place of the original. Render the image.

Although the savings is only up to 10 seconds depending on your hardware, multiply this over the course of 300 frames; it adds up.

Send Us Your Tip

Send us your Toaster tip or technique. If we publish it, we will renew your subscription to *Video Toaster User* for one year. Also, one lucky person per issue who submits the hint that Brent Malnack determines to be the most useful will receive a free copy of *Mastering Toaster Technology,* a $54.95 value. Send your Toaster tip or technique (no more than 200 words) along with a 24-bit IFF file or color slide to illustrate your hint to: Brent Malnack, Positron Publishing, 1915 N. 121st. St., Ste. D, Omaha, NE 68154. All submissions become the property of Positron Publishing and cannot be returned. For this winning tip, Rich Robbins receives a copy of *Mastering Toaster Technology.*

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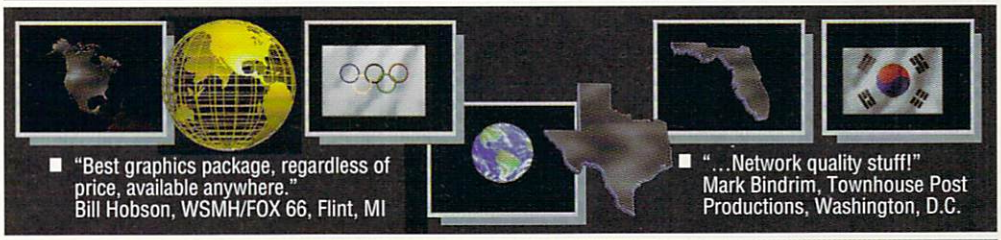

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DR. VIDEO

A Look at Time Code

The Options Available for Determining Tape Position

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: I once talked to a video engineer from a major production house near my home. When I asked what he did, he said a big part of his job was "painting and shading cameras." What is that?

K.A.
Orem, Utah

Photo courtesy Shook Electronics

Inconsistencies in camera setup are most noticeable in multi-camera control environments like remote production trucks.

Rx: Big-time studio cameras are always operated by two people. The *camera* person aims and shoots. The *video control* person adjusts iris and black level and makes scene-by-scene corrections in color. (This is roughly analogous to the film world, where cameras use both a camera person and a focus puller.)

The video controller is needed because the same performer, viewed from different angles, will have a different look (despite of the lighting director's protests to the contrary). In addition to lighting, these differences are caused by individual responses between cameras and by variations in the responses of each color channel within a single camera. *Shading* takes care of problems inside the individual camera pickup devices and lens. *Painting* deals with color variations in the camera as a whole.

In the days before CCDs, cameras used pickup tubes. Since these were heat-generating, they tended to subtly change their characteristics, or *drift*, as they warmed. These variations, along with drift in the circuitry of the day, meant that the video control operator was once a twiddling fool who needed perfect color vision to boot. Today, the job is much easier, although for fast-action events (like live sports productions controlled in a remote truck), three or four cameras are all one would feel comfortable controlling.

Q: Now that almost any computer can do digital video, how long will it be until we see a Toaster offered on a PC?

B.H.
San Mateo, Calif.

Rx: Whoa! You've stepped into some public relations hype, and if I were you, I'd check my boots before I went walking on any carpets.

Computer people are fond of bragging about PC digital video, which consists of a series of 320x240 images, captured with an add-on board, and usually stored to the hard drive by means of a JPEG or MPEG card. On playback, the itty-bitty frames are plumped up to size by a hardware scaler, then converted to composite video or Y/C.

Real digital video, the kind with a name like D-1, D-2, D-3 or D-5, is much more sophisticated. The video is digitized, shuffled, and distributed (smeared) over the tape in multiple channels. This way, even a major dropout hurts only a small part of the image. Further, error correction codes reconstruct most problems, and error concealment schemes hide the rest. This results in a high-quality video that is nearly bulletproof.

The Toaster actually has an unsupported provision for digital input and output, and the internal codes used to store images are supposedly close to D-2. If enough users are interested, I'm sure a digital I/O will become available.

Q: What is the difference between linear, vertical and the proprietary time code used in some VCRs?

K.L.
Phoenix

And...

What is the use of the "User Bits" part of time code?

Z.F.
Tacoma, Wash.

Rx: Here is the short answer (explaining in further detail would require an entire article).

Time code describes the unique tape address of

continued on page 36

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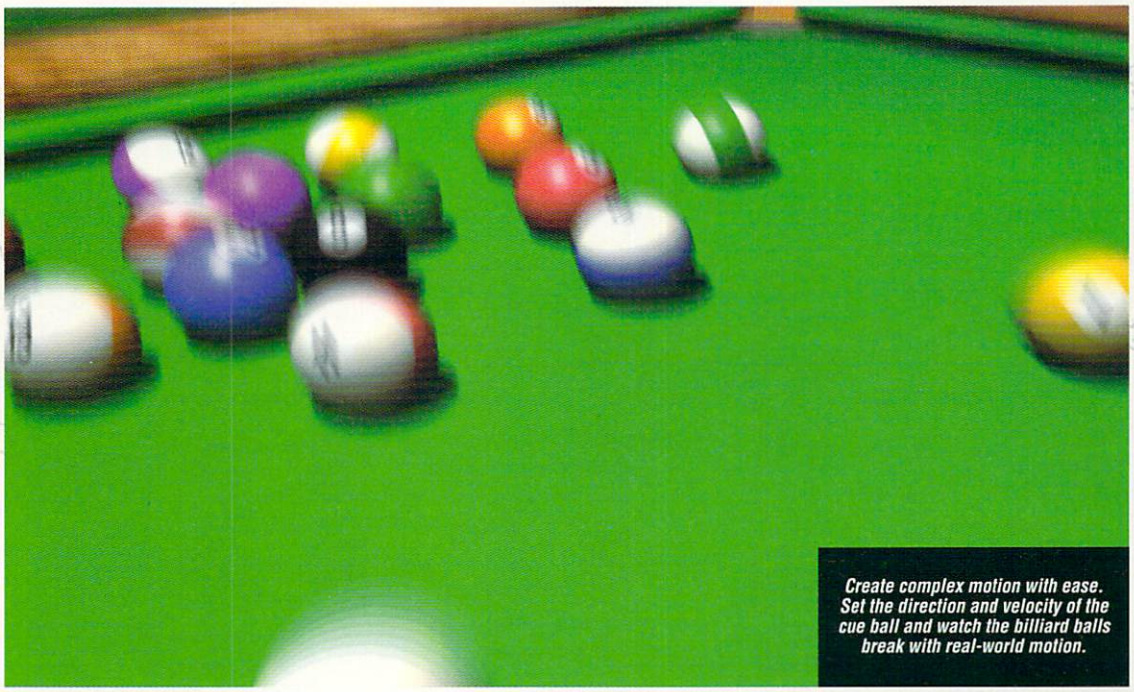

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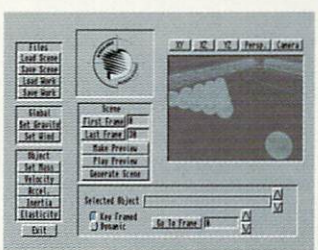

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each frame of recorded video. It comes in three varieties.

Linear Time Code (LTC)

LTC is an audio signal recorded on a linear tape track. It consists of a series of square waves which shift phase to convey digital information. The 80-bit code words represent time code using binary coded decimal (BCD) characters. About one-third of the bits are for time code, one-third for a sync word and one-third for user bits.

The user bits are optional code words which can be programmed however users want. Many facilities use them for reel numbers or day and date. (The time code bits only describe hours, minutes, seconds and frames.) Other systems have user bits to describe TBC settings or edit information.

Vertical Interval Time Code (VITC)

VITC is a 90-bit time code signal that is encoded into the vertical interval of a video signal. It has three advantages: First, it doesn't occupy a linear track that could just as well have carried audio information. Second, it works even if the VCR is paused or on freeze frame. Third, it doesn't require any audio wiring, because it is part of the video. While we are at it, VITC has twice the resolution, as there is one address for each field, instead of one for each frame. This is important in certain forms of animation recording.

There is a drawback to VITC, however, since it is difficult for the reader circuitry to pick it up while the tape is shuttling at high speeds.

Most sophisticated editors and animation control systems use both LTC and VITC, switching from one to the other depending on the controlled VTR's mode of operation.

The Others

Several other methods exist for determining tape position. These include pseudo time codes, circuits which count control track pulses, tape timers with mechanical or optical tachometers, and even good old stop watches. Detractors sometimes refer to anything besides true SMPTE or VITC as *banana code*, because it is typically unreliable and difficult to interface. Some editing systems find their niche by reading and operating with these ersatz codes. It usually doesn't take the VTR manufacturers too long to come out with time code updates for their equipment, however, and a couple of service companies provide time code modifications for a fee.

As a historical note, in the early days, time code was promoted by a company named EECO, thus EECO-code was the progenitor of today's time code. The EECO system was eventually adopted and standardized by the Society of Motion Picture and Television Engineers (SMPTE), and became known as SMPTE time code.

Q: How can I put together my own TV station?

D.B.

Arkansas City, Kan.

Rx: If you're contemplating building an unregulated station, any competent broadcast engineer can consult with you on this project, but I'd hate to lose you as a reader. I'm not sure they'd let you read *Video Toaster User* in jail!

Seriously, the Federal Communications Commission (FCC) takes a dim view of unauthorized broadcasts (colloquially, *pirate broadcasting*). If they treat you as they have treated others, they will track you down with radio direction finders, then gather up a few armed lawmen (often U.S. Marshals) to provide firepower and come knock on your door.

The precise legal machinery is usually to arrest *the equipment.* (Chances are it is not *type certified*, making it a form of contraband.) If they get in, they will confiscate it. They may even run off with a few non-broadcast items as well, as long as they have the appearance of being part of the illegal broadcast setup.

You, the operator of said gear, will likely receive threatening letters, and may even have a fine levied against you. The danger is that at some point you will do or say the wrong thing, be found in contempt of court, and find yourself in the slammer.

A friend of mine who should have known better found out the hard way—getting busted is a major hassle. Try cable-access channels or buy satellite time. If you *must* air your views, contact the FCC, find an attorney, and follow legal counsel now, before someone knocks on your door.

Q: I am an amateur radio operator, and I'm looking for ways I can use my Toaster as part of my ham operation. Any ideas?

R.L.

Scottsdale, Ariz.

Rx: I think you will find a lot of fun things you can do with your Toaster in ham work. Once I was hired to do a freelance assignment where I had to talk about a certain wireless microphone. When I arrived at the videographer's house, I saw one of the biggest antenna arrays I have seen. It turned out the photographer was also a ham, and active in fast-scan amateur TV. He said that each Wednesday he and his other ham TV buds gathered on the air for a round-robin uplink session. He modestly shared that his presentations generally wowed the others, and then he pointed out the Amiga he used to create his animations. That started us talking about Toasters. When I left, he was convinced that a Toaster would do a dynamite job in an amateur television environment (ATV).

On another occasion, I received a nice letter from a reader of this column. Turns out he had been a broadcast engineer for 30 years, held many industry honors, and also published a quarterly magazine dedicated to ATV.

On another note, ancient regulations designed to prevent hams from competing in the fledgling commercial radio industry are still on the books. They forbid the transmission of music from an amateur radio station. (Music would occupy excessive bandwidth, crowding an already jammed spectrum.) ATV would probably be a lot more fun if that old law was modified. (By the way, the doctor is also known as WA7RPB.)

VTU

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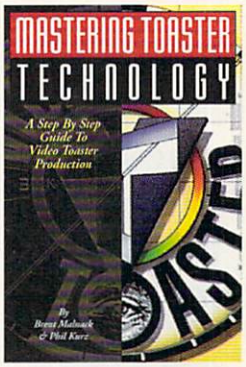

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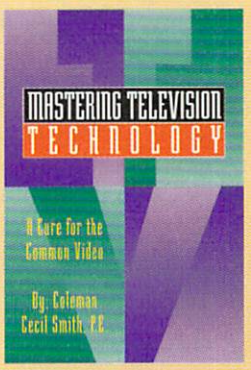

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SOUND REASONING

Don't Compromise Your Audio

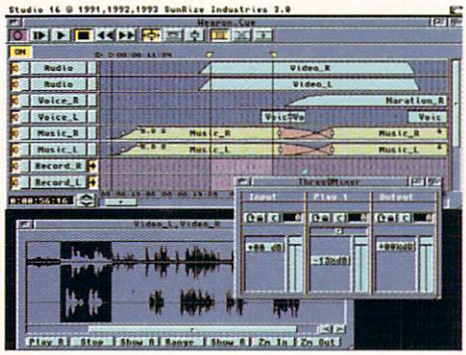
How to Add Audio Tracks Affordably

by Cliff Roth

Every cost-conscious video producer runs up against the meager audio capabilities of the low-budget videocassette formats. Although both S-VHS and Hi8 each offer a theoretical total of four audio tracks, fully and flexibly using them can be problematic.

Why would you need four or more audio tracks? For the simplest productions—talking head interviews, for example—you don't. But as video productions get more sophisticated, the need for more audio becomes crucial. Even a simple dramatic production, for example, may need separate tracks for dialogue, music, sound effects and background ambience (room tone).

To get really professional, the dialogue should be split onto a separate track for each voice, to better control level and equalization (tonal color) for each actor. Multiple sound effects tracks will often be required to combine the sounds of footsteps, a door opening, and a gunshot in a single scene, for example. In big-budget Hollywood films, the use of 48 or 64 tracks is not uncommon for the final sound mix—which includes orchestral music, lush ambience (a rain forest may require a half-dozen tracks) and sound effects.



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Built-In Limitations

Working on more humble projects, four independent, synchronized audio tracks would actually fulfill most low-budget video producers' needs. In making a documentary, you could have a separate track for voice-over narration, music, original taped audio (dialogue) and ambience/sound effects (combined). Unfortunately, there are severe limitations to the availability and sequence in which the four audio tracks on low-budget video systems get recorded, making it almost impossible to create the simple documentary track structure just described.

To briefly summarize these limitations: VHS-family tapes (VHS, VHS-C, S-VHS, and S-VHS-C) offer very high-quality, stereo Hi-fi tracks that must be recorded simultaneously with video—never afterward. A pair of lower quality, stereo linear tracks is also available, though most lower priced VCRs combine the stereo linear tracks into a single monaural track. Unlike Hi-fi, the linear audio track(s) can be dubbed afterward.

With Hi8 and 8mm videocassettes, the AFM audio comes in mono and stereo, offers very high-quality sound fidelity (though mediocre stereo separation), and—like VHS Hi-fi—must always be recorded simultaneously with video (no after-the-fact audio dubbing is possible). Two additional PCM digital audio tracks, offering very good fidelity, can be dubbed later, with an appropriate VCR. Both PCM tracks must be recorded at the same time.

For post-production mixdowns of the audio tracks, using a professional mixing console (as discussed in last month's column), most low-end VCRs and camcorders present a dilemma: Instead of offering each track's signal out of a separate jack, so that each track can have its level set independently in the final mix, you are forced to combine the tracks in a 50-50 mix.

Although extra audio output jacks and appropriate preamp circuits might cost manufacturers just a few extra dollars, producers must pay thousands more to purchase VCRs equipped with them. In particular, this problem plagues Panasonic's AG-1970 S-VHS VCR, and Sony's CVD-1000 V-deck Hi8 VCR, two workhorses of computer-controlled video editing for those on a strict budget.

The bottom line is that many producers struggle with these track limitations, devising clever schemes of mixing in the camcorder and bouncing tracks to pre-mix several sound elements prior to the final mixdown. These techniques will be discussed in more detail in a future column, but suffice it to say that they all involve compromises in fidelity, synchronization and control over nuances. For now, let's look at a few ways to solve the problem more elegantly.

Multitrack Tape

Multitrack recording (which we'll define here as four or more tracks) used to be the exclusive province of professional recording studios. But thanks to the proliferation of garage bands and semipro home recording studios, inexpensive cassette-based, multitrack recorders are now commonly available. Tascam's 424 Portastudio is a good example; at $549 list, it offers musicians surprisingly high-quality and flexibility (many of The Beatles' early albums were recorded on just four tracks).

But for use in video post-production, the Portastudio (and similar models, such as Tascam's 8-track 688 and Fostex's portable 4-track models) share one common problem: They can't be synchronized to a videotape. Generally speaking, these products offer a MIDI (Musical Instrument Digital Interface) synchronization capability that works in the opposite direction; the multitrack audio plays on its own and sends MIDI information to one or more pieces of synthesizer equipment

continued on page 40

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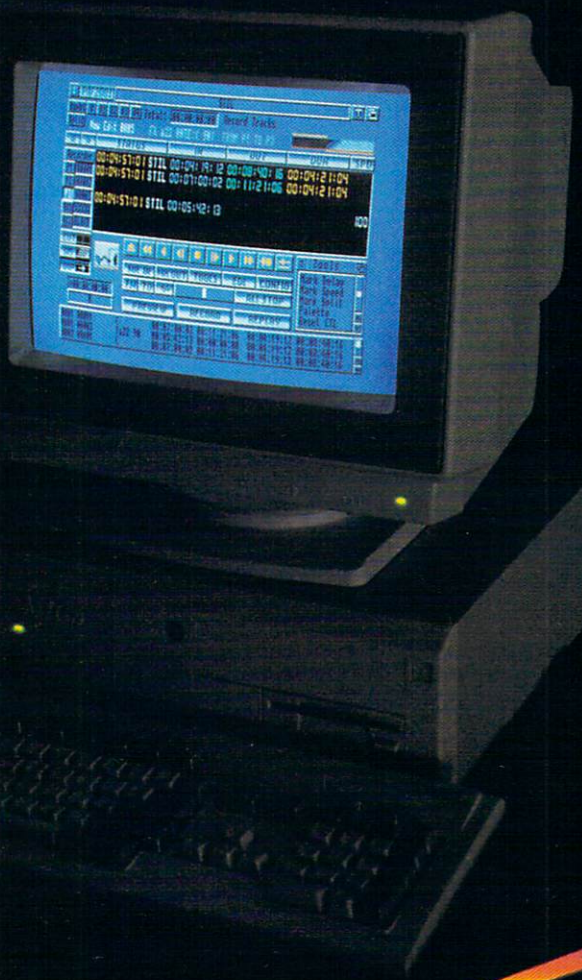

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(drums, keyboards, etc.) which then play in perfect sync to the tape.

Video editing requires the opposite and more expensive sync capability: You want to be able to play the edited picture on a VCR and have the audio tracks automatically sync up to the picture. In audio engineering jargon, this feature is called *chase/lock synchronization* and is generally achieved through the use of audible (longitudinal) SMPTE time code. One of the audio tracks on the VCR is dedicated to recording the audio SMPTE tone, and one on the multitrack is used for the same purpose. Whenever the videotape plays, the chase/lock multitrack recorder quickly locates the exact same time code on its tape and then locks in step.

Most professional and semipro, open reel, multitrack recorders can be equipped with optional chase/lock synchronizers, but they don't come cheap. A basic 8-track (analog) open reel recorder with chase/lock costs about $5,000. Fortunately, there are less-expensive ways to achieve similar capability, using newer digital recording techniques.

Computerized Sound

Practically any computer can be converted into a digital audio recording system, using a plug-in sound board and appropriate software to control it. For the Amiga, the best known and most valued product in this category is SunRize Industries' Studio 16/AD516 system, which turns the computer into an 8-track recording and mixdown system for $1,495 list. Best of all, because recording takes place on the computer's hard disk, and not on a mechanical tape system, it's relatively inexpensive to build chase/lock capability into the system. Studio 16/AD516 incorporates a built-in longitudinal SMPTE reader, as well as an optional, third-party VITC reader, for this purpose. For IBM computers, Turtle Beach Systems' 56K system, at $1,295 list, offers powerful 2-track recording capabilities (numerous 2-track recordings can readily be combined to create bigger productions).

Computer sound boards and software will also be discussed in more detail down the road. Though offering potentially fantastic value, they do have several drawbacks: You're usually limited to recording just two tracks at a time; the audio recording may tie up a more expensive computer that would be better utilized for other tasks; and the tiny computer audio connectors are susceptible to noise. The bugs and crashes that can plague multitasking can also hinder the productivity of the computer software/hardware.

Solving all of these problems in one shot, a dedicated hard-disk audio recorder offers all the benefits of computer audio with none of the downside. Akai's new DR4d hard disk recorder, at $1,995 list, is probably the best value in this category. It's a 4-track audio recorder featuring professional balanced-line input jacks, full simultaneous recording, and excellent *scrubbing* (the equivalent of slow-motion reel-rocking on open-reel decks) via a jog/shuttle control.

The price of Akai's DR4d does not include a hard drive—you determine the recording time capability by adding your own SCSI drive (a 200 MB disk provides 32 track-minutes of recording). For SMPTE chase/lock, the optional $199 list-priced IB112T does the trick. Thus, for under $2,500 (including disk recorder, SMPTE adaptor, and hard drive), a low-budget video producer has everything needed for professional quality audio-for-video multitrack.

Digital Multitrack Audio on Video

One drawback to all forms of hard-disk recording—regardless of whether you're using a computer's hard drive or a dedicated recorder—is that the media is expensive. When you finish a project, you'll generally need to erase all the data on the hard disk to make room for the next task. Removable hard disks, like Iomega's Bernoulli drives and the Syquest cartridges, don't hold much time (uncompressed), and cost quite a bit more than tape for comparable recording times. With hard-disk based recording then, you must either erase the original tracks when finished, or copy them onto archival media such as computer tape backups.

Copying this data is a time-consuming process. For a video post-production facility that may be working on numerous projects simultaneously, such delays are a royal pain. (It could take two hours, for example, to retrieve the data from a 250 MB QIC-80 backup tape.)

Though a bit pricey for those on extreme budgets, Alesis' $3,995 (list price) ADAT 8-track recorder system provides an elegant solution. It uses S-VHS videocassettes as the recording medium, so you can pop out one client's tape and pop in another as quickly as you can change tapes in the VCRs. And each $8 S-VHS tape holds two hours of 8-track digital audio recording—an incredible value, compared to the cost of computer media. Most amazingly, the ADAT recorder can individually record or overdub each of the eight tracks without affecting the others. (Each helical track is divided into eight sections, and the recorder's video heads can switch on and off as they sweep out each diagonal track.)

Because ADAT is a mechanical tape system, the chase/lock feature costs a bit more: The optional Alesis AI-2 Audio/Video Synchronization Interface, which syncs up the tape to a SMPTE source, lists for $995. A control system for ADAT is also needed. The top shelf approach is to purchase Alesis' $1,995 list-priced BRC remote control; but more frugal multitrackers can make do with MIDI-based computer software, such as a $399 list-priced ADAT interface from Steinberg-Jones (for Mac, PC, and Atari, but not Amiga). The total tab for the complete 8-track audio-for-video recording system runs about $4,400.

Fortunately, at just about any price level, there's new technology offering multitrack audio recording at a fraction of what studios had to pay a few years ago for comparable capabilities.

VIU

TAMING THE WAVE

Boolean Operations Part III

Building a Slot Machine

by David Hopkins

This month, we'll make progress on creating the slot machine we've been modeling for the past two issues. Even if you missed the previous installments, read along because you are likely to learn something new.

If you read the past two columns, you may have noticed a little problem in completing the tutorial as explained. I mistakenly told you to set the Modeler unit system to SI and then stated all of my measurements in English. As if that weren't enough, I also forgot to tell you to deselect the polygons making up the face cutter before you try to move it to the front of the machine for the Boolean operation. Finally, you actually needed to go back to layer 3 after cutting the payoff tray into the base of the machine. I hope you recognized the errors and figured out the solutions on your own. I apologize for any trouble you might have experienced.

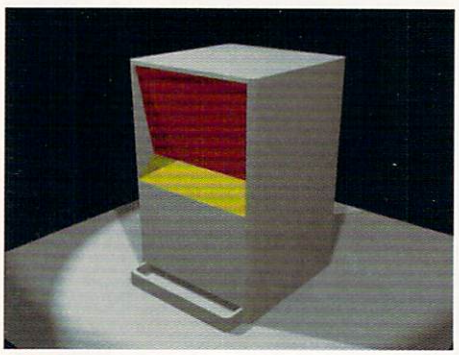

Figure 1

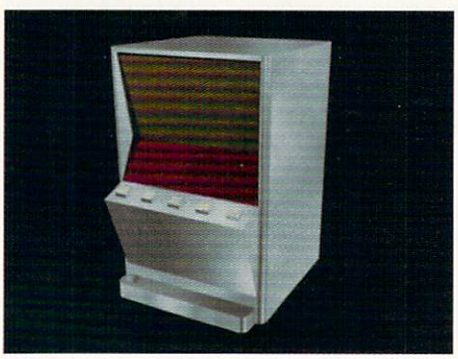

Figure 2

We left off last time with our slot machine in the shape shown in Figure 1. Let's make one more Boolean cut on the face and then create some texture images.

Clear out LightWave and Modeler so that all of your settings will match mine. Load the object, which we named SlotMachineRev3 at the end of our last session, into Modeler's layer 1. Press the A key to Autofit the object in all three views. Set the Selection Mode to Points.

First, let's change the design of our object from last issue. In the Left view, select the two points that make up the center of the inset near the middle of the machine (see Figure 2). Using the Move function, drag them up and to the left in the Left view until the coordinates display reads Y4, Z-1.

Now let's make a little bit of a hand rest/console for the front of the machine. Move to layer 2 and put layer 1 in the background. Numerically generate a box with these settings: Low X = -1.5, Low Y = .4167, Low Z = -1.5833, High X = 1.5, High Y = 2.25, and High Z = -0.9167, with Units set to Feet.

We're going to add buttons to the top of this box and rotate it so that the top of it sticks out of the slot machine. Go to layer 3 and put layer 2 in the background. Generate another box with Low X = -1.3333, Low Y = 2.25, Low Z = -1.4167, High X = -1.0833, High Y = 2.3333 and High Z = -1.2, all in feet.

Press Shift-A to zoom in on the box you just made. Change the Selection Mode to Polygons. Select the polygon on top of the box by clicking on the top line in the Left view and deselecting the extra polygons. Press the b key to bring up the Bevel window. Set the Units to Inches and make the Inset = .25 and the Shift = 0. Click OK.

Go to Surfaces in the Polygon menu and give this polygon the name LightedButton. Do not deselect the polygon. Press the b key again, and this time make the Inset 0 and the Shift .25. Click OK. Press / to deselect the polygon. Press the w key to bring up the Polygon Stats, click the + key just above the pop-up list after you have set it to Default.

Use Surfaces from the Polygon menu to set the name to SlotMachineBody. We now have a button, which we will later make luminous, in a base that will match the rest of the machine.

Press the a key to AutoFit both the foreground and background. From the Multiply menu, choose Clone. Set the Number of Clones to 4, and the X Offset to 7.25. Make sure that Units are Inches, then click OK. We should now have five buttons. Click on Cut, go to layer 2 and Paste. The buttons are now attached directly to the box we made. These buttons, by the way, are typically for betting one credit, betting all credits, drink service, and spinning the reels, among other things.

Put layer 2 in the foreground and layer 1 in the background. Now, switch to Rotate from the Modify menu. Position the pointer in the Left view with the center dot directly on top of the point in the lower left corner. Press and hold the left mouse button while moving the mouse to the left until the Angle (where coordinates usually are) is 20 degrees. Press ' to swap foreground and background, then press Shift-B to bring up the Boolean options.

This time, click Union rather than Subtract. After a moment, you will see that the part of the box sticking out of the machine remains, but the part that would

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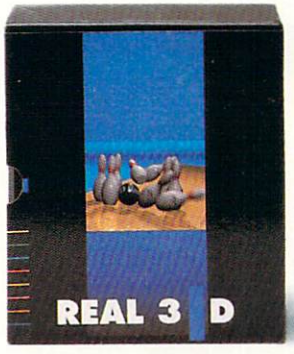

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have been inside is gone. The console has just become part of the machine itself. Save this object as SlotMachineRev4 and take a look at Figure 2 for a rendered example with the colored areas soon to be image mapped.

Next, finish the surface images needed to complete the slot machine. You'll need the Payoff Chart (Figure 3), the Slot Reel Panel (Figure 4), and art for the reels (Figure 5). My examples were created with DeluxePaint using 16-color High Resolution mode, but use what you like. The reel art should be three separate brushes, not full screens. Simply arrange a few of the possible symbols in a straight column and pick it up as a thin, tall brush. Save it as ReelArt1. Rearrange the symbols, pick up a brush the same size as the last and save it as ReelArt2. Do it once more and save it as ReelArt3.

Take the SlotMachineRev4 into LightWave by loading it directly or exporting it from Modeler. Go to the Images panel and load the Payoff Chart Image. From the Surfaces panel, locate the surface named PayoffChart. Click Surface Color Texture and select a Planar Image Map. Set the Image Name to that of your image and the Axis to Z; then click Automatic Sizing. Click Use Texture. Set the Luminosity to 80 percent.

Go to the SlotMachineBody surface. Load the Silver surface that came with your Toaster software or a similar surface. I've tweaked mine a bit. For the LightedButton surface, try a surface color of R200, G182, B139. Set Luminosity to 60 percent.

Return to the Images panel and load your slot reel panel image. Select your WheelDisplay surface and repeat the process you used with the first image.

Position your camera wherever you like as long as you can see the face of the machine. Create the keyframe, then render. Figure 6 shows what I got. To be able to see the reels spinning through the solid polygon in front of them, it will be necessary to cut holes in the polygon where they are needed.

Get back into the Surface named WheelDisplay and enter the Surface Color Texture. Click on Texture Size and write down the numbers you see. Next, click on Texture Center and write down those numbers.

Save the object as SlotMachineRev4 again and return to Modeler. Click New to clear out the old data and load or import the SlotMachineRev4. Doing so is necessary because the version that was in Modeler didn't have the surfaces defined. Thus, we removed and replaced it with the version that does. Now go to layer 2 and put 1 in the background.

Set the Unit System in Modeler to SI for LightWave's standard metric system in the Options panel from the Display menu. From the same menu, click BG Image. This allows you to place a black-and-white rendition of an image in a Modeler view. Set the pop-up list to show your slot reel panel image name. Make sure the Axis is Z and the Units are meters(m). Type the Texture Centers and Texture Sizes that you wrote down into the appropriate fields and click OK. You should see the image fitting where it belongs in the Face view.

Place your pointer where one of the holes must be cut in the Face view and press the g key to AutoCenter. Zoom in by making sure your pointer is still in the Face view and pressing the < or > keys until the image's reel window is consuming most of the view. Now, create a box the size of each little window (see Figure 7). Move over by placing the cursor in the Face view and using the arrow keys on your keyboard. Make a box for each little hole we're going to cut (with any luck they're all the same size).

When you've finished with that, press the a key to Autofit again. Now we must extrude them a bit to make hole punches. From the Multiply menu, click Extrude and then click in the Face view. The Extrusion distance will be illustrated by a yellow line with a T at the end. The crossbar of the T is how deep the extrusion will be. Make it 300 or 400mm and click Make.

Be sure that the polygons all face outward by clicking on them in Polygon Select Mode. If some are inside out, flip them. It's important that these all face outward. In the Left view, use the Move command to put the boxes where they sit on the front face with half of their depth inside the machine and half outside. Make sure that you don't move the boxes on the Y axis at all, or you'll have wasted your time. Your screen should look something like Figure 8. Set the Surface name for all of these polygons to SlotReelHoles with Surfaces from the Polygon menu.

Press the ' key to swap foreground and background, then Shift-B to use Booleans. You're back to Subtract again, then click OK. Notice how the part of the boxes that was inside the machine didn't vanish? If you click on them in the Left view with Polygon Select Mode, you can see that the sides face inward. Not only have you managed to cut the holes that are needed so that the reels can be seen, but also to supply an enclosed chamber for the reels to spin in without allowing the inside of the machine to be seen.

At the moment, there is no glass or

Figure 3

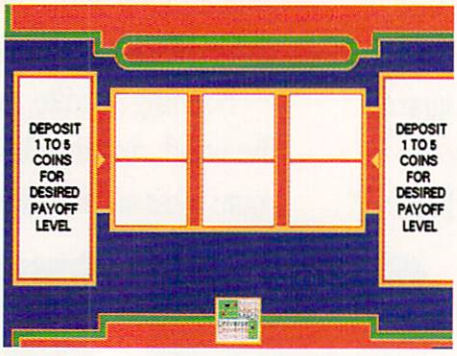

Figure 4

Figure 5

continued on page 46

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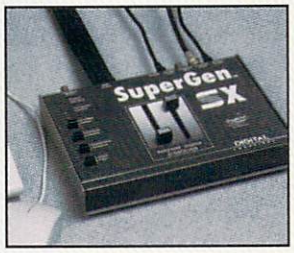

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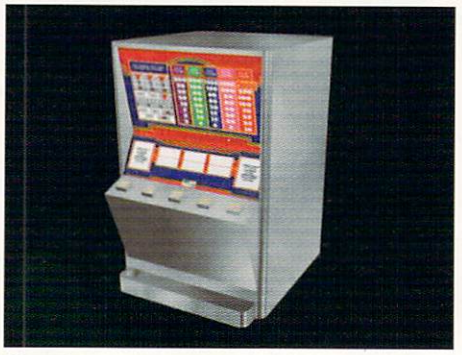


Figure 6

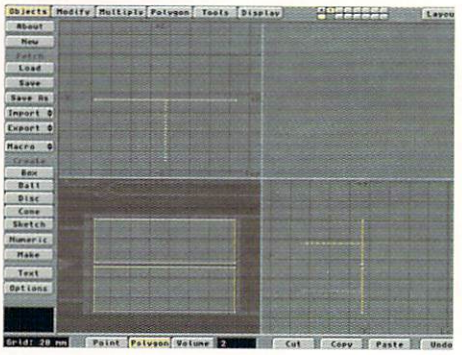


Figure 7

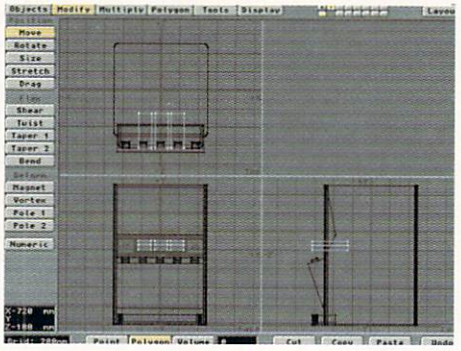


Figure 8

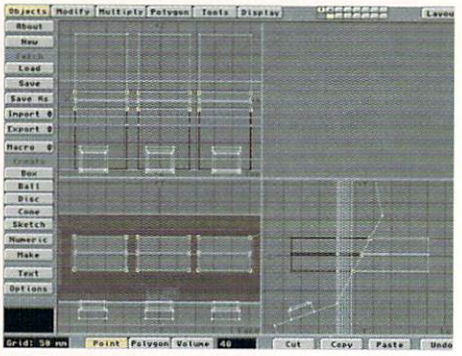


Figure 9

plastic in front of the holes. To do so, merge points by pressing the m key and clicking OK. Zoom in on the face until you have a view like that in Figure 9 and select the points shown by using the right mouse button lasso in the Left view (you should get 24). Copy these points, go to layer 3 and Paste them. Press the a key to Autofit and Alt-1 to put layer 1 in the background. Rebuild the eight boxes by selecting each polygon's points in a clockwise manner (you'll probably need to zoom in to see the points for each polygon more clearly). When you have all eight, set their Surface Name to SlotGlassWindows. Shift to Polygon Select Mode and Copy. Go to layer 1, and Paste. Merge Points. Save this object as SlotMachineRev5.

Return to LightWave and from the pop-up list in the Objects panel, replace the slot machine you now have loaded with SlotMachineRev5. Set the Surface for the Slot Glass Windows to a transparency level of 95 percent, Specularity level of 75 percent with High Glossiness, and Reflection of FractalReflections (or similar) image at 25 percent. Set the SlotReelHoles Surface to R100, G100, B100 for now. Render and have a look (see Figure 10). Save your object

Figure 10

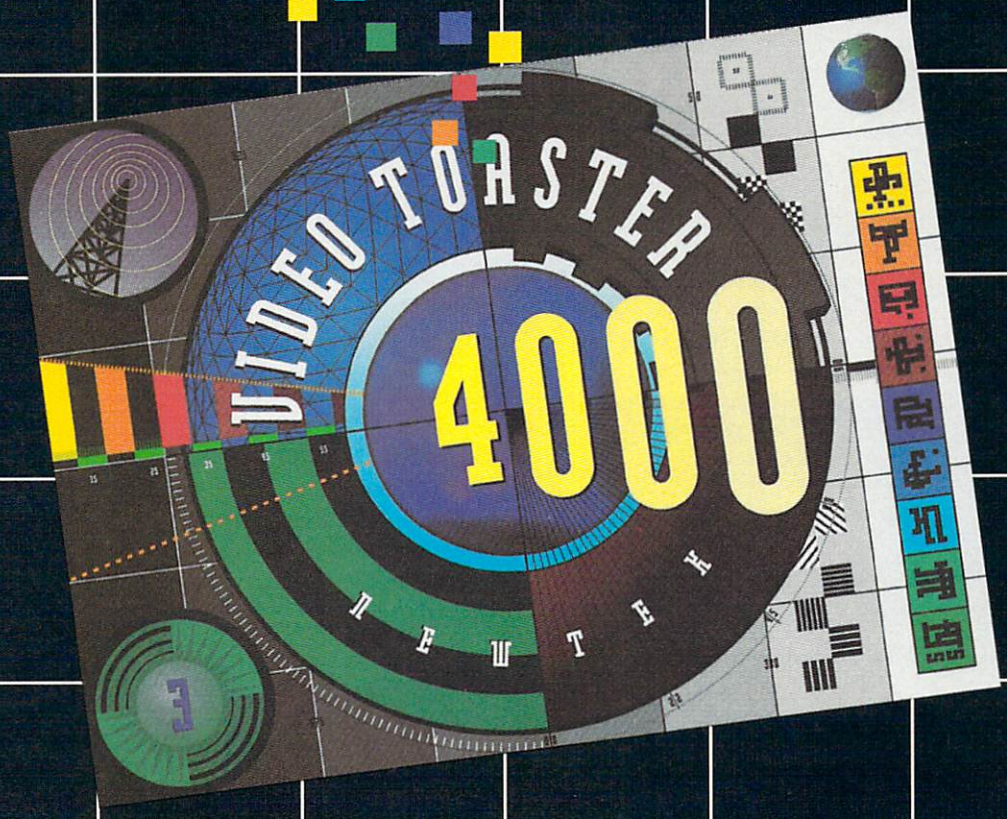
as SlotMachineRev5 again to retain these surface settings.

I'll wrap up this tutorial next month. Until then, you can write to me at the following address with any suggestions or comments.

Mach Universe
3019 Pico Blvd.
Santa Monica, CA 90405
Attn: David Hopkins

VTU

David Hopkins is Graphics Director for Gun for Hire Film and Tape—a broadcast post-production house in Santa Monica, Calif. His clients include Pepsi, Nestle, EMI Records Group and Caesars World.



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CYBERSPACE

Graphics Translation

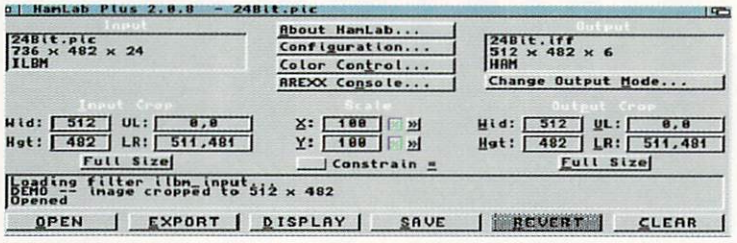
You Can Get There from Here Painlessly

by Geoffrey Williams

When you do professional graphics work, you have to deal with a wide variety of image formats created on other computers.

Corporate videos typically provide this challenge because many customers often want to use graphics that were created on their computers. The ability to translate foreign graphics formats into something that can be loaded into the Toaster is important, and this month we'll look at what is available among freely distributed software.

The first step in this process is to move the images into your Amiga. If you have a modem and communications software, you can easily transfer files from any similarly



HAMLab Plus can load TARGA, TIFF, GIF, PPM and SunRaster files.

equipped computer using the phone lines. You can also find a lot of clip art on bulletin boards in a variety of formats.

If the two computers are side by side, you can transfer the files a lot faster using a null modem cable—available from Radio Shack and other computer retail stores—and using telecommunications software on both machines.

For incredibly fast transfers between an Amiga and a PC, you might try Steven O'Leary's *GetSend*. It lets you transfer files at an astonishing 115.2K baud, which is significantly faster than even the fastest modems that achieve maximum speeds of 14.4K baud.

The easiest way, although not the fastest, is to copy the pictures to a floppy on one computer and load them from the floppy on the other. If you have an Amiga 4000, you already have high-density drives that are compatible with IBM PC high-density drives. If not, and you plan to be doing data exchange between PCs and your Amiga, I suggest you purchase one. A high-density drive only costs about $100 and will give you an extra drive if your second drive slot is not already full.

Thanks to the new CrossDOS drivers in Workbench 2.1, you can transparently read data files from IBM PC disks just as if they were Amiga disks. To activate it, simply double-click on the PC0 icon in the DOSDrivers drawer, which is located in the Storage drawer.

Macintosh files are equally easy, since newer Macs also have the ability to format and copy to PC disks. If you deal with older Macs, there are Mac drives and software you can hook up to your Amiga that directly read Mac disks.

If the image file is larger than a single disk capacity, you need to split the files on the PC and put them back together on the Amiga. *Chew*, by David McGhee, is a file splitter that includes a version that runs on the Amiga and one for the PC. You can split and restore files on both machines. I have yet to find a utility to do this for the Mac.

Once you have the images loaded into your Amiga, it's time to start converting. First, we'll cover the most common graphics file formats, and then the utilities that can convert them.

Atari ST—Uses a variety of formats, the most popular being Neochrome, Degas, Degas Elite, and Tiny.

BMP—this has become a standard under Windows 3.0, although there is a variation of the format used under OS/2. With Windows you can have either RGB or RLE compression, but since the RLE encoding often makes the files larger, it's almost never used. The uncompressed version is the most common.

C64—A variety of image formats were used on the Commodore 64 and 128, including Doodle, Print Shop, Newsroom and Koala Paint.

DPaintIIE—This format is used by the PC version of DeluxePaint (DeluxePaint II Enhanced), and it supports up to 256 colors. The files, which can be directly loaded into the AGA version of DeluxePaint IV on the Amiga, are typically identified by the .lbm extension.

GIF—Graphics Interchange Format for Compuserve's national telecommunications service. It supports up to 256 colors and is common on all computer platforms. There are two formats; the original 87a and the newer 89a. A program that can read the newer version also reads the older.

IMG—Image format used under Digital Research's GEM operating system. Originally produced by Gem Paint, it supports up to 8 bits. There are two types, old style and new.

MAC—Two-color format used by the original Macintosh. Converted images usually need their aspect ratio adjusted due to the Mac's square pixels.

PCX—Used by Z-Soft's PC Paintbrush program, it supports up to 256 colors.

PPM—A type of universal format popular on many systems (primarily workstations). It is part of a standard that includes PBM for black-and-white images and PGM for grayscale images.

SunRaster—Used on the Sun workstations, it can support up to 32 bits.

Targa—Used by the TrueVision Targa graphics boards

available for both the Mac and the PC, it supports up to 32 bits. Files can be identified by the extension .tga.

TIFF (Tag Interchange File Format)—It supports up to 32 bits, is the most popular format on the PC, and is also used on Mac and Sun workstations. It also has the most variations, so it is quite difficult to convert. Files can be identified by the extension .tif.

There are a number of conversion utilities. Several have easy-to-use interfaces:

Convert (v2.7) was written by Ben Williams of Imagemaster fame. Besides loading a bunch of obscure, older Amiga formats, it loads GIF and DPaint IIE files. It also is supposed to load TIFF and TARGA files, but I could not get that to work on my system. You can use it from the CLI with scripts or through the Workbench with a point-and-click interface. It saves all images in a very vanilla IFF-24 format, so it is also useful for fixing IFF-24 images that will not load into the Toaster because they are slightly off specification or uncompressed.

HAMLab Plus was written by J. E. Hanway and is available as a demo version with an image size limit of 512x512. Images larger than that will be cropped. If you send in your shareware fee, you'll get the version without this limitation. HAMLab Plus can load TARGA, TIFF, GIF, PPM, SunRaster files (both compressed and uncompressed), uncompressed BMP files and seven other formats. Support for additional formats can be added with filters as they become available.

Andrew Bond's *TIC* (The Image Converter) handles a number of older formats. It converts MacPaint files, Neochrome and Degas Elite, IMG, PCX, and even Doodle and Koala Paint formats. It has an easy-to-use interface, is fast and works quite well.

Bert Wynants' *TIFFView* sits on your Workbench as a tiny window that lets you load up to 32-bit TIFF images. It can display and save the images in up to 256 colors with several dithering choices. However, you need the AGA chipset to view images in 256 colors on your system. It also loads MacPaint and GIF images (both 87a and 89a).

Some of the other utilities can only be used from the CLI, which makes them a little harder to use; but they can be used in scripts and directory utilities like Opus for batch processing.

Steven Reiz's *Wasp* (2.0 or better), like HAMLab, will also convert and write PPM files without the size limitation. It supports GIF (the older 87a only) and monochrome SunRaster files, and the HAMLab HL2 temporary filter format, among others. Its claim to fame is speed.

Harry Callesis' *PicChange* converts Atari ST Degas, Degas Elite, Neochrome and Tiny picture formats.

B. Conrad's Apple2Amy collection of Apple graphics converters can convert Apple monochrome and color high-resolution pictures as well as monochrome double high-resolution.

Workbench 3.0 on the 4000 uses data types to allow any data-type aware program to load image formats for which there is an appropriate data type, just as if they were an IFF file. MultiView is a good example of a data-type aware program, and you can use it to load an image into a scalable window and save

continued on page 51

Win a Bernoulli Box 150 Removable Disk Drive!

Complete this survey and you will be entered in our free drawing for a Bernoulli Box 150 Removable storage system, including five 150MB storage disks! Just complete this survey in its entirety and return it to *Video Toaster User* by May 15, 1994. You can return your form by fax or mail. If you prefer not to tear up your issue of *Video Toaster User*, you are welcome to send in a photocopy. Fax your forms to 408-774-6783. Mail your forms to Video Toaster User Drawing, 273 N. Mathilda Ave., Sunnyvale, CA 94086. The winner will be notified by phone and mail.

Do you currently own a Video Toaster? If yes, what model? (Check all that apply)

☐ Yes ☐ No

Model:

☐ Toaster 2.0 ☐ 3.0 upgrade ☐ Toaster 4000

Do you plan to buy a Toaster in the next 12 months?

☐ Yes ☐ No

What is the primary function of your Video Toaster?

☐ Live Switching ☐ Post Production ☐ 3D Animation
☐ CG ☐ Paintbox ☐ Still store

What tape format do you use most in your productions?

☐ Betacam ☐ 3/4" ☐ VHS ☐ Hi8 ☐ S-VHS ☐ MII

What is most important when you buy a removable storage system?

☐ Disk capacity
☐ System price (drive plus disk)
☐ Disk price
☐ System reliability
☐ System performance

How would you use a removable storage product?

☐ Sharing files
☐ Backing up a hard drive
☐ Archiving files
☐ Cross platform exchange
☐ On-line animation or audio

What is the total cost of your Toaster production system?

☐ Less than $5,000 ☐ $15,000-$20,000
☐ $5,000-$10,000 ☐ $20,000-$25,000
☐ $10,000-$15,000 ☐ $25,000 or more

Do you own a video Camera? If yes, what is its value?

☐ Yes ☐ No

Value:

☐ $1,500 or Less ☐ $5,000-$10,000
☐ $1,500-$3,000 ☐ More than $10,000
☐ $3,000-$5,000

Do you plan to purchase a video camera in the next 12 months? If yes, what is the amount that you plan to spend?

☐ Yes ☐ No

Amount:

☐ Less than $5,000 ☐ $15,000-$20,000
☐ $5,000-$10,000 ☐ $20,000-$25,000
☐ $10,000-$15,000 ☐ $25,000 or more

How much do you or your company plan to spend on video equipment in the next 12 months?

☐ Less than $5,000 ☐ $15,000-$20,000
☐ $5,000-$10,000 ☐ $20,000-$25,000
☐ $10,000-$15,000 ☐ $25,000 or more

What type of computer are you likely to buy next?

☐ Amiga ☐ IBM PC/Other PC
☐ Macintosh ☐ Other _____

Which of the following computer platforms do you use at work or at home?

	Work	Home
Amiga	☐	☐
IBM PC/Other PC	☐	☐
Macintosh	☐	☐

Other (please specify)_____

What is the total cost of the computer systems checked above?

☐ Less than $5,000 ☐ $15,000-$20,000
☐ $5,000-$10,000 ☐ $20,000-$25,000
☐ $10,000-$15,000 ☐ $25,000 or more

How much do you or your company plan to spend on computer equipment in the next 12 months?

☐ Less than $5,000 ☐ $15,000-$20,000
☐ $5,000-$10,000 ☐ $20,000-$25,000
☐ $10,000-$15,000 ☐ $25,000 or more

Have you had any training in the use of the Toaster? If yes, what type. (check all that apply)

☐ Videotape ☐ Seminar/Workshop
☐ Local Dealer ☐ One on one instruction
☐ Book

Would you attend a training seminar in a resort location (i.e., Hawaii, Bahamas)?

☐ Yes ☐ No

Where did you get this copy of *Video Toaster User*?

☐ Subscription ☐ Newsstand ☐ Bookstore ☐ Pass-along

Store_____City_____State_____

Would you like to receive a sample copy of *LightWavePRO*, the newsletter for serious LightWave animators?

☐ Yes ☐ No

Would you like to subscribe to *Video Toaster User*?

☐ Yes, bill me $36.00* for 12 issues!
☐ No

Please Print or Type

Your Name: _____

Your Title: _____

Company Name: _____

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City: _____ **State:** _____ **Zip:** _____

Phone Number (Daytime): _____

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The winner will be notified on May 20, 1994. Contest entries must be received no later than May 15, 1994.

**$36 within the U.S. Canadian subscribers will be billed $56 U.S. International subscribers wil be billed $76 U.S.*

AEPMS

it out again in IFF format. I have so far found data types for BMP, GIF, JPEG, and PCX formats.

One of the hottest new formats is Kodak's PhotoCD, which lets you develop film directly to CD-ROM. To access these images, you need a PhotoCD capable CD-ROM drive (preferably multi-session, which lets you add additional images from several rolls of film to the same CD). The Photo CD stores the images in five resolutions: 128 lines by 192 pixels, 256 by 384 pixels, 512 lines by 768 pixels, 1,024 lines by 1,536 pixels and 2,048 by 3,072 pixels. Both 1,024 by 1,526 and 2,048 by 3,072 are stored in a proprietary compressed format that reduces the 18 MB files to about 4.5 MB.

It costs between $1.50 and $3 to store pictures that have already been developed on a PhotoCD. You can also take a role of film and have it developed directly onto PhotoCD. This is generally less expensive per image.

As of this writing, Kodak has shown an aversion to supporting the Amiga, although Amiga developers such as ASDG are working to add PhotoCD capability to their products and some of the commercial Amiga CD-ROM driver software have PhotoCD converters.

PhotoCD images can be rendered directly into OpalVision, but since that card uses the same slot as the Toaster, it's not very useful to Video Toaster users. There is another way, but it's a bit awkward and roundabout. You need to use Hadmut Danisch's *HPCDtoPPM*, which can read all of the resolutions and convert them into a PPM file. You can then use Wasp to convert the file to an IFF-24 to load into the Toaster.

Some of you with '040 boards may discover problems with some of the freely distributable programs floating around. I recently talked to someone who had system crashes when he tried to load a PowerPacked compressed text file using the PPMore text reader on his '040, even though I have tried it on other '040s without a problem. There is a simple solution for programs that crash when you try to load them. Try turning copy back off in your '040 control software. In most cases, this solves the problem entirely.

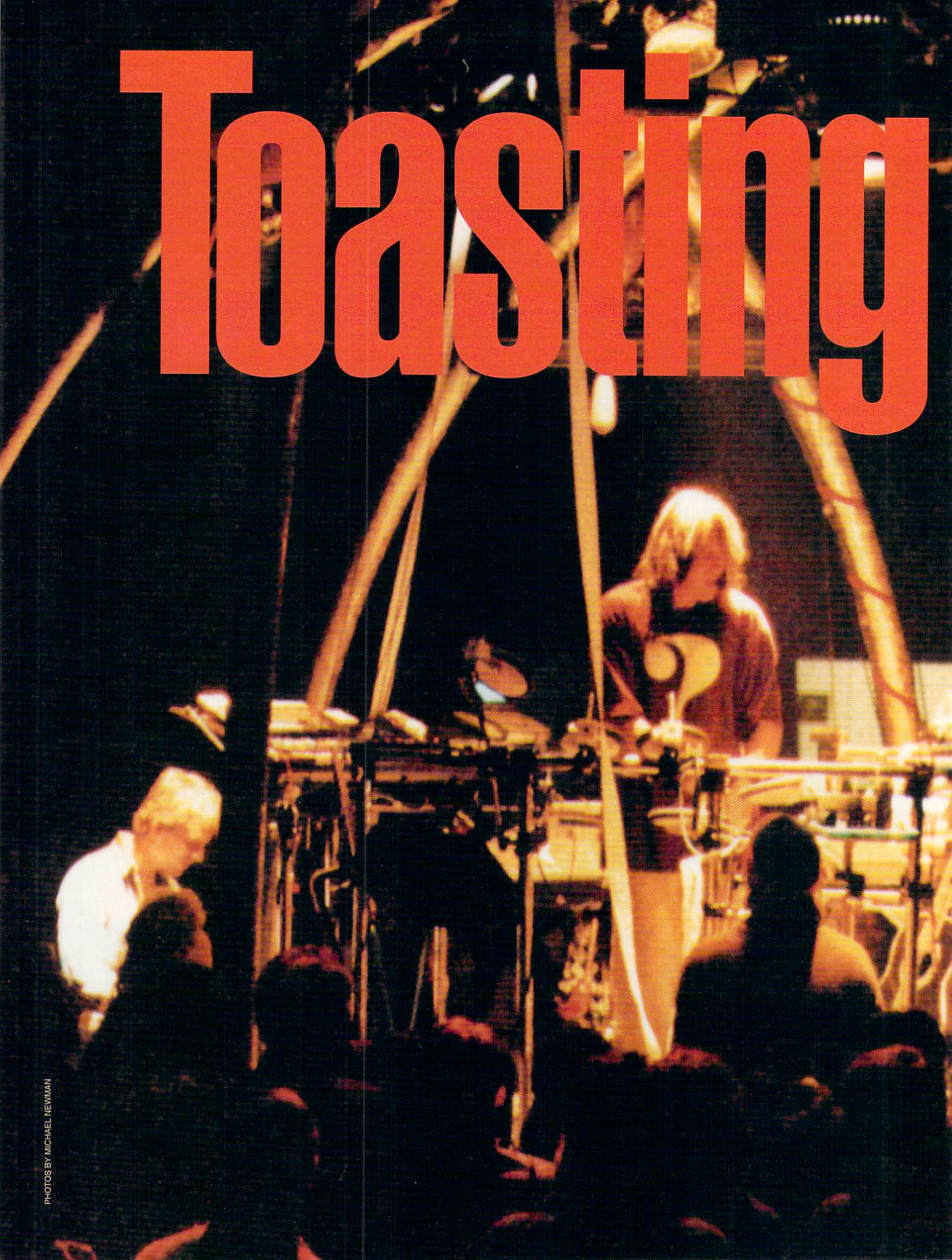
Difficulties have also been experienced with some public domain background utilities trashing the Modeler screen, forcing you to remove them from your system. While the Modeler screen with the Toaster 3.0 software still comes up trashed, it will refresh itself to a usable state. However, screen blankers are still a no-no.

Whether they write it as a precursor to a commercial product, as shareware, or simply for themselves, the people who write freely distributable software provide a valuable service. However, they don't always know what we require. If you have a need or an idea for a particular type of utility, drop me a line. If you are a programmer and have written a Toaster-related utility, I'd allso like to hear from you.

VTU

If you don't have the time to hunt down all of these utilities, I've packed them on a disk that you can get for $5 by writing to: Geoffrey Williams, Translation Disk Offer, 1833 Verdugo Vista Dr., Glendale, CA 91208.

Toasting



PHOTOS BY MICHAEL NEWMAN

with Todd

by Brent Malnack

Musical pioneer Todd Rundgren has always been a trailblazer. What you may not know is Rundgren is also known as a music video visionary. Long before the Toaster and desktop video, Rundgren was producing music videos with a studio of what was considered state-of-the-art equipment. His stage shows have included a pyramid and a full-scale Harley-Davidson with a drum kit mounted on it.

His live shows are an extension of the strong emotional themes which inspire his music. Rundgren's musical and visual programming endeavors have constantly pushed the envelope of existing technologies. His latest project is a CD/CD-I disk that combines his talents in all three areas. Entitled *No World Order*, Rundgren wields the power of the Video Toaster in the creation of his music videos, and onstage during his one-man interactive stage show.

Similar to his tour in the mid '70s, Rundgren performs solo, replacing tape machines with a sophisticated array of MIDI (Musical Instrument Digital Interface) sequencers all orchestrated and controlled by himself. Now, with the Toaster and his animation company NUtopia, he is producing entire videos, too.

Rundgren's interest in the Toaster began at the Dallas SIGGRAPH Show in 1990, just prior to its release. Spending an enormous amount of time in NewTek's booth quizzing LightWave creator Allen Hastings, Rundgren had wondered if the Toaster could be the primary tool for his video *Change Myself*.

As it would turn out, NewTek was willing to cooperate and over the course of the next few months, LightWave 3D was expanded enormously to meet the task. As a result, *Change Myself* became an impressive four-minute animation created and processed entirely with LightWave.

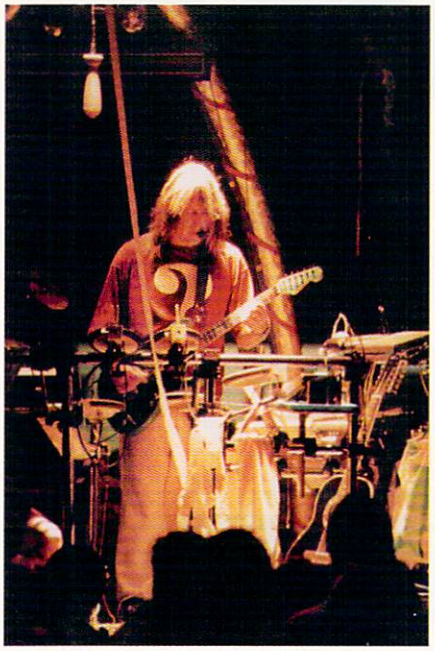
After the *Change Myself* project, NewTek and Rundgren joined forces to create NUtopia. The goal of the partnership was to produce animations for both NewTek and Rundgren. As a result, the first project from NUtopia is the yet-to-be finished music video extravaganza, *Theology*. Although not as widely seen as *Change Myself* (the piece has never been part of NewTek's promotional tapes in its entirety), it has been shown at a few recent NewTek product announcements. As LightWave matures, so does *Theology*.

Early on, Ron Thornton (of Foundation Imaging and *Babylon 5* fame) was involved in *Theology*'s development. Thornton's role has since been handed over to NUtopia's animators, Eric Myers and Til Krueger. Toaster 4000 owners may recognize their work; they created the animation of the twisting toaster.

Toasting with Todd

Taking a break from the *Theology* project, NUtopia went to work on the cover art for Rundgren's latest release *No World Order*. A handful of the choices for the cover actually made it into the CD jewel-box art. Shortly after designing the cover, work began on two music videos for the album, *Fascist Christ* and *Property*, the latter of which found its way onto MTV, VH-1 and NewTek's latest promotional videos.

Fascist Christ is a combination of animation and video segments, while *Property* is one continuous animation, much like the earlier video for *Change Myself*. Although the animation for *Change Myself* took nearly four months to produce, the *Property* video was created in a mere five weeks, using the same 12 Toasters in NUtopia's rendering farm. The increased productivity resulted from improvements to LightWave and the honed skills of the NUtopia animation team.



Todd Rundgren at the controls of his interactive concert stage.

As if the video projects were not enough, Rundgren has put the Toaster to the test in an entirely new way. His current tour in support of the *No World Order* release is intended to be an interactive experience. The one-man show utilizes the latest in music and sequencing technology in addition to five Video Toasters. The Toasters are part of a multimedia stage show unlike any ever performed.

The stage consists of a disc roughly 12 feet in diameter and three feet tall. Set in the middle of the auditorium, the design encourages interaction and an exciting up-close and personal view of the performer—so much so that Rundgren establishes ground rules before the performance begins.

Above Rundgren's head is a beacon which is used like a traffic signal. When the beacon is red, it signals that the stage belongs only to Rundgren. As it glows yellow, the stage is open to Rundgren and his three female dancers. When green, the audience is able to dance around the stage, although not directly where the equipment is.

At times during the performance, Rundgren joins the crowd in a circular dance. Wearing a microphone headset, he is free of any wire tangles. "I want to further blur the lines between the audience and the performer with this tour," said Rundgren in commenting on one of his goals for the show.

Encasing the stage is a steel cage arched in a Gothic shape which is crowned by 24 monitors encircling the top of the structure. Six four-monitor matrices contain one full video image which is repeated so the audience can view video output from all angles.

continued on page 56

Make It Work for You

There are numerous tips that can be learned from how Todd Rundgren uses the Toaster during his latest concert tour, the most important of which is connectivity.

By using the Toaster's general purpose interface (GPI) trigger, connectivity becomes a powerful tool. When also combined with Toaster sequencing software, such as T-Rexx Professional (from ASDG), the Toaster can be triggered by other events. This can be as simple as connecting a joystick to the second mouse port and pressing the fire button to advance a slide show or as complex as having MIDI events control the Toaster, as is the case when Bars and Pipes Professional (from Blue Ribbon Soundworks) is used.

Even setting up interactive kiosks based around a Toaster and a Philips CD-I is not that complex. Adding a Toaster to this environment gives the added flash of having cameras directed at the user and his surroundings, switching back and forth when necessary.

Toasters have also found their way into the live music scene. The group Oingo Boingo has used Toasters in concerts since it was first released. To underscore the live aspect of his performance, Billy Idol's recent *Tonight Show* appearance included a live switch using multiple Toasters. With the advancements in the Toaster software, the power of ARexx and third-party tools, you can build a presentation that is both fun and easy.

When building a presentation with the Toaster, there are a few rules of thumb that can make the job much easier:

1. The easiest way to start is to know what you want to accomplish. If you are creating a presentation for a slide show or kiosk that requires a lot of sequencing, make a storyboard.
2. Figure out the timing. Presentations work best when they are in time with music or audio events. For example, when combining the Toaster with the SunRize Studio 16 audio board, make the Toaster switch on the beat, or at the beginning of a new section.
3. Test the presentation. Once finished, run the presentation through rigorous testing. It can be quite embarrassing when the show must stop due to a technical error. Try the presentation numerous times, verifying that the events trigger consistently, and that by accidentally pressing a key, the mouse, or any other device, that it doesn't stop. If the presentation is tied to MIDI events, be careful not to assign a stop command to an easily reached button or key.
4. Experiment. Try different technologies and link them based on their individual strengths. Almost any computer or MIDI device can be made to work with any other. It simply takes persistence and a little know-how.

VTU

Toaster 4000 FONT SECRETS

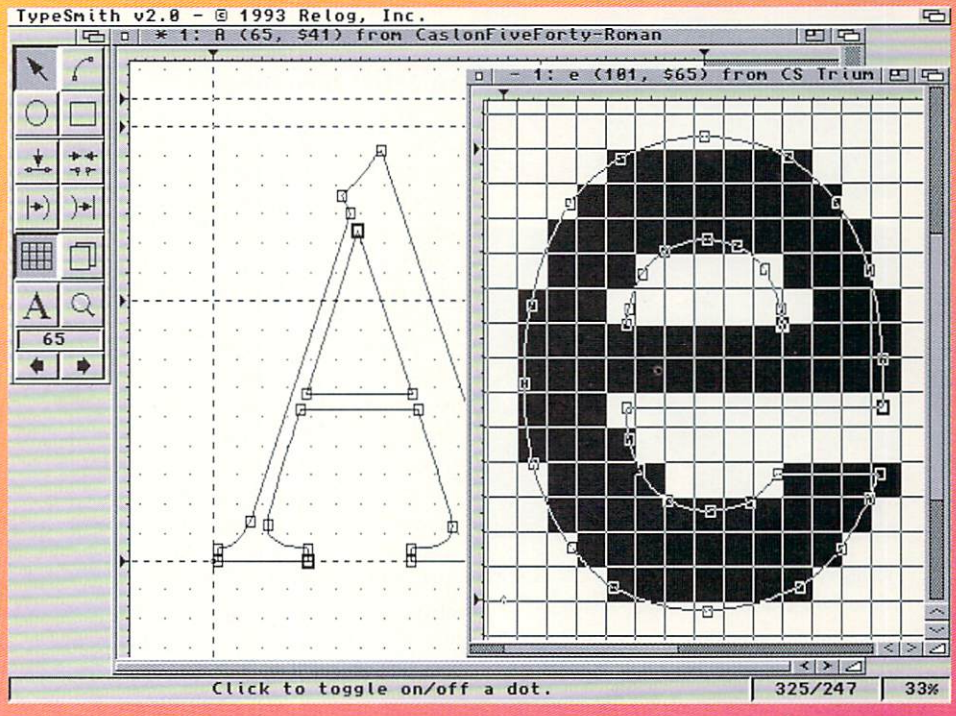
NEW!

Get more than 250 fonts without robbing a bank!

Fonts are too expensive. Fortunately, your Toaster 4000 came with 250 PostScript fonts. But even that isn't enough to offer you or your clients a good selection. Now you can get more without having to spend a fortune. TypeSmith 2.0 is an easy-to-use font editor that allows you to create your own fonts. You can load PostScript and Compugraphic Intellifonts, edit them as drawings, and convert between formats. You can even open multiple fonts and copy and paste characters between them!

TypeSmith 2.0 has an autotracer that will turn your bitmap pictures and scans into outline font characters, plus a character generator that turns outline fonts into bitmap fonts. If your other computer is a Mac, TypeSmith 2.0 can load Macintosh format PostScript fonts and convert them for use with your Toaster. It can also load Windows PFM files and save them in AFM format. And TypeSmith's professional hints will make your fonts render better than ever.

TypeSmith 2.0 has it all—font editing, conversion, bitmap creation, autotracing, ARexx, and hints—and it's your link to Mac and Windows fonts.



"...it's a must." — *Amiga Format*
"TypeSmith is a must-have... I give it my highest recommendation." — *Amazing*
"TypeSmith is a must-have for Amiga typographers and video titlers." — *Compute!*
"...it's good. Extremely good. ★★★★★" — *Amiga Shopper*

How much to end font hell?

Less than you would think. The suggested retail price is $199.95, which is about the same as one font family from Adobe. And for a limited time only, Toaster owners can purchase TypeSmith 2.0 for only $125 directly from Soft-Logik Publishing. That's a savings of 37%.

How much for font nirvana?

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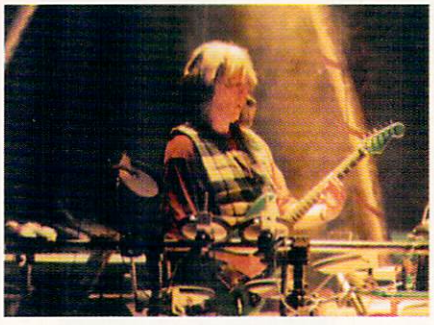
Multiple cameras and video sources feed the video monitors—a Toaster for each quarter of the display, and motion video from a Philips CD-I player with the optional MPEG video board. (Philips is sponsoring the tour.) One camera is focused on Rundgren, while two others are suspended from the top of the structure and lowered into the crowd from time to time by him. Also suspended from the steel cage are a dozen flexible plastic tubes extending over the crowd. Each of these fishing-pole devices has bait (an inflatable creature, etc.) which Rundgren lowers at intervals for the crowd to play with. This scene makes for some pretty interesting video, as each participant close to the stage jockeys into position for his 15 minutes of fame.



Rundgren (top photo) jams in the midst of a live video show, complete with Toaster effects (bottom).

A MIDI-Based System

The sound setup is simple; it consists of four strategically placed speaker stacks sitting on the auditorium floor facing inward. This makes the sound above the floor level somewhat muddy.

During the performance, events are controlled onstage by MIDI. The video segments are comprised of footage from Rundgren's *Utopia* days and animation sequences from more current projects. The Toaster-driven visuals are outstanding. Not only is the video quality of the Philips CD-I surprisingly good, but seeing the Toaster effects in a non-Toaster environment is refreshing.

In addition to the Toasters and cameras, the Vari-Lights that are directed at Rundgren, the crowd and the three dancers encourage participation, entertain and provide crowd control. A MIDI light controller runs both the sequencer and the main MIDI controller keyboard, so they can be changed at any time. Likewise, the video footage from the Philips CD-I player is actively controlled from both the sequencer and the MIDI controller keyboard, so any footage that Rundgren wants to bring up can be instantly displayed on the Toaster.

At the same time, the Toaster Switcher is busy alternating between the video footage, video from the camera in the crowd and the onstage camera pointed at Rundgren. The viewer can watch Rundgren, the dancers, crowd, light show or move down onto the main floor and become active participants in the experience.

How does this show work? At the heart of the system is a Macintosh which controls nearly everything from the sequencing software. "Initially, we tried to set up the show with Bars and Pipes Professional, which was working well with the Toaster. We ended up having trouble controlling all of the other equipment, so we had to switch to a Mac," said NUtopia's Myers. Additionally, proprietary software was needed for some tasks. The CD-I player didn't have the necessary software control to allow it to be triggered by MIDI events. "We had to write some software to handle some of the more unusual tasks, but it wasn't that difficult," added Myers. The cameras and video equipment are all synchronized via Digital Creations' Kitchen Sync TBCs and the genlock adapters.

Since Rundgren works as a solo performer, all backing vocals have to be recorded into a sampler. These sometimes large arrays of voices are triggered automatically in the sequencer, providing Rundgren the appropriate accompaniment at the right time. The instrumentation is provided in numerous ways, but comes primarily from the sequencer. Throughout the performance, Rundgren plays keyboard, guitar or percussion. During his popular number *Bang The Drum*, audience members are selected to provide the percussion, each given drumsticks and offered a chance to do a lead by pounding on the perimeter of the stage.

This interactive one-man show can have its ups and downs. "[By relying] on technology, if something goes down it can really interrupt the performance," Myers said. But despite the problems that can arise when using state-of-the-art equipment, it appears that the Toaster will create a virtual palatte for unlimited creative expression for artists like Rundgren. If his current material is any indication of what lies ahead, it's bound to be interesting—for all who choose to participate.

VTU

Interactive CD

Rundgren's latest release is available in the traditional audio formats such as tape and CD, and a new one, Philips CD-I. This interactive disc allows the user to create an almost infinite number of variations of *No World Order*.

With proprietary software developed by Rundgren and David Levine, any number of musical clips can be placed in various orders, allowing the user to create their own version of the song. Also, versions of the songs without vocals were recorded so that instrumental pieces could be created as well.

The software front end can also play pieces of the CD based on descriptions such as happy or thoughtful. Using artificial intelligence, Rundgren has opened the musical experience further than in traditional methods. The listener actually takes part in the experience, obtaining what they want from the arrangements.

Also included on the disc are remixed versions of the *No World Order* tracks from big-name producers such as Don Was, Bob Clearmountain and former Talking Heads member Jerry Harrison.

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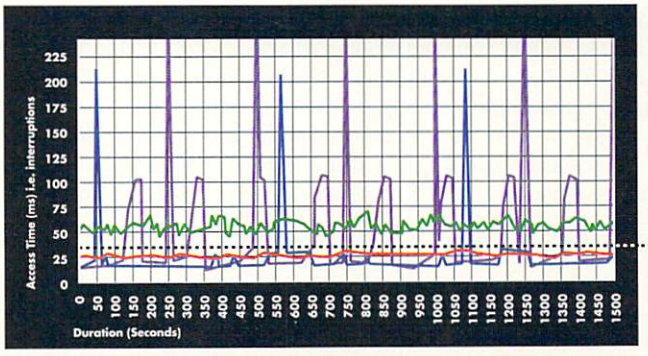

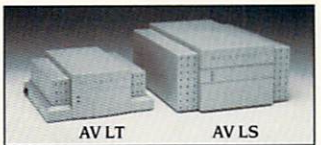

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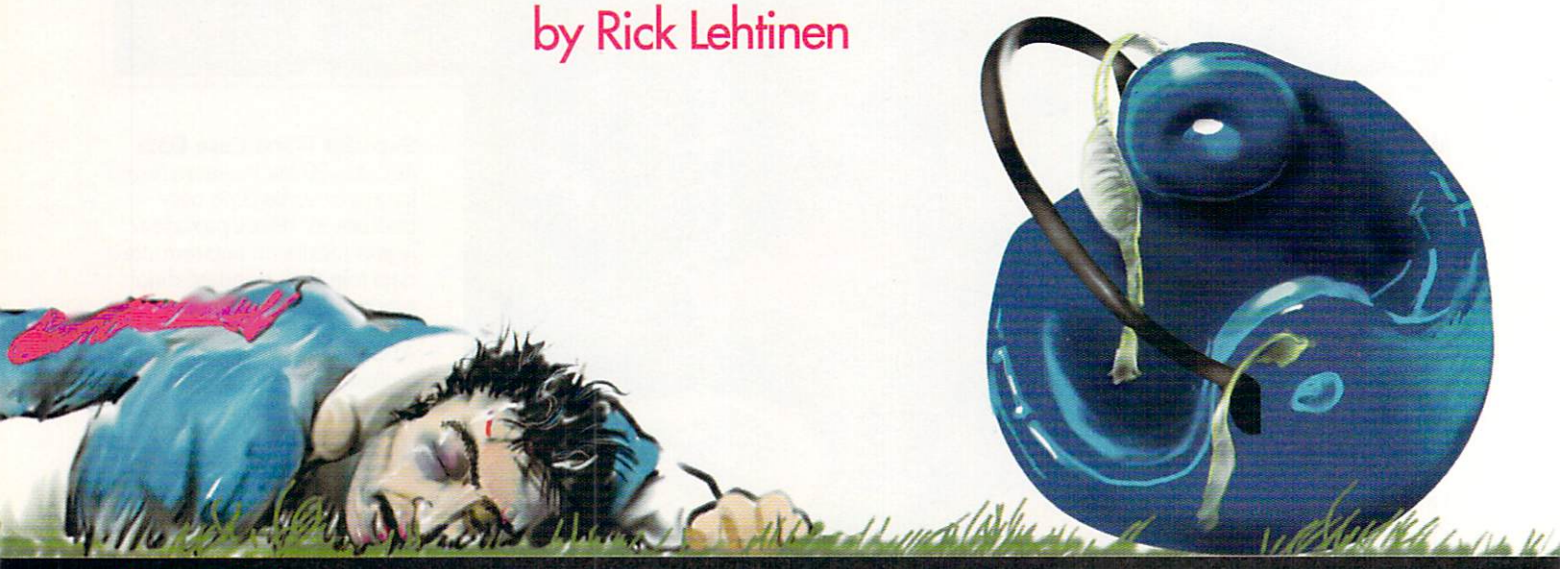
To the Victors Go the Spoils

The Forces That Shaped HDTV

by Rick Lehtinen



Commentary

It is October 1989, and I am in the Washington, D.C., office of James McKinney, chairman of the Advanced Television Systems Committee. We are discussing the future of high-definition television (HDTV) in the United States. McKinney is playing his cards close to his vest. The conversation, although friendly, sticks to the party line: It is imperative, McKinney says, that this country enter the HDTV race, and in fact take the lead. It is in the national interest.

For five years now, I have followed the development of the oft-touted and somewhat unimpressive version of HDTV. The course of HDTV has taken many turns, from giddy speculation to outright pessimism.

In many ways, the emergence of HDTV has resembled a fumbled football on a rainy day. The ball has squished and squirted from team to team, the rain has made it hard to see and the mud flung around has obscured the players until it is hard to know who, if anyone, is on top.

As I watched the events unfold, I formed my own opinion: HDTV is a sham. It started as a marketing ploy, an attempt to create some consumer demand for a series of products when there was no real need. As the game played out, new players entered the league, making the prospects for the original promoters bleak.

As it stands today, stirring up the HDTV horses and hoping the public would hitch its wagon to them may have been the undoing of TV as we know it. HDTV may end up being the vehicle the telephone and cable companies use to make the terrestrial broadcasters go dark.

These are strong statements, especially from someone who is bullish on technology. But this is my insight on what has happened. This commentary is my attempt to penetrate the HDTV hype and explain the darker, lesser-known side of the story.

The Early Days

The roots of HDTV can be found in the first third of this century in the laboratories of television pioneers, such as Philo Farnsworth and Vladimir Zworkin. Television, as they envisioned it, was large screen and full-color. Their goal was to make the home viewing experience as close to the neighborhood cinema as possible. A scribble in Farnsworth's notebook explains that monochrome was developed first, because color would be horribly complex and would have to wait.

A monochrome television service was launched in this country in the late 1930s but was set aside during World War II. After the war, the country began a massive program of normalization and rebuilding. TV began to grow again.

It took until the 1950s for a color system to be standardized. Demand was high, because the consumer saw color in cinema, in photographs and on

35mm slides. Originally, color television was to use the Columbia Broadcasting System (CBS) system. It worked (don't laugh) because of an optical illusion formed by peering at a monochrome screen through a whirling disk with holes in it.

This system did not win wide industry acceptance because it was unwieldy and the decision to use it came from the top down. It smacked of a political fait accompli. (The system had essentially won FCC approval before its critics had a voice.) Among other complaints, there was widespread concern that the whirling disks would limit the potential screen size, although some later research showed the potential of replacing the disk with a wide moving belt.

As a grassroots answer to the bureaucratic camel being forced upon it, the industry quickly reconvened the National Television Systems Committee (NTSC), a body that had fallen quiet during the war years but had once formulated the parameters of early monochrome television.

The NTSC crafted an ingenious method of interleaving a color subcarrier into the monochrome video signal. Although it would not be perfected for more than three decades, the NTSC system was the first to provide color television and make it backwards compatible (without whirly discs). That is, it could operate with existing monochrome sets and TV broadcast infrastructure. Today, NTSC color serves the United States, Canada, Mexico, Japan and a few other nations.

European Color

While TV color in this country was sort of an industry reflex to a government gaffe, the color system in Europe came about because of a more understandable force: greed. Faced with the prospect of paying royalties to U.S. firms or developing its own TV systems, Europe went its own way—actually, two ways.

As soon as NTSC had won approval, U.S. manufacturers went overseas with a missionary zeal. The reason was simple: Europe was a big market and replacing all of its monochrome TVs and production equipment would mean lots of sales. Production van after production van went on European demonstration tours. Of course, NTSC was still new, and the equipment didn't work very well. The nickname Never Twice the Same Color was soon hung on the acronym NTSC.

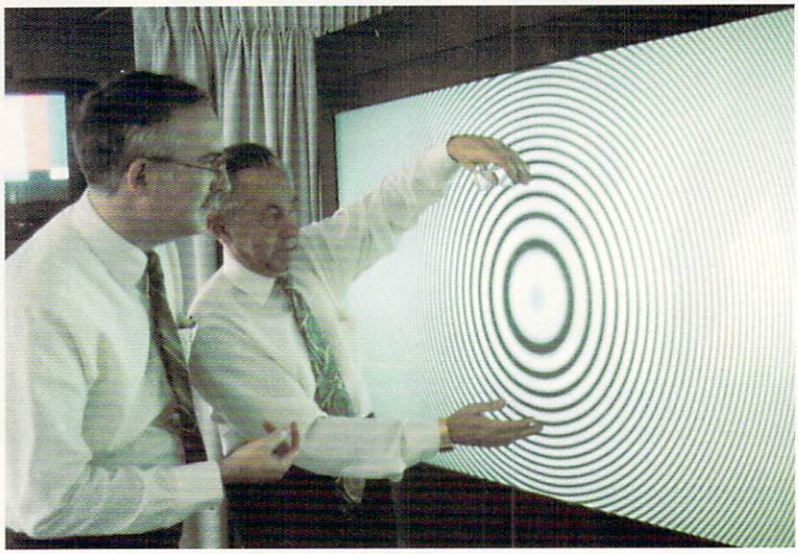
NTSC was allowed to compete in the race to become Europe's color system, but it lost. By adding a few extra goodies to the TV signal, the Europeans turned NTSC into the Phase Alternate Line (PAL) system. PAL, which had the advantage of keeping the image colors more consistent than the U.S. system, also kept profits at home.

The French wanted to share even less. Instead of casting with the rest of Europe, the country came up with a system called SECAM, which was used only in France, its territories and the Soviet Union. This was supposed to increase the amount of resistors, capacitors and picture tubes the French could sell to themselves. The aftermath of this move has been instructive and

should have served as a harbinger for the keep-HDTV-at-home-for-national-interests fraternity.

SECAM, while delivering a technically superior picture for a few years, was so unwieldy to edit that production nearly always took place in film or using PAL followed by standards conversion. The SECAM market was so narrow that the demand for production equipment never really materialized. Worse, SECAM provided a lock on the TV receiver market for only a few years. Eventually, this was lost to Asian manufacturers, producing multistandard TVs and VCRs.

Thus, what started out as a French protectionist measure may have eventually cost an industry and marooned the country's populace in a technical backwater. The same protectionist factors reared up again when the United States went shopping for an HDTV system. This time, the results may be much more cataclysmic. The loser may end up being broadcasting itself.



The Advanced Television Testing Center employs various tests to evaluate competitive HDTV systems.

The Old Boys

"We had imagined that there would be some board or organization that would approve the new HDTV technology. Instead, I found myself in a room with 100 people, all of whom were my direct competitors. We all stood around and lobbied our systems to each other, that is, to people whose vested interest was in seeing that no system besides their own was picked... There was a lot of shouting and sometimes nearly fist fights... At one point, a Japanese gentleman rose to his feet and said that this was the most unprofessional meeting he had ever seen."—Kathryn Gerdes, former HDTV system proponent.

There have been many casualties in the quest to provide wide-screen television. Some of these wrecks were disasters waiting to happen. The proponents' systems were not well thought out, nor did they offer much benefit. Other casualties were a pity. These proponents offered good ideas, but were sidetracked by a lack of development capital.

However, the most insidious losses were those systems that had the tires shot out from under them. These systems had real promise; in fact, two of them had actually been tested and shown to be feasible. They were run off because of their potential for making HDTV work inexpensively; also the proponents weren't part of a small clique of established manufacturers intent on keeping the HDTV pie for themselves.

Among the initial players in the HDTV race were the Japanese Broadcasting Company (NHK), David Sarnoff Research Center (for NBC), North American Philips, and Zenith. In addition to the mega companies, a host of smaller groups proposed interesting systems. Among them were Production Services, High Resolution Sciences, Faroudja Labs, UVC, the DelRay Group, New York Institute of Technology and the Media Lab at MIT.

Several proponents, notably the small ones, had truly exciting ideas. Richard and Kathryn Gerdes' Genesys system (Production Services) was probably the first use of neural network techniques for information transmission. John Music's (UVC) system mathematically described the video signal as a series of formulae, then sent just the formulae. William Glenn (NYIT) sent the main video on one channel, and an augmented signal with extra detail on another. Richard Iredale (DelRay Group) had a system that was fully digital, and Yves Faroudja (Faroudja Labs) showed the world what line doubling was.

I found it interesting that the most innovative ideas were coming from the smaller companies. I sensed a genuine enthusiasm for the process, as if contributing even a part of the HDTV system would be almost a patriotic joy.

However, it soon became apparent that the system proponents fell into two groups—the Old Boys and the Newcomers. You could tell them apart because the smaller birds were quickly squeezed out.

FM Redux

Considering billions of dollars and years of royalties were at stake, it should not come as a surprise to learn that the selection process was not completely fair. Subterfuge is no stranger to entertainment electronics, and system proponents have a history of playing rough. A classic example is the debate over FM radio. "Major" Edward Armstrong sensed that FM had the potential to be a superior service to AM. (In an AM system, spectrum noise and desired signals look identical to decoders.) However, AM was in its heyday, and RCA, which owned not one radio network, but two, was not interested in having its cash cow threatened.

"General" David Sarnoff and other opponents kept the lid on FM for as long as possible. When it could no longer be held down, they stopped opposing FM directly, but lobbied for it to occupy a band of frequencies far above the then-usable range. FM got its homestead in the RF hinterlands, up around 100 MHz. The service languished for years until semiconductor technology finally made FM affordable to the masses.

Eclipsing AM, FM's popularity eventually soared. One may only wonder what course the home entertainment industry may have taken if FM had not been so aggressively held back.

Similarly, one could sense the presence of a big thumb on the development of HDTV. It was as if the old boys wanted to discourage any new blood

from entering the race. As we shall see, when they couldn't win on technical merits (most of the old boys were promoting technical rehashes of NTSC), they tried to manipulate the selection process and changed the groundrules when necessary.

New Technology

It is nearly midnight in the summer of 1989. A station four-wheeler is preparing to climb a pitted and boulder-strewn service road to the top of Mount Graham, near Tucson, Ariz. On board: the station director of engineering, an assistant, a representative from the station's group headquarters and two proponents of a radical new HDTV system.

The ride is so rough that the team's equipment bounces too much on the floorboards. They must hold the heavy gear in their laps.

On the mountaintop, they slide the existing modulator out of the TV transmitter and replace it with one specially modified to transparently insert a series of coded bits into the signal. These bits are non-binary. Instead, they carry information by a process based on neural network (fuzzy logic) technology. Because they are so efficient, these new bits have the power to carry an NTSC signal in a fraction of the bandwidth that would normally be required. The developers estimate that there is enough headroom in the new bits to insert an HDTV signal into an existing NTSC signal. Tonight's test is the first step. They will try to insert a second NTSC signal into an existing one without it being noticed.

When the new modulator is switched on, transmitter power drops about 5 percent, which the station engineers easily adjust back to normal. Signal-to-noise ratio drops slightly but is within FCC specifications.

Down in the valley, observers in the station monitor the off-air signal, looking for artifacts from the second video source. There are none. The mountain team then momentarily detunes the unit, allowing the second signal to show through. They return the unit to normal, and for the rest of the night, they feed several test patterns and video sources, including a satellite feed of a frenetic televangelist. The station observers see none of it, but the folks on the mountain are even able to pick up the coded transmission as relayed by a distant translator.

In defining a national HDTV system, the FCC seems to have taken the middle road. The autocratic whirling disks decision resulted in an industry rebuke. In addition to being embarrassing, this may have fueled the fires of deregulation. On AM stereo, the commission decided not to decide. The ensuing marketplace decision debacle divided the industry over four competing systems, resulting in the death of AM stereo. The decision process for TV stereo had gone much better and seems to have been the model for choosing an HDTV system.

The FCC first requested that the industry set up several advisory committees to develop an industry consensus among set manufacturers, television broadcasters, the defense industry and other interested parties on the HDTV question. When the industry council made up its mind, the FCC would consider and likely sanction the recommendations.

One of the advisory committees was the Advisory Committee on Advanced Television Systems (ACATS).

Another was the Advamced Television Systems Committee (ATSC), which was charged with representing broadcasters and other interested parties. Broadcasters themselves, first under the auspices of the NAB and later as a broader coalition, formed the Advanced Television Test Center (ATTC), in Alexandria, Va. The testing center was responsible for gathering data on each of the proponents' systems.

ACATS held a series of meetings, called the Systems Subcommittee Working Party I (or Hell Week, depending on which side of the table one sat), to solicit proposals for systems, and then screen them. A final, short list would then advance to the ATTC facility for testing. At one point, there were nearly 20 proposals. This shortly narrowed to seven.

While this industry approach may have had some merit, it certainly didn't make it easy to advance new ideas. The working parties became a forum for the hazing of those inventive newcomers who could upset the apple cart. One proponent told me that some of the loudest hecklers approached him after the meeting to apologize, explaining they had been paid to act that way.

More than 20 NTSC television receivers dominate the ATTC viewing room.

Hazing was not the only tool used against newcomers. Others included high and escalating fees, unfair disclosure requirements and illusive inducements.

Fees

Each proponent was shocked by a barrage of unannounced charges that constantly increased. For instance, it was decided that the price to reserve a window of time in which their system would be tested would be a non-refundable $25,000.

Obviously, providing such earnest money was hard for some of the smaller proponents. It was then announced that each would have to contribute an additional $100,000 for the privilege of being tested. In addition, a portion of the ATTC overhead expenses was to be borne jointly by all participants. As proponents dropped out, the remaining group members had to pay an increasingly larger tab.

In the end, just getting tested priced many of the proponents out of the market, so they folded their cards and went home. Most of the Old Boys didn't even have prototypes. They showed up with little more than mathematical models or computer simulations. And none of their systems included any provision for audio—oops!

Of course, testing was only part of the burden. There was also the need for frequent trips to Washington and location expenses during the six-week testing slots. It became obvious that financial staying power, not technical innovation, was to be the name of this game.

Show Me Yours and Then I Gotcha

At some point, it became necessary for proponents, particularly smaller ones, to consider just how they were going to make money in HDTV. When they inquired, they learned that the HDTV system selected would be subject to a complete public disclosure. This information would ostensibly be used to encourage the manufacture of receivers and other appliances.

Unfortunately, this put some proponents at a serious disadvantage. Those with truly advanced technology systems couldn't talk much about their ideas, as their patents had not yet cleared. Some viewed HDTV as just one of several potential applications for their inventions. To air all in the HDTV arena could mean losing all in other areas. Finally, the astute proponents realized that even the most airtight patent was worth only as much as one was willing to spend defending it. Should a proponent reveal his secrets, anyone could lap up the technology, make a trivial improvement and proceed to become the inventor's new competitor. Thus, the FM battle served as the precedent—only companies with many lawyers need apply.

Illusive Inducements

There was also a hint of blood in the water. At about this time, the Defense Advanced Research Projects Agency (DARPA) had announced a $30-million fund for research into HDTV. Many of the developers apparently came to the working party in hopes of securing a part of this funding. They never saw it. It turns out that the DARPA jumpstart was designed to look for HDTV applications with military applications. As a result, what DARPA eventually spent its wad on was a series of grants to research narrow parts of the HDTV equation.

The disappointed proponents dropped out one by one. "The easiest way to restrict your competition is by legislating them out of existence. If you can change the rules, you can keep them away," UVC's Music told me at the time he dropped out. (In fact, Music got out before he was all the way in. The UVC system apparently never was officially numbered among the proponents.) DelRay Group's Iredale wrote an acerbic letter to the FCC, in which he complained that the proceedings seemed rigged against new technologies. He attached a copy of an editorial I had written that decried the selection process.

Certain elements of the media were unkind as

continued on page 64

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The 28MHz Warp Engine comes with an 040 socket, four SIMM sockets and the NCR SCSI-2 Controller. This is a very cost effective entry because the A4000 already has an 040 chip installed and 4 to 16MB of FastRam on the Motherboard. You simply remove the CBM CPU card and then remove the 040 chip and install this onto the Warp Engine. You can also remove the Memory from the Motherboard and install it onto the Warp Engine. This produces a 28MHz 040 Accelerator with 4 to 16MB of High Speed Local 040 32Bit Burst Ram and the fastest SCSI-2 Hard Disk Controller available for the Amiga. You do not need to purchase more FastRam immediately. The Warp Engine provides all of this expansion without using a single Zorro Slot! The 33MHz and 40MHz versions include the 040 Processors. The 33MHz board requires 70ns Ram to work at its highest speed and the 40MHz board requires 60ns Ram although you can insert wait states to use slower Ram.

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All Warp Engines are fully upgradable to 40MHz by just changing the CPU and the Clock Oscillator! The Warp Engine uses standard 72 Pin SIMMs and allows the use of up to four different size SIMMs at the same time (for example you can have a 4, 8, 16 and 32MB SIMM installed together). Unlike other companies that require the use of custom SIMMs that are only available from them, and/or they only allow the same size SIMMs to be installed making it necessary to remove your old SIMMs before you can add larger SIMMs. The NCR53C710-1 SCSI-II Fast 32Bit DMA Bus Master Processor makes it the Fastest available with its' direct connection to the 040 chip - this provides up to 10MB/s Transfers and allows the 040 to retain 90 to 98% of its' Processing Power! Zorro III Memory boards cannot even reach 70% of the speed of the Motherboard Memory while Warp Engines Local 040 Burst Memory is many times faster than the Motherboard Memory!

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Features	WarpEngine	GVP-040/40	Excalibur	FastLane	4091	DKB3128
28MHz, 33MHz, 40MHz Versions	YES	NO	NO	NO	NO	NO
28MHz Upgradable to 33 and 40MHz	YES	NO	NO	NO	NO	NO
Expandable onboard to 128Megabytes	YES	NO	YES	YES	NO	YES
Built in SCSI-2 Hard Disk Controller	YES	NO	NO	YES	YES	NO
Uses industry Standard SIMM Modules	YES	NO	YES	NO	NO	NO
Uses any Combination of SIMMs	YES	NO	NO	NO	NO	YES
Allows use of the Memory from the Amiga	YES	NO	YES	NO	NO	YES
Uses a Zorro III slot	NO	NO	NO	YES	YES	YES
Memory Speed Much Faster than Amiga Ram	YES	YES	YES	NO	NO	NO
Works in Amiga 3000	YES	YES	NO	NO	Maybe	NO
Zorro III DMA or Buster Problems	NO	NO	NO	YES	YES	?

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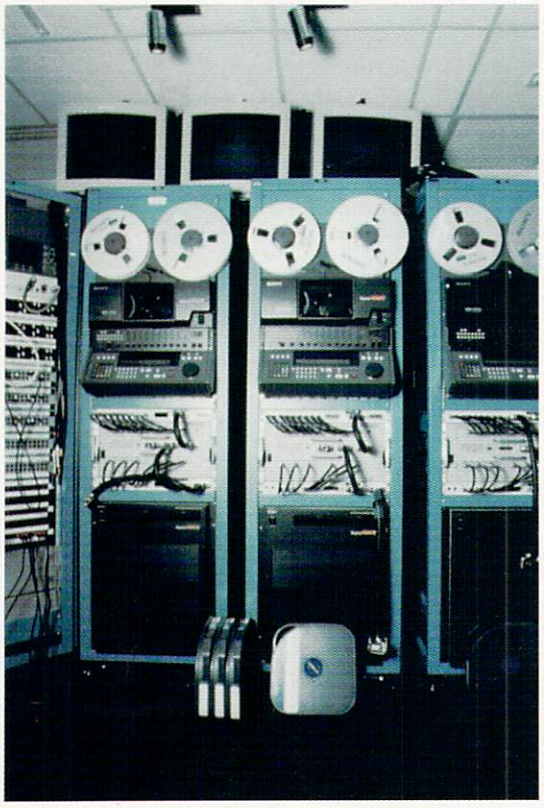
well. One tabloid ran a generally favorable review of the Genesys system (save for a couple of disputed quotes), but chose to run it under a negative headline that cast doubt on the technology.

There never was a table around which the inventors discussed their ideas for new TV technology. When the party was over, the field was left to the Old Boys—the big corporations with lots of money to spend and lots of old ideas.

Tora! Tora! Tora!

It is possible that the entire HDTV selection process to that point was merely an exercise in courtesy, or it may have been a chance to repay the Europeans for being kind enough to consider NTSC as a color system and a chance to let the Japanese fail without losing face. The fact that it extracted a few hundred thousand dollars from the pockets of proponents who were never intended to get into the race is so much the better. Their blood made things look more real.



Three specially designed digital HDTV VTRs record five different scanning formats used in various proposed systems. Thus, all five systems could be compared back to back on the same reel of tape.

Consider this: The most expensive part of a TV's innards is the glass bottle called a cathode-ray tube (CRT). This is followed by the integrated circuits, particularly the microprocessor and special purpose ICs that are unique to demodulating the RF signal and amplifying audio and video. This is followed in turn by the memory chips, the common chips (so-called glue logic) and power supply. As a new TV system guarantees that every one of a country's TVs and most of its production equipment will have to be replaced, it is imperative that companies capture whatever part of the business they can. If they do, they get to sell a lot of components.

At the time the Old Boys opened shop, Europe was already developing two HDTV systems (one in free Europe and one behind the Iron Curtain). Japan had also built and was testing the 1125/60 system.

Either of these systems (ignoring the Russian system due to the Cold War) could have met any need for HDTV in North America. However, it is possible that the wheels started turning on HDTV in the United States not because there was a need for it. (The need is debatable even today.) It is likely that the HDTV consideration process got underway to prevent either Europe or Japan from siphoning off sales revenue by providing the de facto U.S. system.

Japan, in fact, came close. Its 1125/60 production standard gained acceptance from the Society of Motion Picture and Television Engineers (SMPTE) and the American National Standards Institute (ANSI). The Japanese seeded several production firms, in fact several manufacturing entities, with 1125/60 equipment, at incredible expense, just to gain a toehold.

Of course, buying foreign HDTV would have been prohibitively expensive. The Japanese had estimated that the earliest HDTV sets would cost about $30,000, falling with quantity to about the $4,000 range. Should a competitive system have leapt its shores and got a foothold, the dollar drain could have been tremendous.

Having just run off America's best and brightest, the Old Boys were now in the position of having to turn their computer games into a real system. This scared them so much that Zenith actually suggested that Congress enact a law to authorize a tax to support U.S. HDTV development.

Two for One

A former commissioner for the Federal Communications Commission is giving a speech at an assemblage of broadcast engineers in Kansas City, Mo. I have been informed that he has seen a demonstration of an advanced transmission system that is similar to the trial system used on the Tucson mountain. He knows this technology has the potential to inexpensively solve the HDTV problem. Nevertheless, his speech makes no reference to the new technology. Instead, he follows the old line. "These are challenging times for broadcasters... It will cost about $3 million to modify a station to be able to pass HDTV..."

Just at the moment when the Old Boys were tottering in the face of offshore competition, something happened that changed everything. General Instruments stepped up with an all-digital system that did the impossible. It had the potential to transmit two NTSC signals in the bandwidth of one, and eventually transmit an HDTV signal within NTSC's 6MHz bandwidth. (Of course, the fact that one of the recently run-off proponent's system did the same thing was politely overlooked.)

In the early days, the voices of the HDTV establishment all said the same thing. Pure digital television would be 10 to 15 years away. As a result, they advocated rushing into an analog HDTV system and then switching to digital in a decade or so. This notion was completely self-serving. In the first place, locking into an analog system immediately would block offshore HDTV systems. Second, using analog systems at the start could increase profits by squeezing the last yardage out of existing technology, which had already been bought and paid for.

To play this gambit required warding off digital technologies until the analog HDTV train was going too fast to stop. The Old Boys talked hard and fast. Much of their defense took the form of technical garlic, which they tied around their necks to protect the public against charlatanism. One of their chants

had to do with how impossible it would be to cram too much extra information into the existing video signal. In support of this "I-can't-so-I-won't" mentality, their experts cited the works of information pioneer Claude Shannon.

The System Subcommittee Working Party I seemed hell-bent on invoking Shannon's law of information theory to prove that some proponents' claims were implausible. Unfortunately, they did not understand it.

Shannon's law, in thumbnail form, defines the amount of information that can be put into a defined bandwidth while maintaining a specified signal-to-noise ratio. Most of those quoting Shannon apparently took into account only the first two elements, information rate and bandwidth, without considering the impact of signal-to-noise. This created a severe prejudice toward some of the proponent systems.

I do not know why General Instruments joined the Old Boys so easily. It appears they marched in, joined the cartel, and demonstrated digital magic that could break the barriers that had kept the rest of the proponents flying subsonic.

Within about a year, all of the former defenders of the analog faith produced digital systems of their own, somehow shaving nine years off the development process. Many of the proponent companies were also involved in military communications work. The cutting edge was well known to them. I suspect they were sandbagging, saving the best till last. It could not have happened at a better time.

One Brief Shining Moment

The entrance of General Instruments may have been the best thing that could have happened to the U.S. HDTV initiative. By forcing the proponents to play their best cards, the world suddenly looked to the United States once more for the absolute last word in HDTV. Editorials abounded in Europe and Japan about how their governments were wasting money developing second-rate systems that were obsolete before they'd been launched. Whichever new digital HDTV system emerged as the winner, it would be marvelous. (Although no one had yet remembered audio.)

And then a funny thing happened. Everybody agreed to stop putting their best foot forward.

The Grand Alliance

After the first round of tests were completed, there were no clear winners. All of the competitors then got together and agreed to agree. This pax, nicknamed *The Grand Alliance,* gives, or rather takes, something from every proponent's system, and assembles an HDTV collage. This keeps everybody in the royalty loop and does away with the specter of retesting.

The prospect of a second round may have been too onerous to face. On the other hand, the proponents may have been looking to protect their investments. The original specification called for an open window at the end of the testing period, in which more recent proposals could be heard. The easiest way to discourage an untidy reprise of some system they had killed earlier

would be for the allies to gush wildly about one another and publicize it widely. This would give the impression that HDTV was a done deal. They could then hightail it back to the lab to figure out how to make it all work.

The proponents, now partners, outlined five points on which they would need to align. They were: audio, compression, scanning system, transport and transmission. Recent announcements have confirmed that four of the five areas are now in sync.

For audio, the alliance has picked Dolby's AC-3, a 5.1 channel surround-sound system (left, right and center-front, left and right-rear, and an omnidirectional channel dedicated to bass). If AC3 flunks its field test, Musicam is the runner-up, with the MIT system close behind.

The video compression system is MPEG-2, which includes a bi-frame motion compensation system. The advantage of a bi-frame system is that it at least listens to the frames being dropped before consigning them to oblivion.

The scanning system is no longer specified by aspect ratio; rather, it is called out in square pixels. Instead of a fixed number of frames per second, the alliance offers 720 lines of 1,280 pixels each at 24, 30, and 60Hz with progressive scan; 1,920 H by 1,080 V pixels at 24 and 30 frames progressive scan; and 1,920 by 1,080 at 60Hz interlaced scan.

The hope is that the system will eventually be able to squeeze out 1,920 by 1,080 at 60Hz, progressive, but hardware can't do that yet. Some critics have noted that the migration plans are not yet definite enough.

The transport system is 188-byte packets, four of which are reserved for use as a header. Packets are instantly transmittable by the telephone companies and by the cable groups with minor modification. The only group that can't do anything with packets is the terrestrial broadcaster. This leads some to suggest the alliance membership includes those who wish to vote broadcasters out of jobs. At the very least, broadcast will start playing second fiddle.

How about Broadcasters?

The remaining area on which the alliance must ally is terrestrial transmission. There are several proposals, most of which involve sophisticated new modulation systems. The leading contenders so far are not AM or FM, or any other ordinary-M, but exotic schemes, such as 32 QAM (Quadrature Amplitude Modulation), and four- or six-VSB (vestigial sideband) modulation. (NEC says it will show a prototype of this transmitter in the summer.)

Get this, the cable folks will *not* use the same signal system as over-the-air TV. They get one that is arguably better. The cable proposals include 256-QAM and 16-VSB.

Additionally, it may prove extremely difficult for local affiliate stations to insert local commercials into network programming. The Grand Alliance proposal may have a latency (time required for processing) of up to four-tenth's of a second. As it stands, for a broadcaster to insert local commercials into a network feed will require decoding the serial bit stream to analog, find the right spot in which to drop in the commercial, then re-encode the signal for transmission.

This begs the question: Will HDTV receivers for cable and TV be compatible? And remember those packets from the transport system? They will slither nicely down a telephone circuit using the Asynchronous Transfer Mode (ATM) protocol. In other words, between cable and telco (who, by the way, are madly buying each other's shares), the country will have virtually seamless coverage by a wired video distribution system.

What's more, it can be on the air right away. The telcos and cable systems do not have to wait for someone to design and build their transmitters, nor for someone to figure out what frequency they are supposed to operate on. They do not even require retailers to start selling advanced TVs. In several recent HDTV demonstrations, the playback device has been a PC with an S-VGA monitor. (So much for the $4,000 TVs.)

That the broadcaster may be losing his/her slice of pie to this Grand Alliance is one of the unspoken fears of many station owners. It is beginning to appear that broadcasters are inheriting the short end of the stick, especially when you consider the Cable Act of 1992. One interpretation of these new rules is that cable systems can no longer strip a broadcast signal of its commercials and reinsert different ones. The audio and video portion of a TV signal must be delivered intact.

Unfortunately for broadcasters, experts predict that audio and video will be only part of the game in the new TV environment. Data carriage and ancillary services are expected to be a bigger part of the puzzle. There is a high-speed data channel associated with the proposed new HDTV standard, and cable companies may be allowed to strip it out and insert their own.

That the TV stations will take it on the chin is due in large measure to early actions of the Old Boys. A few years ago, it was determined that a television station's most valuable asset was the authority to occupy a 6MHz slice of RF spectrum. Everyone knew that HDTV would require at least twice that much bandwidth. As a result, broadcasters licked their lips about the possibility of obtaining an HDTV channel in addition to their current allocation. One justification mentioned for this RF land grab was the potential of massive sales of new TVs. In other words, by pushing hard for HDTV, broadcasters could lay claim to massive new chunks of RF real estate—and do so in the national interest.

Of course, the land mobile community has a need for an extended spectrum, as does the cellular telephone industry. They saw to it that no new spectrum would be allocated. As it sits today, TV stations anticipate being given a second channel out of the existing UHF-TV allocation, which they will operate in HDTV, in tandem with existing NTSC signals. There are two problems with this plan. First, after a transition period, broadcasters will have to surrender the NTSC channel. This means that for a period of at least a decade, TV stations will have to power not one, but two transmit-

continued on page 68

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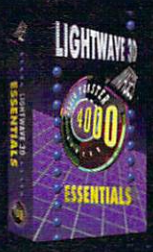

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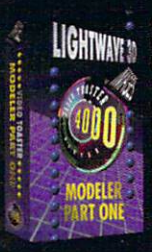

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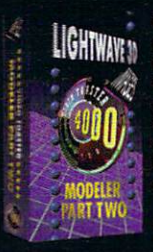

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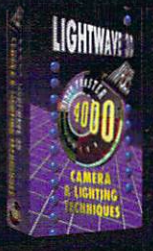

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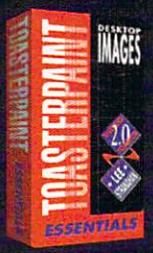

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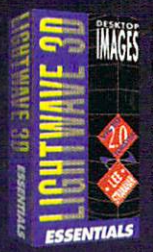

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ters. Power is already one of the biggest expenses at most TV stations. Second, some studies indicate that there is not enough of the UHF spectrum available to grant a second channel to every telecaster. Someone will have to lose. The cable/telco behemoths, on the other hand, will shortly begin offering hundreds of channels of video services.

All of this seems to follow a suggestion attributed to Nicholas Negroponte of MIT. He says that portable services, such as mobile radio, cellular telephone and radio, should be inherently wireless. Fixed services like TV should be wired.

Fat Video for the Little People

In Indianapolis, a skilled technician named Nick is poring over blueprints for a revolutionary new TV set, soon to be introduced in the United States. One such set is on his bench with the back removed. It has an internal framebuffer and is capable of playing back standard NTSC or PAL signals in either 4:3 or 16:9 aspect ratios. It can sense letter boxing and will expand the video to fill the whole screen if the viewer wishes. Further, it has the ability to sense when video is shot through an anamorphic camcorder lens, which captures 16:9 images on a 4:3 tape format. The set reprocesses such images to display in full screen.

Nick works for a French company, Thomson Consumer Electronics. He is fluent in Japanese, which is a good thing. This set is manufactured in Japan and is to be offered for sale in this country under the GE and RCA labels.

Not all of the progress has been in the production or transmission systems. There is progress towards HDTV on the home front as well. In fact, home-based HDTV may see delivery before the commercial systems get off the ground.

Home HDTV uses two technologies, line doubling and anamorphic camcorders. Modern NTSC tuners and receivers do an excellent job of displaying NTSC. Using framebuffer-equipped TVs, the 525-line NTSC image can be doubled into a 1,050 line image in the set. This approximates HDTV in appearance. Of course, there is not more detail (that would require an HDTV source). It is just that we are getting a sharper rendition of the detail that is already there.

Although available in this country, anamorphic camcorders have not yet been widely publicized because there is a shortage of screens that can play them back. An anamorphic lens is similar to the one used to film the classic *Ben Hur*. The glass does the compression from wide-screen to 4:3, resulting in tall and skinny people on tape. In the original movie, the theaters' projectors were equipped with special lenses that spread the image out again. The result was super wide-screen pictures using conventional film media.

The video twist to the technology is to use a framebuffer-equipped TV to resize the compressed image into a 16:9 aspect ratio (line-doubled if possible). Save for the special TV and the trick lens, nothing new needs to be invented to realize this. Any television capable of doing these manipulations is likely to be capable of displaying HDTV, whenever and in whatever form it finally arrives. The broadcaster can even play along by transmitting the tall and skinny pictures associated with the optically compressed

video. (Of course, there are likely to be complaints about tall, skinny actors from those who own conventional TVs.)

The FCC has indicated there will be no interim HDTV standard, and the status of 16:9 NTSC is by no means official, but Panasonic is thinking of it. Its M-II series of decks are 16:9 capable.

What Ever Happened to...?

"One of the [HDTV] committee chairs told me, 'You guys are just a bunch of ants, trying to dance in a herd of elephants.' "—Richard Gerdes, proponent of the Genesys system.

So, if HDTV becomes a game for cable and telcos, what will become of the folks left by the side of the road?

I've recently seen two proponents of European 1250/50 systems snooping around Hollywood trying to shoot movies, or at least episodic television in HDTV. The theory is that shooting HDTV instead of film is faster and more efficient. This is because the systems can use electronic editing instead of having to use developing tanks and chemicals. Additionally, the filmmakers can have instant dailies. They just have to rewind the tape.

The Japanese have taken an interest in the software side of HDTV. By purchasing major studios, they have captured the film libraries. They no longer have to care if their system wins U.S. acceptance. They will make money selling movies. They will likely be pushing for HDTV in some form. Their movies are all wide-screen, and it will be easier to force their software on us if we have the correct aspect ratio.

But what about the little people? What of the 18 or so small system developers who were squeezed out of the big picture by the Old Boys? Will they be denied their technology forever? In some cases, apparently so. John Music's UVC corporation is no longer listed in the Irvine, Calif., directory. Richard Iredale reportedly moved to Oregon, although I couldn't find him there. After an apparent falling out with NYIT, William Glenn moved to a school in Florida, walking away from his patents.

Some developers fell back to regroup. Yves Faroudja left the HDTV arena and went back to perfecting NTSC. (His new encoder chips are used in the Y/C Plus.) Kathryn and Richard Gerdes abandoned HDTV, and have turned instead to making products for spectrum conservation and compression.

Is There Really a Need?

If everybody's TV at home produced the same quality image as seen on a monitor in a TV studio, there would be little need for HDTV. The image would be good enough. A fraction of the funds being spent for HDTV could perfect the transmission systems used today and do away with ghosts, fuzzy pictures and incorrect colors.

It is hard to tell how much of the eventual HDTV service will resemble what the Old Boys originally schemed. But this much is certain: The path to a wide-screen, high-resolution TV service is strewn with the remains of technologies that should have been given a fair chance to perform. But they weren't because the stakes were too high and the overriding factor in choosing a system was who'd share in the HDTV pot of gold, not what would be the best system.

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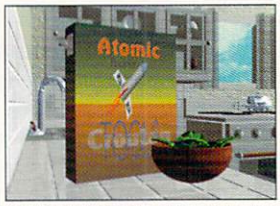

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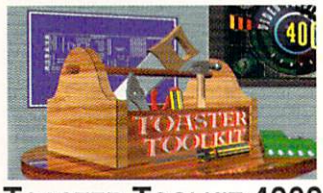

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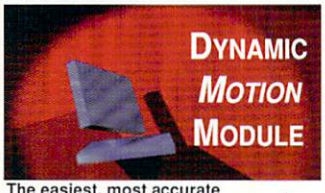

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Dynamic Motion Module lets both animation novices and experienced animators rely upon the laws of physics and computing power of the Amiga to automatically define and create real-world motion and object interaction in LightWave animations. Tell the program how much an object weighs, how fast it's moving, and its direction of travel. Then sit back and let your Amiga define the motion and interaction of the objects in the scene. Many other features which make it perfect for all animation tasks! T5054

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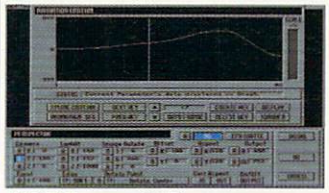

ADPTools 2 Professional

A powerful, spline-based animation system providing image processing, compositing, and special effects for digital video and animations.
Built by professional animators for developing broadcast television effects and multimedia productions, ADPTools Professional harnesses the raw power of ASDG's image processing engine to provide a creative tool for all animators and video producers.
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$139.95

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Save hundreds of dollars! The popular single frame animation control software is now better than ever! If you have a Sanyo GVR-S950 or Sony EVO 9650, you don't even need a single frame controller card! Perfect for Toaster, IV-24, OpalVision and others!

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This collection received great reviews from the European magazines and we are proud to bring it to you! Over 1500 images in this collection! You'll love the Jurassic collection of dinosaurs included in this collection!

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Renowned artist Leo Martin's popular Pro Texztures series have been combined into one jumbo package! Perfect for LightWave, Real 3D, Imagine, Opal Paint, Brilliance and others! Find out why these completely seamless real world images have been used by every major Amiga animator for the past 3 years! They loved this collection in Europe, we're proud to bring it to you!

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Retina 24-Bit Display Board w/4MB Get photorealistic display capabilities with this 24-bit graphics card and plenty of "chip ram" for your most intense graphic needs. Go way beyond AGA and still maintain full compatability. T5129 **$549.95**

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Use your SCSI DAT, 8MM or QIC tape drives as normal AmigaDOS volumes! Fast volume storage! Great for storing huge anims or framestores!

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Get the most out of your system investment because an integrated system is greater than the sum of its parts! TRexx Professional from ASDG is a highly integrated ARexx script generation environment with powerful tools specifically designed for the Video Toaster.
T1180
Only **$139.95**

Interchange Plus 3.0

Multi 3D format interchange software. Now includes three high-end Converters for Wavefront, AutoCAD DXF and 3D Studio formats - previously sold separately for almost $600!
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The "Screen Generator" program included with all Pro Fills Volumes can generate super bitmaps up to 10,240 x 10,240 pixels with seamless, matched edges using the colored patterns and color palettes included with each volume.

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New! 75 wipes and effects for your Toaster!!! 34 Live Action Wipes and 41 assorted 3D Style Wipes, Matte Wipes, Soft Edge Wipes, 16 level Alpha Effects and their own 24bit Effects on any Toaster System.

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Enlan DFS T4010 **$259.95**
Peer-to-peer Netwroking for the Amiga and Video Toaster Systems - at less than $70 per node! Interworks' Ethernet-based Distributed File System gives your customers powerful disk, file and peripheral sharing that, until now, has not been available for the Amiga. No dedicated server is required: Any system can publish its resources and they immediately become available to the rest of the group. Share disk volumes, directories and files. Share printers. Assign passwords and/or allow read-0only access to protect your files.

Toaster-Net

Toaster-net brings the power of the pros to all LightWave users with an impressive list of high-end features that will drastically improve animation productivity! Toaster-Net allows multiple LightWave scenes to Render with the Toaster-Net Scene Que. Render select key-frames (perfect for professional storyboards!), Modify LightWave rendering settings such as resolution, anti-aliasing, save paths, etc. directly from Toaster-Net. Transfer LightWave scenes effortlessly (complete with all objects, images, etc.) from one system to another with Toaster-Net's SCENE MOVER utility (great for archiving your work too!)
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Only ToasterNet can give you the throughput your professional clients demand.

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Art Department Professional

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SunRize INDUSTRIES

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Stripe timecode onto audio or video tape. Let your Amiga be the sync master! Locks to the video sync pulses of each frame of video when used with a genlock or with the Video Toaster. T5067 **$159.95**

HomeBuilders CAD *Deluxe* -- Sale Priced!

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

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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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The PIV•2001 features RS-422 control, configurable TTL or Relay GPIs, +/- 0 frame accuracy with timecode, Industry Standard Editing functions, Save Toaster/GVG-100 Switcher Transitions, CG, Framestores & Keys in EDL and full online help. T5235 **$2449.95**

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Finally you can enjoy the full power of your Amiga 3000/4000 and transform it into the most powerful Desktop Video System in the world!

Use 11 slots at the same time! 10 Drive Bays (5-5 1/4", 4-3 1/2" + your Amiga floppy). Install any Amiga video card on the market! 300 Watt UL listed power supply. Complete with mouse, keyboard and joystick extenders, harddisk & floppy cables, 2 cooling fans, all metal RF enclosure, L.E.D. clock-speed readout.

Imagine the possibilities! Install a Video Toaster, 2 Time base correctors, VectorScope, AmiLink, Anim Recorder, SCSI II Card, Ram Card, Sound Card and *still* have room for **2 more** cards!

Call for pricing on A3000 and A4000 models.

Other Video Toaster Related Hardware

PreVue Technologies

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DejaVue	T5209	$369.95
Toast Timer	T5210	$259.95

Digital Creations

DCTV	T3501	$289.95
Kitchen Sync	T5211	$1249.95
Kitchen Sync S-Video	T5212	$99.95
Supergen 2000S	T5213	$1189.95

Other Hardware

AlfaColor 400 dpi color scan	T5214	$324.95
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GVP Spectrum EGS w/1MB	T5217	$469.95
GVP Spectrum EGS w/2MB	T5218	$549.95
Lan Rover Ethernet Board	T5153	$299.95
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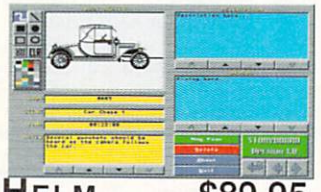
Toaster Oven for A4000	T5219	$Call
Toaster Y/C Plus	T5220	$799.95

Information Manager Professional

Organize your business contacts and more with this information manager! Keeps track of all business contacts with all necessary information and history. Also branches out to Project and/or Agenda databases for individual contacts. Calendar module schedules from day to day, month to month and year to year. It tracks to do's, appointments, birthdays, anniversaries and U.S. & Canadian holidays. Other modules include Reservations (tracks accommodations, transportation and dining), Wallet, Inventory, Computer Equipment Database and World Area Code Database. All areas have online help, search, print, iconize, calculator. T5196 **$69.95**

Home Manager Professional

What Information Manager does for your office, Home Manager Pro will do for the home. Address Book, Appointments, Area Codes, Contacts Database, Inventory, NotePad, To-Dos, Alarm Clock, online help and more! T4035 **$29.95**



Helm $89.95

Powerful multimedia authoring system software. Easily create interactive presentations. Helm combines draw, paint and image processing tools with a scripting language, a hypermedia database manager, and a rich assortment of user interface objects. With its unique action editor, you can quickly build applications that freely mix graphics, animation, text, sound and music. Fantastic value for the price! T5050

Animation and Instructional Videotapes

Animation 101 Best Seller! From Myriad Visual Adventures, a complete course in real-time animation for video. It demonstrates cartoon and industrial animation in high resolution, using basic software and relatively inexpensive hardware. Part one shows you a variety of animation techniques--with humor. Part two shows in detail how the animations were made. V2078 **$24.95**

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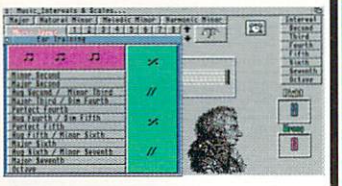
How To Animate ! Sale Price! Relevant to novices and intermediate users alike. Pick up helpful tips and techniques on using DeluxePaintIV from Joel Hagen, and using LightWave 3D from *AmigaWorld*'s Lou Wallace. 45 min. V2059 **$16.95**

The Music Box

Piano Tutor

Rapidly master the basics of playing the piano! Learn to play blues, rhythm, rock, jazz, improvisational -- all of which are the basis for modern music. Piano Tutor is a structured, rhythmic system of learning how to play true keyboard. T5093 **$29.95**

Mozart's Music Master



Easily learn music reading and theory! Includes simple to complex time signatures! T5094 **$39.95**

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Over 100,000 sold!

"OctaMED was already by far the best MIDI and music sample sequencer about - now it's even better." CU Amiga. Completely rewritten to take advantage of AmigaDOS 2+ (required) wit standard windows, pull-down menus and easy, familiar operation. Doubles your Amiga's 4 channel audio capabilities for an ear-popping eight channels of stereo audio! Complete and thorough online, context-sensitive manual...no more searching through manuals!!! •Standard Music Notation Display • 64 MIDI tracks • Pitch Changer • Generic Slide Function •Built-in sampling software •AutoSave •Full Printing T5051 **$69.95**

OctaMED Professional 4 If you are more budget conscious or only have Kickstart 1.3, this is the version for you. Has all of the basic features which made OctaMED a worldwide best-seller! T4001 **$39.95**

Amiga Music File Converter Pro
Converts between SMUS, MED, OctaMED, Music-X and Sound-Tracker Formats. Also Music-X to MIDI. T5101 **$29.95**

AMFCP + OctaMED 5 T5102 **$79.95**

MusicLab IFS T5106 **$39.95**

Both novel and fun--simple or complex--this program allows you to take advantage of the organizational properties of fractals to produce musical sequences with substantial musical unity and cohesiveness. Sequences can be saved as MIDI or IFF SMUS. Original List Price $89.

Video Music Box T5107 **$44.95**
Compose musical backgrounds for video and multimedia--quickly and easily. An almost infinite variety of musical sequences can be created having rock, jazz, blues or latin "feels" - with the large supplied library of chord progressions and pattern templates. Saves in IFF and SMUS file formats.

PC-TASK Ver 2.0

The inexpensive and powerful IBM VGA Emulator solution for any Amiga!

This amazing program lets you actually RUN MS-DOS software on your Amiga! PC-Task runs as a task on it's own screen--leaving your other Amiga applications free to continue to multitask.

It is a software-based emulator and, as such, is not as quick as a hardware bridgeboard, but it is also hundreds of dollars less!

$39.95

Perfect for your occasional MS-DOS needs. The faster your Amiga, the faster the emulator will run. T5072

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History of the Amiga V2042 **$11.95**
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Chronos (Miramar) V2045 **$17.95**

AMIGA BOOKS

Mastering Toaster Technology

The step-by-step guide from Video Toaster experts Brent Malnack and Phil Kurz that no Video Toaster customer can do without! Learn Toaster set-up and operation, rotoscoping techniques, how to make perfect 3D logos, creating mattes and flying mattes, how to master the alpha channel, and much, much more. Plus 2 disk set filled with 3D objects, a beveled & color font set, anim wipes and clip art. Includes Toaster 4000 suplement.
B106 **$39.95**

ARexx Cookbook Deluxe Ed. B104 **$44.95***
Step approach, useful programs as examples, clear presentation of ARexx controlling PostScript, thorough references for all ARexx instructions, functions, and application program commands. Includes 2 great disks!

Amiga BASIC Inside & Out B102 **$19.95***
Amiga Desktop Video, 2nd Ed. B123 **$22.95**
AmigaDOS Reference Guide B110 **$21.95**
Amiga Graphics Inside & Out B119 **$17.95**
Amiga Intern B103 **$28.95**
The definitive reference library for all Amiga 500-3000 users. Hardware, Operating Systems and ARexx Programming.

Best Amiga Tips and Secrets B114 **$18.95**
Mastering AmigaDOS 3 B157 **$39.95**
A must have for the AmigaDOS programmer! Complete coverage of over 140 commands, extensively documents AmigaDOS 2, 2.1 and 3, and contains details on Mountlist, Commodities, IFF, Viruses, Error Codes, Multiview, and more!

Mastering Amiga AMOS B158 **$39.95**
Mastering Amiga C B159 **$39.95**
The bible for learning C on your Amiga! Covers all compilers, including Lattice/SAS, Aztec, and the North Compiler.

Mastering Amiga System B160 **$46.95**
Learn how to handle tasks and processes, work with libraries, incorporate graphics and much more. Assumes a base knowledge of C but explains all new System concepts. Comes with disk of essential utilities.

Mastering Amiga ARexx B161 **$39.95**
Today's Video B1410 **$44.95**
By noted videographer, Peter Utz. Anything a video professional needs to know! 600+ hardbound pages, 1100 illus.!

AMIGA CD-ROM

AsimCDFS V2 *Just Released!* Allows your CDROM drive to access any ISO-9660, High Sierra or Mac HFS formatted disc. Comes with Fish Market Disc Collection (up to Fred Fish #900), Kodak Photo CD viewer, upgraded file system, new preferences editor, audio playback system, advanced playback features! T5092 **$59.95**

AmiNet	T5077	**$27.95**
Audio Resource	T5078	**$29.95**
Color Magic	T5116	**$39.95**
Fantazia Fonts	T5083	**$49.95**
Goliath Clip Art	T5087	**$27.95**
Graphic Resource	T5118	**$29.95**
Mega Media	T5119	**$34.95**
Multimedia	T5089	**$49.95**
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Texture City Over 100 Txtrs	T5016	**$119.95**
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The Amiga Video New ! V4039 **$14.95**
You will learn tips on morphing with Morph Plus and ImageMaster, image processing with Art Dept. Pro, desktop publishing with PageStream, word processing with Final Copy II, animating with Real 3D, tips on DeluxePaint IV, and much, much more. 55 mins.

The Amiga Video Vol 2 New ! V4058 **$19.95**
Our second "appetizer" will give you tips on graphics and video effects using ImageFX and DPaint IV. Multimedia script construction with Hyperbook, font manipulation with TypeSmith, a guide to AMOS and more video tips. 55 min.

DESKTOP VIDEO

Secrets of the AG1960/1970 Companion New Release! Kingsway Productions reveals the super secrets and hidden features of the AG1960 and the new AG1970 S-VHS editing decks. Demos of audio modifications and editing systems. 130 mins. V4037 **$36.95**

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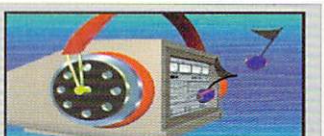

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Business Opportunities

by Allen Edmonds

Video entrepreneurs with a specialized interest and a burning desire to teach others finally have the opportunity to fulfill Thomas Edison's vision and make a comfortable living at the same time.

It was Edison who predicted that his newly invented motion picture medium for entertainment purposes would soon fade to black. The public would lose interest in such a wasteful use of its time, he said. Education and training, more practical and profitable pursuits, in his view, would take over the industry in a short time, and America's dalliance with the movie, as we call it, would be remembered as a passing fad.

The success of your neighborhood mega-cineplex might seem to belie that notion, but as academia discovers the value and cost-effectiveness of advanced communications technology, and as corporate America continues to tap into the vast market of VCR-equipped homes to communicate its instructional wisdom, Edison's vision appears to be on the horizon.

"I predict that within five to 10 years, the theatrical marketplace will be dwarfed by this incredible, growing non-theatrical field that will be doing hundreds of billions of dollars worth of business," said Richard Arsenault, a California-based entrepreneur who came out of film school with a dream to make it big on the technical side of Hollywood.

Instead, he's found his niche in education, marketing videotapes to schools nationwide covering such subjects as multicultural history, the basics of geography and career training. Down the road he hopes to focus on areas such as African history and men's and women's issues through productions from his firm, Pacific Pictures International of Castaic, Calif.

"Video is hot in everything," said Steve Young of Pensacola, Fla., who began teaching his locksmithing trade to the masses via videotape six years ago.

"It's a relatively new technology that has a wide appeal," Young said. "It's finally reaching the point now where everyone has a VCR, and if you provide a video with your product, you have a leg up on anyone who doesn't." The track record of his Tech-Train Productions supports that assertion.

And their enthusiasm appears to be backed by hard numbers. According to the October 1993 Industry Report compiled by *Training Magazine*, 1994 will see a 7 percent increase in spending on formal employer-sponsored training by organizations with 100 or more employees, the largest gain in four years. Moreover, 38 percent of all respondents surveyed by the magazine plan an increase in their training budget in the coming year.

"Whether it's because of all the talk about job training in the '92 presidential election or because reality is catching up with the rhetoric about how 'employees are our most important asset,' employer-sponsored training is on the upswing," the magazine reported.

With the economy yet to regain its pre-recession momentum, some may question forecasts of a significant gain in the national employee training investment. But the tone may, in fact, have been set by the '92 presidential campaign.

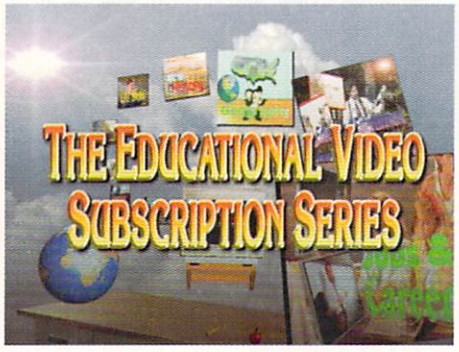
"More than one training manager to whom we spoke attributed this year's increases to the attention training has received from public officials, especially President Clinton," the article stated.

"Susan Northcutt, vice president and regional training manager for Chase Home Mortgage in Tampa, Fla., put it this way: 'Training goes in cycles, and I think there's a cycle right now where there's a lot more emphasis being placed by companies

training the work force. I don't know if it parallels the politics of the country, but it's certainly coincidental, isn't it?' "

But it takes more than the obligatory equipment and video skill to make it, even in the limitless market now available in education and training. Old-fashioned business savvy—the same that was employed in the general store of yesteryear—is a required asset. But it can be acquired as well. The rules are fairly simple. You'll find them in any basic business text: Identify your market, finance your venture sufficiently, figure out how to promote your product and set up efficient production techniques and distribution channels.

In an America that's become less and less enamored with reading and relies more and more on visual information, a golden opportunity has developed in video for those who have a skill or an idea the public needs access to. Technologies such as the Video Toaster have made quality production a possibility even for those without a million or two in seed money. And for many, including Arsenault and Young, teaching has at long last become a lucrative pursuit.



Richard Arsenault's Pacific Pictures has successfully targeted the educational video market to the tune of $1.3 million in 1993 sales. The Educational Video Subscription Series, produced with the Video Toaster, offers more than 400 titles.

Identify Your Market

For Young, a civil-service locksmith at the Naval Air Station in Pensacola who was maxed out at his job position and had nothing to look forward to but cost-of-living raises, 1987 was a year of soul searching.

"I knew I wanted to work for myself, but I had to decide what kind of product I was going to offer. So I mentally drew up a chart of what I was good at and what I wasn't," he said. "I came up with the fact that throughout my career, I had always been good at teaching the people around me. Wherever I had worked, I was always the guy who was talked into teaching the new guy how to do the job. I seemed to have the ability to organize things and put even the most technical matters into a format that people could understand."

The concept of video was "strictly gut instinct from what I knew of the industry," Young said. "I was pretty well-acquainted with the locksmiths in the area, and I knew what my friends were up against. Education really was one of the things that was sorely lacking."

From his own experience, Young knew there was a market consisting of locksmiths just starting out, combined with those who were having difficulty with some aspect of the business. In either case, Young knew he had something to teach.

"If I could just advertise that, I knew I could attract people," he said. "Because there was just nothing out there that could provide the education that was needed."

For Arsenault, it wasn't so simple.

Vital Statistics:

Name: Richard Arsenault
Age: 29
Previous Job: Film Student; Freelance Commercials
Company: Pacific Pictures International
Established: 1987; part-time, home-based
Start-up Capital: approximately $20,000
Specialty: Educational Video
First Product Launch: 1988
First Year of Profit: 1991
Number of Current Titles: 400+
1993 Sales Derived from Toaster Productions: Approximately $1.3 million

Name: Steve Young
Age: 42
Previous Job: Civil-Service Locksmith
Company: Tech-Train Productions
Established: October 1987; part-time, home-based
Start-up Capital: $12,000
Specialty: Instructional Video
First Product Launch: 1988
First Year of Profit: 1989
Number of Current Titles: 28
1993 Sales Derived from Toaster Productions: Approximately $500,000

"It took me seven years to identify my market," said Arsenault. "But it turned out that was a closed market. And it's not really even a market—it's almost like a fraternity."

He finally honed in on education for one major reason: "I came to the conclusion that people don't read anymore. You may say that's a sad statement for our society, but I really think it may represent an evolution of the whole process of learning.

"In a very real sense, gaining information on the video level combines the sensory perceptions. A good filmmaker can give you 1,000 words in just one visual shot. Adding sound, you have the formula for conveying a lot of information very quickly," Arsenault said.

Virtually any skill, specialization or educational message—including yours—can be applied effectively to video. Assuming you have the affinity to teach, and you garner a certain joy from seeing others learn, you already have the capacity to enter this growing marketplace.

Promoting Your Product

But how do you turn this marketplace on to your product? Both Arsenault and Young saw a need to reach potential buyers in large numbers to slowly create the type of sales momentum that would allow their businesses to grow.

For Arsenault, direct mail aimed at schools nationwide proved to be the most effective route. "I put together four-color catalogs right on my desktop," he said. Generating mailing lists and labeling outgoing promotional materials are tasks he farms out to firms specializing in those services.

"But I handle all the conceptual work. I think it's ridiculous to hire an advertising agency to do an ad campaign because I can't afford people that are on my level of thinking. I know my market, and I know what I'm doing from a creative standpoint," he said.

For Young, the creative aspect isn't as important as letting as many locksmiths as possible know that help is available in a convenient format. But he still has fun with his ads. "Some of them are pretty crazy," Young said.

His maiden campaign didn't get off to the best start. "I started by writing to each of the three major trade journals in the business and asked for their advertising information. I didn't even know it was called a media kit at the time," he said.

Of the three journals, one never responded to his inquiry, and one sent the media kit cover with only a single sheet of information enclosed. "I guess I must not have made much of an impression," Young said. But the third, *The Locksmith Ledger*, responded favorably to his inquiry, "and it actually [had the largest circulation] out there," Young said.

After talking to the journal's ad director, he signed a contract for a half-page ad, three insertions on consecutive months. Young contacted a local typesetting company to put together his ad, made arrangements for an 800 number, and prepared for the response.

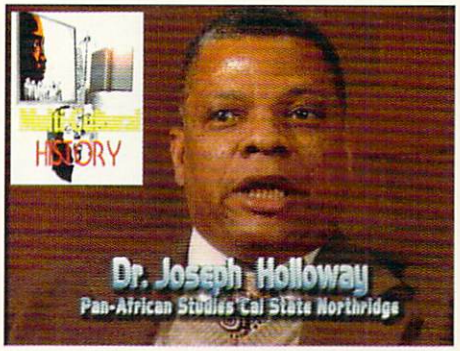
As it turned out, someone else had made it to market with a locksmithing how-to videotape one month before him, and he was crushed. But as often happens, the negative turned to a positive.

Young obtained a copy of the tape, saw how poorly it had been put together compared to his, and took heart. "It was the epitome of amateur," he said. "They did it with a VHS camcorder and no tripod. Unfortunately, a lot of people bought it, and I had to deal with a ton of (public relations) headaches because I had to prove that my product was better."

But it didn't take long. Shortly after shipping a copy of his tape to the editor of the trade journal for review, Young received a phone call.

"He wanted to know if they could promote and distribute the video themselves, and he wanted to know what it would cost to buy them by the hundred," Young said.

In many cases, your product will promote itself when, and if, it falls into the right hands. But the only way to assure that will happen is to blanket the marketplace, undergo trial by fire, and wait patiently for the response. In Young's case, the paid advertisement was a necessary expense, but it was the contact he received from an unexpected source after an unexpected series of events that turned his production line up to full speed.



Top education leaders are interviewed and provide their expert knowledge for posterity in the form of the Educational Video Subscription Series. By subscribing, schools avoid costly speakers' fees and use the tapes repeatedly.

Financing Your Venture

By far the trickiest aspect of any start-up business is its initial method of financing. The risk is usually heavily weighed on the individual, and creativity is at a premium.

Arsenault credits independence and patience for his ability to overcome the hurdles along the way.

"When you're dealing with this marketplace, it really is a Catch-22. I have found it literally impossible to get financing for educational projects, so I'm doing it all in-house," Arsenault said.

The key, he elaborated, is to grow slowly by taking bread-and-butter projects that keep the lights on, and spend the excess from those projects to develop the new technology.

"I've come around to the perspective that I'm just not going to do business for other people's approval," Arsenault said. "I think that for the duration of my career I'm always going to be working on projects that other people aren't quite ready to go out on a limb for. And once they are ready, I will have already made enough money in that market that I won't want to let them in."

Waiting for your venture to produce a profit is an exercise in patience, Arsenault said.

"It's a constant shuffling of energies. You never take your foot off the secure stone until the new stone is completely secure," he said. "Find something the local community needs even if it isn't all that interesting to you. It may

not be what you really want to do, but it will finance your dream projects."

Arsenault suggested wedding videos, documentaries, legal work or logos, all of which lend themselves to the Video Toaster, allied equipment and skills.

Young took the plunge, borrowing $12,000 to start his business. But he also stayed on his job and depended on his wife's income during the early days when the business was struggling to get off the ground.

"I burned up all my annual leave, and then moved on to my sick leave," Young said.

But there were also a number of things he would do differently today, he said.

"I'd learn to budget a lot better. If I could go back and do anything differently, it would be to make savings a priority. Anytime I make money now, a significant portion of it has to go into savings," Young said.

Steve Young's Tech-Train Productions has produced more than 28 instructional videos—the majority of which focus on the locksmithing trade. Enthusiastic clients include auto dealerships, which use his videos to train service department personnel.

But he also did a number of things right. By staying at his job for more than a year after going into business, and by not writing himself his first check from business revenues until nearly a year after it was up and running, Young was able to keep up with the production demands of his newly discovered distribution channel.

Meeting the Demand

The limitations presented by the 24-hour day can seem insurmountable once a demand for your product has been established and you are faced with the responsibility of meeting that demand.

Many see the grunt work involved with running a business as an element that must be delegated, or sanity would be the first casualty.

"That's been one of my major failings all along," Young said. "I get way too wrapped up in busy work, work that should be farmed out."

But for Arsenault, it's important to draw a distinction between the important and the unimportant grunt work.

"There's a real difference between work that's monotonous, but that's important for you to do, and work that really should be passed on to someone else," Arsenault said. "Sometimes you can make one five-minute phone call yourself and say all the right things," where hired help could spend two weeks on the same task and not be able to accomplish a thing.

"There's a real danger of your having to take all your time to redo what your staff might have done wrong," Arsenault said. "As far as the grunt work is concerned, I'll do any and every bit of grunt work, no matter how mundane, as long as it's important that I do it. As with a lot of business, it's based mainly on instinct."

He warned against one of the most commonly made time management mistakes in business today—one that can be particularly costly in Southern California.

"Driving around is the most inefficient way of doing business that there is. I think telephone conferencing is a much more efficient way of getting things done," Arsenault said.

Arsenault rarely drives the 40 miles south into Los Angeles for business, but he knows the UPS and Federal Express drivers by name. He has three phone lines running into the house, as well as one in his separate office.

"I think that having other people do your running for you is an excellent idea," he said. "It's always interesting to me how many people are willing to drive two hours to save five dollars. It's a trap we all fall into to a degree. But every action we take during the day has to be analyzed—do I really need to be doing this? Particularly when you find yourself spending time with something that's not necessarily succeeding."

Another challenge many entrepreneurs face is the constant demand for new products.

Young, whose products include a series of demonstrative videotapes on how to open locked cars, has a constant demand for demonstrations focusing on new makes and models of vehicles. He's found it to be a sales job in itself to produce each successive video.

"I've done a lot of handshaking with car dealers, getting permission to go in and take apart one each of every model they market," Young said. "In order to accomplish that, I agree to provide a promotion for their dealership on the video, and a copy of each finished tape for their service department."

His process involves pulling a new car off the line, taking it around back, removing the door panel, videotaping the entire process and putting the car back together.

At times, those types of approaches can take even more self-confidence than the actual marketing of the final product, as Young found with the Rolls Royce dealership in New Orleans.

"I had decided to get some of the models that we hadn't been able to get before, and I was getting particular requests for tapes on Jaguars and Rolls Royces," Young said.

"When I walked into the dealership, the look on the sales manager's face was just incredible—you'd have thought I had two heads. But I didn't take that as an immediate no. I kept on with what I was doing, explaining the benefits and describing how I was going to help his service department out.

"Finally, he said that he wasn't going to be responsible for the decision, but he took me to the service department and turned me over to them. The service manager fell all over himself to help me out. Not only did he let me take apart a $147,000 Rolls, but we also did a Sterling, and he set me up with a sister dealership in Dallas so I could do both new Lexus models."

Young credits a sometimes overlooked source for his courage, which he said does not come naturally. Motivational tapes, Young said, "really do make a difference."

"Look at anyone that's successful in one way or another, look around long enough, and you're going to find they either read or listen to the motivational experts that are out there today. The self-confidence they can build in you is incredible," Young said.

Your Distribution Channel

Focusing in on a viable method of getting your product to market is as critical a decision as determining which product to market. The best products have been known to languish for years in an entrepreneur's garage, while any consumer knows firsthand the volume of junk that consistently reaches the marketplace. It all depends on the quality of the distribution channel.

At this point, Arsenault has found it to be well worth his time to keep the distribution process anchored at home because of the quality control he is able to exercise. Because he markets through direct mail, the individual orders come back to his home base.

"And at this point, I'm taking every piece of mail and making sure it's perfect, because I need to know how it's done."

That's a big part of the initiation process in entrepreneurship, he believes.

"It's a trial by fire, and if it doesn't hurt to some degree, then you aren't really being tried. When you are a success, you will have that foundation of knowledge behind you, and you'll then be able to handle the big decisions when they come up," Arsenault said.

Young still does a percentage of Tech-Train's distribution out of his home, but the shortcut that he found through the magazine he advertised in continues to pay benefits. Although the editor left the magazine to start his own, Young still benefits from their personal relationship. Today, much of his business comes through ads in the editor's new magazine and from seminars that the magazine sponsors.

"I'm getting a large volume of my revenue in a few big checks, instead of a whole lot of [small orders]," Young said. "In addition, I go to the national and regional seminars in partnership with this organization to promote my videotape. This year, I've flown more than 70,000 miles, and it's paid off for me.

"Had I gone on the way I was without someone taking over the line as a distributor, I think I would have had serious problems. I think I still would have made it, because I have a viable product, but it would have been much more difficult."

Can You Do It?

Neither Young nor Arsenault are business professionals who were groomed for years in anticipation of this opportunity. They are individuals with a skill or specialized knowledge, a love for video production, tools to produce quality, and a drive to work for themselves.

"I want to emphasize that I am not a businessman," Young said. "I never have been, and I don't consider myself one now. I hire an accountant and a business manager to take care of that end of it.

"The fact that I have succeeded to the point that I have," said Young, who has 28 titles on the market covering car entry as well as other specialized topics, "is largely attributable to dumb luck and running into some very good people at the right time. Because I've made every mistake I can think of."

And it's those mistakes, Arsenault believes, that can often lead to a foundation of success.

But you must make sure you're on the right track to begin with. Arsenault believes he is.

"When you're dealing with training and education in our days when there are no real leaders or sources of inspiration, you're giving people guidance in ways that are more important than entertainment," Arsenault said. "Whether you're training someone to make tacos or discussing multicultural history, you're enriching society—and it's critical that you can feel good about that."

It also makes great business sense, he said.

"It's much cheaper for the client to watch a video featuring an important consultant on a certain project than it would be to bring that consultant in for $50 an hour," Arsenault said. "For example, we're going to be using the top consultants in the world on African history in one of our upcoming productions. By capturing them on video and putting them in classrooms in front of the students, we're going to be influencing hundreds of people with the knowledge of the brightest minds that exist on the subject."

That's inspiring, as well as cost-effective, he said. That's coming from an entrepreneur who in the past calendar year has produced more than 400 half-hour programs for outside clients in every area of education and corporate training.

"The communications field is one of the few [nascent industries] America has left," he said. "Right now, the non-theatrical end of it is still small, but the people reading this article have the potential to be the pioneers establishing a whole new industry.

"I think the Video Toaster, for example, is a symbol of things to come along those lines. People always have to have icons to gather around, and this may be it for our industry. What you need to do is get away from worshipping it, focus instead on your skills, and use it to your advantage."

With society moving out of the print stage of communication and plunging headlong into the electronic stage, new markets are being created in every conceivable field.

"There literally is room for everyone," Arsenault said. "The trick is to focus in on your area, and then help your friends, because they're going to help you. Rather than attacking it with the old cowboy mentality, we need to approach this new business with the type of settler mentality that made the Japanese so successful. It's important not to be an isolationist, because we truly are the pioneers."

VTU

Allen Edmonds is a freelance writer and desktop publishing specialist based in Kansas City, Mo.

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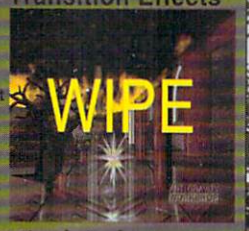

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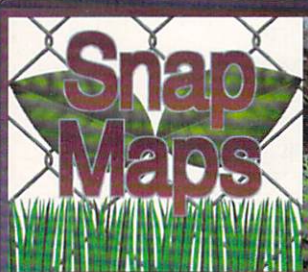

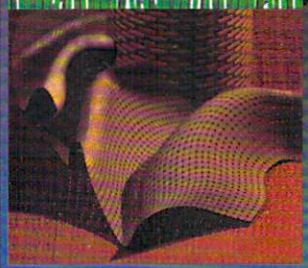

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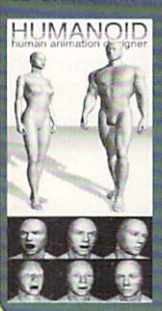

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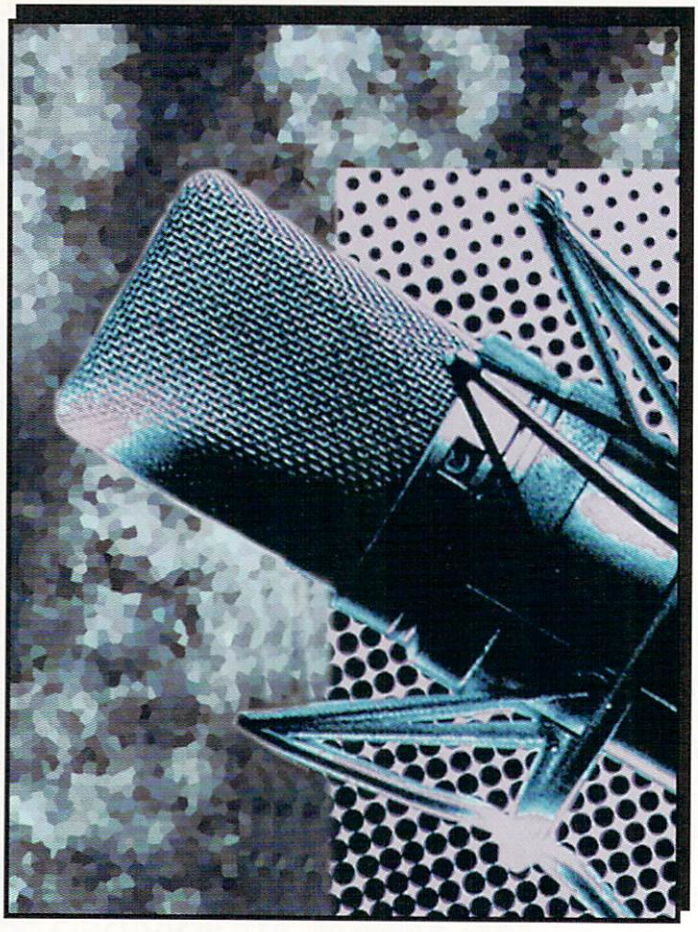


In the previous two installments of this series, we covered the visual processes that are required to capture pictures. This time, we're going to explore the capture and manipulation of sound.

What Is Sound?

In the television medium, sound is equally important as images. Imagine watching a newscast or documentary without audio—sure the pictures tell part of the story, but you need narrative, natural audio to complete the scene. Broken down further, sound is the way that our brain interprets stimulation of our eardrums. Those little, flexible disks at the inside end of our ear canal are connected to a contraption that converts sound into electrical impulses that our brain analyzes as sound. As the disks are flexed in response to rapidly varying sound pressure, the air pressure variations are sensed as they pass by; the quicker a pressure change or a series of pressure changes arrive, the higher the pitch of the sound that is sensed. The differential in pressure between what is sensed immediately before and during the arrival of the pressure variation is interpreted as being volume.

A microphone does exactly the same thing as our ear; it converts variations in air pressure into an electrical audio signal that is representative of the pressure variations. The frequency of voltage changes created by a microphone represents the arrival frequency of the sound pressure variations (pitch), and the amplitude of the voltage changes signifies the differential in air pressure (volume).

Dynamic and Condenser Microphones

Like our eardrums, all microphones have a diaphragm, but that's where the similarity ends. There are many ways of converting the air pressure information into an audio signal, but only two methods that are in widespread use in television: dynamic and condenser.

In a dynamic microphone, also called a *moving coil* microphone, the air pressure-sensing diaphragm is glued to a coil of wire. Figure 1 shows that the coil is moved by the motion of the diaphragm through a magnetic field created by a permanent magnet. Whenever a coil moves through a magnetic field, a voltage is induced into the coil. (This is the same way that the Hoover Dam creates electricity; coils of wire are moved by a mechanical coupling to a turbine in the water flowing through the dam so that they rotate through the magnetic fields of strong magnets.)

A condenser microphone (also known as a *capacitor*) works in a completely different manner; it uses no coil attached to the diaphragm. As shown in Figure 2, the diaphragm is charged with electricity; a second, inflexible

surface placed a short distance behind the diaphragm is charged with the opposite electrical polarity. The charge can be provided by a battery, a phantom power supply, or semipermanently stored in the materials (as done in Electret microphones). The amount of current that passes through the microphone depends on the distance between the moving diaphragm and the stationary plate; when they are closer together, more current can pass through. The variations in electricity are quite small; they are usually amplified within about three feet from the capsule before being sent to other equipment.

The difference in construction between a dynamic and a condenser microphone creates a difference in their ability to convert a wide range of pitches (frequencies). A condenser microphone is usually very small, making it particularly sensitive to high *treble* frequencies, while the dynamic microphone is more sensitive in the lower frequency *bass* region.

Signal-to-Noise Ratio

Even with these differences in frequency response, there is still a contrast in sound as the microphone is moved closer to the sound source; there is a greater presence of bass frequencies. You may have noticed vocalists frequently trying to swallow their microphone; the proximity gives a richer, fuller sound than a microphone that is more distant. The richness of sound is not just a matter of a bass, fundamental frequency, but also a function of the lower frequency harmonics of higher frequency fundamentals.

A close microphone also has the advantage of sensing a greater percentage of desired sound relative to undesired background noise. If the desired sound increases with no increase in noise, the acoustical signal-to-noise ratio has been improved. As we shall see later, the signal-to-noise ratio is also important in the electrical performance of the audio system.

The acoustical signal-to-noise ratio can also be improved by selecting a microphone with an appropriate pattern of sensitivity or pickup. Figure 3 shows the three basic types of microphone patterns that are available: unidirectional (sensitive in only one narrow direction), cardioid (sensitive in a heart-shaped hemispherical directions) and omnidirectional (sensitive all the way around the microphone). For most field applications, a unidirectional microphone usually works best; for interviews, a cardioid is most appropriate; for large groups, an omindirectional functions well.

Another important consideration is the way a microphone is mounted. The four basic types of mounting are handheld, floor stand, fish pole and lavalier. Handheld microphones are good for vocalists and interviewers. Floor-stand microphones, though generally unsightly, are good for groups. Fish-pole microphones are mounted on a 10-foot pole with a 3-foot angled extension to allow manual placement of the microphone immediately outside the visual frame without the operator being near the frame or disturbing lighting and motion. Small, clip-on lavalier microphones are used for moving on-camera talent and in applications where the visual presence of the microphone in the scene is not objectionable. (Most lavalier microphones are small condenser microphones.)

Microphones, like all other components and circuits, offer an impedance to the flow of varying electricity. (Impedance has the same effect on alternating current as resistance does with direct current; there is, however, a phase component associated with impedance.) To minimize distortion, the impedance must be matched from one circuit to another. Almost all professional microphones have a low impedance output circuit (approximately 150 ohms).

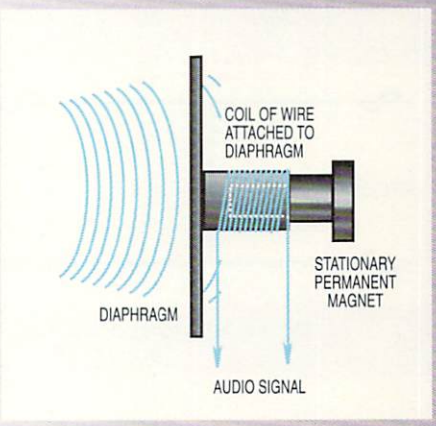


Figure 1: Typical Dynamic Microphone

As the signal progresses through the circuit stages in a system, it will encounter different impedances. Most professional equipment uses circuits designed with an impedance of either 600 ohms or 10,000 ohms (Hi-Z). A low-impedance microphone should be connected to a Lo-Z input that offers a load impedance of 750 ohms or higher.

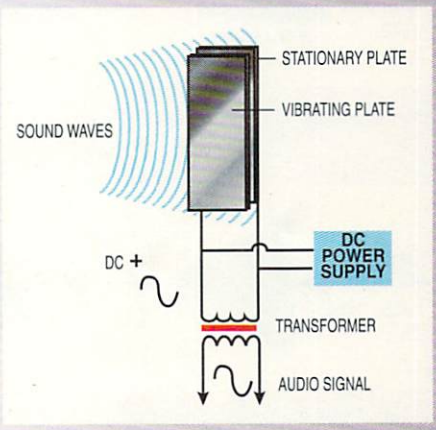


Figure 2: Typical Condenser Microphone

An audio circuit that does not use power (a passive circuit) should exactly match the impedance between the output and the loading circuit. For example, a resistive attenuating pad designed with a 150 ohm output circuit should be connected to a circuit that offers a 150 ohm load.

The output from an audio circuit that is powered (an active circuit) should be connected to a load that offers a higher impedance load. In addition, a line amplifier with a 600-ohm output should be connected to a high impedance (10,000 ohms or greater) load.

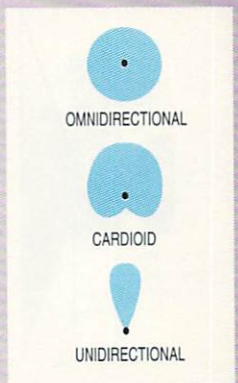


Figure 3: Pickup Patterns

Matching Equipment

Another consideration in matching equipment is the way the signal is transferred from one piece of equip-

ment to another. Some microphones and circuits use a *balanced* transmission method where the signal is split in half and conveyed via two wires (which are usually contained within a grounded shield). Other circuits use an *unbalanced* transmission method where the entire signal is conveyed via one wire that is surrounded by a grounded shield. Balanced signals are less susceptible to electromagnetic and stray signal interference.

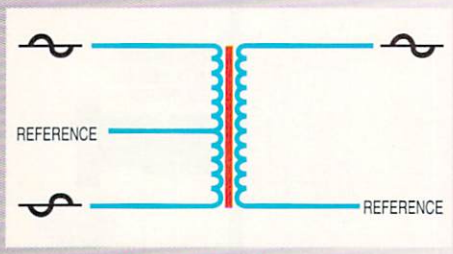


Figure 4: Balun schematic

It is not unusual to discover the need to connect a balanced signal to an unbalanced input or vice versa. The best method to interface between the transmission methods is to use a special *balun* transformer, the schematic of which is drawn in Figure 4. If the signals were directly connected together, there would either be a loss of signal amplitude or an increase in the amount of noise heard in the signal.

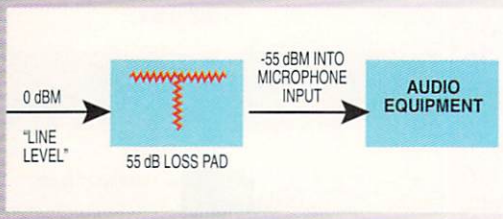


Figure 5: Interfacing a line-level signal with a microphone level input

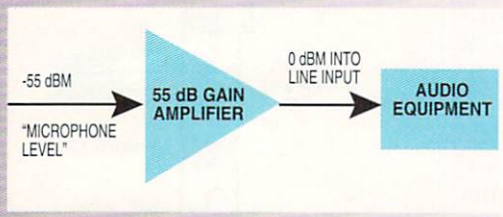


Figure 6: Interfacing a microphone-level signal with a line-level input

Once the acoustical energy has been transduced into electrical energy, it must be amplified, processed, and recorded to make it useful. The electrical output from a microphone has very low power, which is approximately 0.000000003 watts (-55 dBM). The electrical input to a loudspeaker needs to be around 10 watts (40 dBM). Amplification circuits are needed to *gain* power to the needed signal level. Amplification is a noisy process. Not only is the acoustic noise sensed by the microphone present, but electrical noise is added to the signal as it gains strength. In addition to amplifying noise that is present in the signal at its input, each amplification circuit also adds the noise generated within the electrical components within that amplifier *stage*.

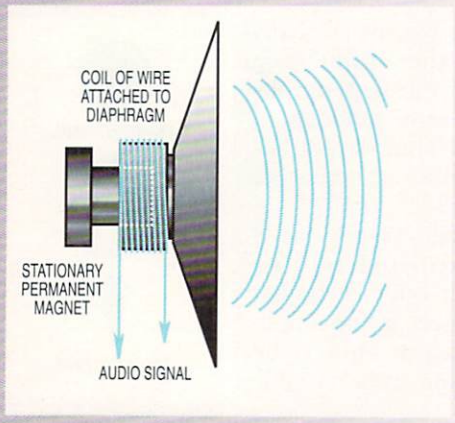


Figure 7: Permanent magnet loudspeaker

The designs of amplifier circuits are optimized for a particular range of signal strength. Some circuits are designed to accept microphone level signals (around -55 dBM); others only receive line-level signals (around 0.001 watt, 0 dBM). If a line-level signal was input to a circuit expecting a microphone-level signal power, the excess power would create distortion to the point that the signal is unusable. As shown in Figure 5, a line-level signal must be *attenuated* to a lower signal power by a pad circuit to be input to a microphone-level input circuit—a process that retains much of the noise introduced by the amplification circuits used to get the signal power to line level.

If a microphone-level signal were input to a circuit expecting a line-level input, the amplifier circuits would need to introduce more signal gain than the design would allow; this would introduce an unacceptable amount of noise. Figure 6 shows how a microphone-level signal must be preamplified to line level before being input to a line-level circuit. You can do this by adding properly designed circuits that move the signal to the proper level.

Another type of amplifier circuit *equalizes* the power of the audio signal at various frequencies. Amplifier circuits are designed for optimum operation at a particular range of frequencies; some work best at high frequencies, others at low frequencies. Since few circuits can handle the entire range of audio frequencies without significant loss at one extreme of frequency or the other, correction is needed to maintain the integrity of audio information. Equalization circuits are found in standalone boxes as well as in amplifier boxes.

Sweetening Methods

In addition to equalization, other *sweetening* methods are often performed on an audio signal. A *notch filter* can be used to remove one offending frequency, allowing others to pass. Notch filters can be used to reduce (not eliminate) the undesirable effect of a drone from a motor, a noisy, fluorescent lamp ballast, or hum induced in the audio from adjacent power lines.

Today, sweetening is often completed on a digitized representation of the original analog signal. A digital signal is an artificial, electrical representation of the original analog signal; a microphone must create a signal that is analogous to the real-world sensation of the human ear. An audio signal in the digital domain is much easier and cheaper to process and sweeten than one in the analog domain. Once processed, the digitized signal must be converted back into analog before being sent to a loudspeaker.

Sweetening in the digital domain may include speeding up the rate at which sounds are heard without changing the pitch (frequency), altering the pitch without changing the rate at which sounds are heard, repeating sounds, introducing silent pauses and modulating one sound with another. During the sweetening

process, the code words in the digitized signal are simply recalculated, repeated or rearranged. In the past, many of these sweetening activities required sophisticated and expensive equipment, but the recent explosion of personal computers with sound cards has expanded the availability of audio sweetening to those on a tight budget.

After amplifying and processing the audio signal, most users want to record the signal onto magnetic tape. During recording, the pattern of magnetic orientation of susceptible particles coated on the tape is rearranged to reflect the voltage variations of the audio signal. More details about the recording process will be covered in next month's installment of this series.

Loudspeakers

The last stop for an audio signal is the loudspeaker. The most popular method of loudspeaker construction uses a permanent magnet to create a non-varying magnetic field, as shown in Figure 7. The varying force created by a coil of wire which the audio signal flows through acts in opposition to the magnetic field from the permanent magnet. The strength of the magnetic field created by the coil of wire varies in frequency and amplitude of the applied audio signal; the coil physically moves in response to the applied signal. To move more air particles and create a powerful air pressure wave, the coil of wire is glued to a large paper or plastic diaphragm shaped like a *cone*. Notice that a permanent magnet loudspeaker appears like a reversed dynamic microphone; in some intercom applications, one assembly serves as both loudspeaker and microphone.

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.*

Shooting for the Edit

How a Little Planning Can Eliminate Editing Traps

by Dick Reizner

Do you remember the last time you tried to assemble a child's Christmas present and discovered that some of the connecting parts or screws were missing? Well, that's how editors can feel when they are working on a video that was shot without planning for the edit.

Whether you are editing in the camera as you shoot, doing desktop video editing or going to the largest, most sophisticated post house, the rules are the same: A successful video should be comprised of different elements pieced together to form a flowing message.

It is your responsibility as the shooter to make sure that not only all the major elements are present on the raw tape, but that they can be made to fit together and that the connectors are there too. Sound diffi-

cult? It is, but if you take a little time to think about editing techniques before you shoot, everything can fall into place.

Within a scene, shooting for the edit usually means providing the editor with a variety of coordinated shots. These might include a wide, establishing shot that shows the viewer where the scene is taking place and the relationship of the elements within the scene to each other.

Next might be a medium shot narrowing the field of view to a single person or group within the larger scene, and the third shot might narrow the view further to a closeup as one person begins to speak or do some task. To concentrate the viewer's attention even more, we might go to a head shot of the speaker or the hands of the person performing the task. Finally, there are reaction shots showing how the people surrounding the main subject are affected by his or her action.

As a former network news cameraman, I frequently planned ahead to avoid running into two of the most common types of editing problems: the jump cut and unmotivated changes in screen direction.

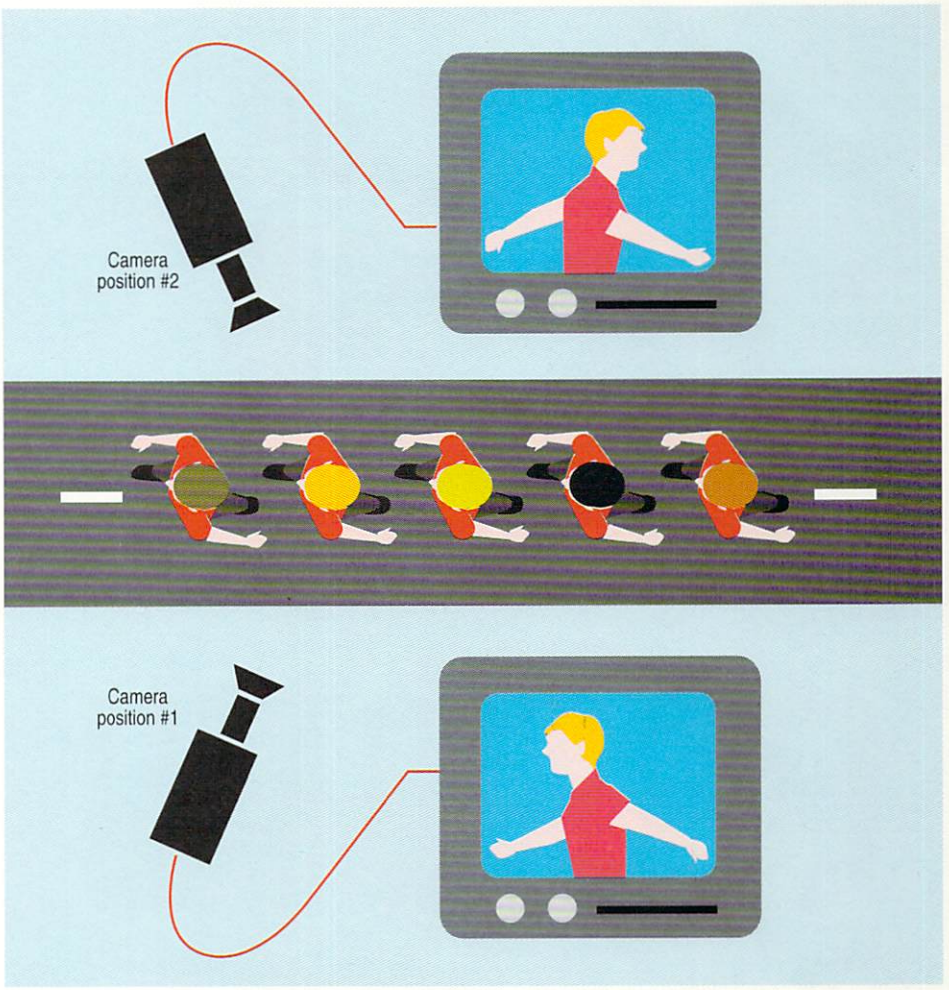


Figure 1

Trap No. 1: Jump Cuts

A jump cut is the type of problem that occurs when we tape a long speech. The editor decides to use two interesting portions, one from the beginning of the speech and the other near the end.

In making the edit, we've purged the boring words, but have also eliminated all accompanying movement. The speaker now appears to jump or jerk from one position to another. It can also happen any time you stop the camera or use an edit to shorten the screen time it takes to complete an action.

There are several ways planning ahead can avoid this type of editing trap. The easiest is to simply use your zoom to change the shot when the speaker pauses or changes subjects. A change of shot is also a good idea any time you stop the recorder. Whether you plan to edit or not, the change of shot will help hide the jump.

A more professional editing trick used to hide a jump cut is called a cutaway. It's a shot of something related to, but usually not including, the main subject.

In the speech example, you might make a reaction shot of someone intently listening to the words of wisdom. Or, a reverse angle of the audience made from behind the speaker in such a way that his mouth cannot be seen. The ever-popular evening news' note-taking shot of pencil and paper also falls into this category.

If the original picture was of someone performing an action, the cutaway might be a closeup of that action or of his or her face watching it. In each of these cases, the goal is to provide material so the editor can perform a video-only insert edit to cover the jump in the original picture.

Reaction shots can also be used to relieve boredom and maintain viewer interest by breaking up the viewer's perception of a long, continuing event. And the more cutaways you have, the easier it will be to solve any problems that pop up during post-production.

"...the more cutaways you have, the easier it will be to solve any problems that pop up during post-production."

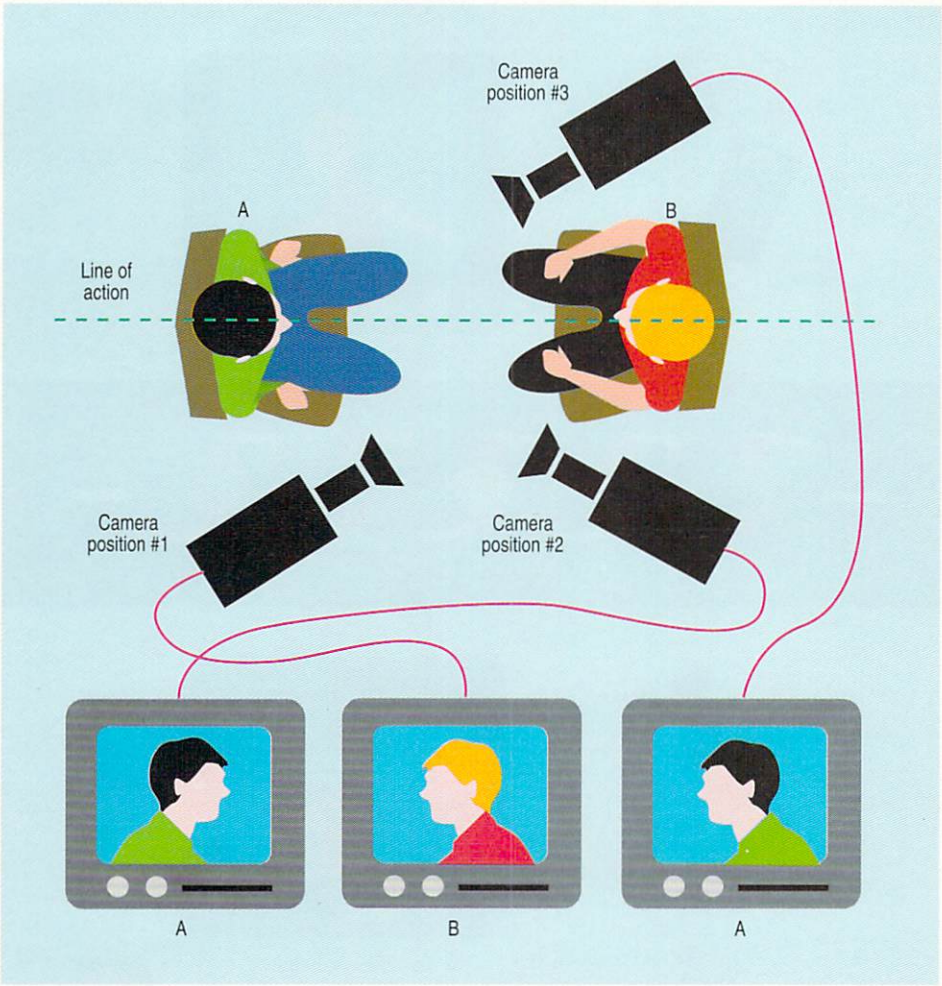


Figure 2

Trap No. 2: Screen Direction

Another common trap that camera operators set for editors is crossing the line of action and creating an unmotivated change in screen direction. Because of an example used in many textbooks, this trap is sometimes called "crossing the street."

The example involves a photographer shooting a parade (see Figure 1). The parade is going from east to west and the photographer is on the south side of the street at camera position 1. The picture made under those circumstances shows the parade moving from the right side of the picture toward the left; in other words, the screen direction is right to left.

If the photographer crosses the street to the north side and continues to make pictures from camera position 2, the screen direction will change. The parade will now appear to be moving from the left side of the picture to the right. That's not much of a problem with still pictures, but if a video editor tries to put the shots together, the parade will appear to go back and forth like a tennis match.

Almost every scene has a line of action; if crossed, it will make the activity appear reversed, which disorients the viewer. When photographing two people talking, the line of action goes through their heads (see Figure 2).

If you combine pictures from two camera positions anywhere on the same side of the line (for example, positions 1 and 2), everything is fine. If you cross that line and try to combine pictures from camera positions on opposite sides (for example, positions 1 and 3), the people will appear to be not looking at each other.

If for some reason you find that you must "cross the street," you can cover your tracks with a shot from directly on the line of action and a cutaway. For instance, use a shot from the middle of the street in which the parade is marching directly at you, followed by one of the crowd cheering. By the time you get back to the side shot of the parade, the viewer will have been distanced from the change in direction and it won't be as objectionable.

"Continuity bloopers happen when people don't pay attention to the details in a video."

Trap No.3: Continuity Bloopers

Continuity bloopers happen when people don't pay attention to the details of the action in a video. It is easiest to make them when you try to edit together portions of several takes of the same scene.

There are many famous continuity bloopers. In the first episode of *Miami Vice*, the detectives use a shotgun to blow open the hall door of the suspects' apartment. The next scene, apparently shot at a different time, is inside the apartment with the door intact. The action then moves back to the hall and the door is once again in shreds. If you look closely at the classic film *The Wizard of Oz* starring Judy Garland, you will see Dorothy's hair change length and style several times.

Timepieces are another source of potential continuity bloopers. In the Clark Gable classic *It Happened One Night*, a clock in the background indicates 2:30 through several hours of action. And historical figures, ranging from a blind man in *The Ten Commandments* to several soldiers in *Spartacus*, have been seen wearing modern wrist watches.

Pay close attention the next time you are watching a television show and there is a candle, cigarette or match in the scene. Often you'll see the burning object get bigger and smaller as the editor cuts from one shot to another.

Many times small continuity errors can go unnoticed by the viewer. However, it's part of everyone's responsibility to keep their eyes open as they shoot and edit.

Transitions

Now that we know about a dozen ways not to go from scene to scene, let's take a look at some good transitions. More than anything else, seamless transitions require planning.

A simple transition that shows continuity is to have someone walk out of the left side of the scene while the camera remains steady. That same person then walks into the second scene from the right side. Thus, throwing the camera out of focus at the end of the first scene and starting the second by coming into focus can be used to knit your program together, while showing the passage of time and giving the viewer a feeling of disorientation.

You also can indicate the passage of time by starting a scene with a shot similar to the one that closed the previous one. And, you might show someone putting out a cigarette at the end of the first scene, then start the next scene with a shot of a full ashtray.

Try mentally dividing the screen into a grid and remember in which section the main subject was located. If you want a smooth, pleasing transition to the next scene, put the new main subject in the same section. This works because the viewers were looking at the main subject in the first scene and their eyes didn't have to search for it in the second. If you want to jar the audience, try putting the subject as far from that section as possible.

Storyboards

To help you visualize the problems and possibilities, try making a storyboard on which stick figures go through all the actions you will be taping. Try showing all the possible angles and framings you can use to provide a variety of shots and transitions.

Then, pick the ones you think will tell the story best. Carry a copy of the board with you during the shoot and mark off each shot as it is completed. This is especially helpful if you are shooting out of sequence. It will prevent you from forgetting something.

Through all of this, remember to keep your eyes and mind open for the unplanned shot or event that can add sparkle to your video. Then make sure you cover it completely.

Jump cuts and unmotivated screen direction changes are things that can make headaches for your editor. Planned transitions and a lot of cutaways can bring a smile. So the next time you give your editor a project to assemble, make his day. Be sure all the pieces are there. VTU

Dick Reizner is an award-winning freelance cameraman. Dick will be presenting his "Mixed Bag of Tricks" seminar at Image World in Chicago on April 26. On April 27, he will present his how-to workshop on video lighting and miking techniques.

ABCs of Video, Part VII

Live Switching with the Toaster

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.]

Well, we made it. Starting with the fundamentals of video, we have persevered through one of the most complex topics in video engineering this side of the transmitter building; that is, match frame editing. It is now time to finish this series by clearing up a few loose ends. One of the most important is using the Toaster as part of a live camera switching system. It is also important to know how to interface a Toaster with an existing switcher. I'd also like to clear up a few errata that may have occurred along the way.

Live Switching Defined

To start, we should define what we mean by live switching. If you are shooting *live* for on-air, cable use, or *live-to-tape* for delayed playback, that's live switching. If you shoot the same scene from several different angles and intend to edit the reels into a finished program, that's *videotaping*. When you shoot your scenes one at a time into one camera, and you intend to splice them all together in an editing system, that's shooting *film style*.

The difference between live switching and shooting for editing is one of immediacy—if you shoot live, what you see is what you have already. The audience knows about your mistakes before you do (if you are doing your job right), because you are mentally three or four shots ahead. *[Editor's Note: For an in-depth look at how to shoot for editing, see Dick Reizner's Master Series on page 86.]*

The technical trick to live switching is to get all the cameras and sources to the Toaster in time, and while you are at it, to make all the cameras look the same color. (See the sidebar: Getting Cameras the Same Color.)

Camera Timing

Adjusting the timing for a live switching setup is easier than for a match frame editing system, but the same rules apply. See Figure 1.

1. Provide an external reference signal to the cameras.
2. Adjust the timing of each camera using its timing controls, or in extreme cases, by adding a delay to the external reference signal.
3. Adjustments must be made using a calibrated piece of test equipment; and the test gear must be externally referenced. Unlike many other switchers, with the Toaster best results are obtained if the sources are timed directly into the test equipment first, then connected to the Toaster's inputs. (This procedure is explained in "ABCs of Video Part V," *VTU*, January 1994.)

For live switching, the general rule is to connect the camera or video source, for which it is hardest to adjust horizontal and subcarrier phase, to Toaster input one. Put the other sources on inputs two through four. It won't be as necessary to worry about some of the timing challenges faced by match frame editing, because you are not trying to sync VTRs for insert editing. This makes color frame not nearly as important, which in turn simplifies system timing.

Use test instruments to align the timing of all input sources. (There are some other helpful devices that display timing information besides a waveform monitor, but they are not substitutes. They only speed up timing. The waveform monitor provides you with a measurement of video levels as well.)

The Easy Way

Now for the really great news. The tolerances required to make a recording are so much looser than those for editing a tape, that, if you are lucky, you may be able to time your system by comparing the cameras' outputs *through* your Toaster, while looking for shifts and jumps on the program monitor.

I say *may* because success will depend on the similarity of the bar generator in each camera. The closer the cameras are related, the better the odds that the bars will be the same size. I am also making the rash assumption that each camera is aligned correctly, and that the bars reflect what is happening with the video signal.

If you are using camcorders, you may increase your odds of a simplified setup if you can play back identical copies of tapes made with a standard bar generator. (This may or may not work, depending on whether the deck's playback video is related to and controlled by the camera's H-phase and subcarrier controls.)

To give this method a whirl, first set all cameras for color bars. Set up a wipe between input one and two, so that the bars are over the top of each other. See Figure 2. Adjust the horizontal timing of the camera on input two so that the position of its bars most closely matches the bars from camera one. Repeat this procedure with the cameras on inputs three and four.

Repeat this procedure for each camera, and use the monitor subcarrier adjustment described in "ABCs of Video Part VI" (*VTU*, February 1994) to check for subcarrier phase.

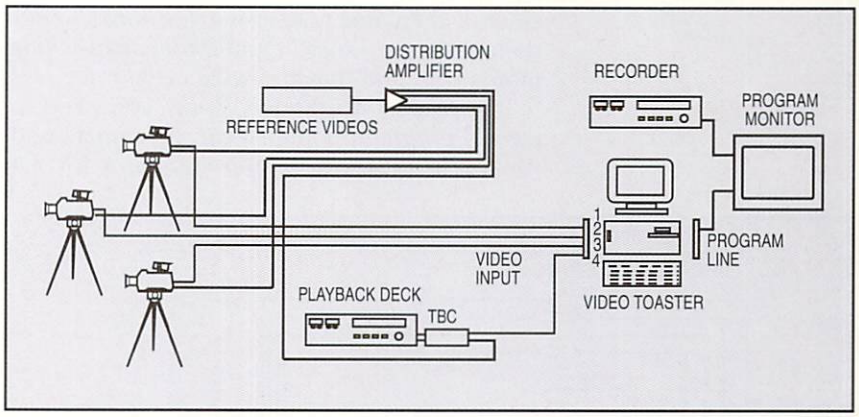


Figure 1. A Toaster system configured for live-to-tape operation. Three live cameras and a tape deck feed the Toaster. A reference video system provides sync to each source.

You may improve your luck by moving the camera's input cables directly to the monitor for testing. (A vectorscope is greatly preferable).

Now is the moment of truth. After you have adjusted H-phase and subcarrier phase on all video sources, make a test recording. Use all the video sources, with both bars and video, as well as takes, dissolves, effects, keys, stills, CG supers (everything you might use in your production). Watch the program monitor carefully to make sure there are no pops and glitches as you make your transitions. Now, look at the tape. If the tape plays back clean, with no glitches during transitions, you'll probably be OK for production. If not—too bad, break out the test equipment.

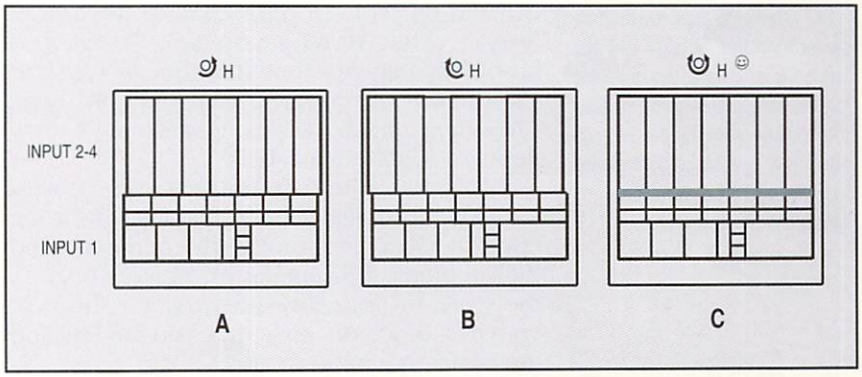


Figure 2. It may be possible, in a live switching environment, to adjust the system's horizontal timing by setting up a wipe with the reference source (input one) bars over or under the source being adjusted. Move the H-phase of the source under test with the H-phase adjustment until the upper and lower bars coincide.

Communications

You should have noticed that if the cameras are distant from the Toaster, this is all a two-person job. In remote vehicle work, the engineers fuss with the cameras with the

intercom headsets that are invariably provided. If you don't have an intercom, then you can use two-way radios, cellular telephones or shout at each other.

As for what to say, I generally tell the tweaker-person to turn the adjustment slowly, one way or the other, until I can see a change at the switcher end. Then I play ridiculous word games. I use directions such as "The other way," "The way you were going the first time," and "Not *that* way!" until the setup is grossly close. I then fine-tune using fractional words such as "just a skosh," "half-a-hair more," "one more tidge" and "breathe on it a little."

If you must do the job alone, you need to have a program monitor near the camera and run back and forth to the Toaster a lot. Of course, now that you have read this series, you understand that the electrical signals are delayed by cable in proportion to the cables' length. That is why you know that you absolutely may not time the cameras on short cables near the Toaster, then unhook them, carry the cameras out to the stage, and hook them up to different cables.

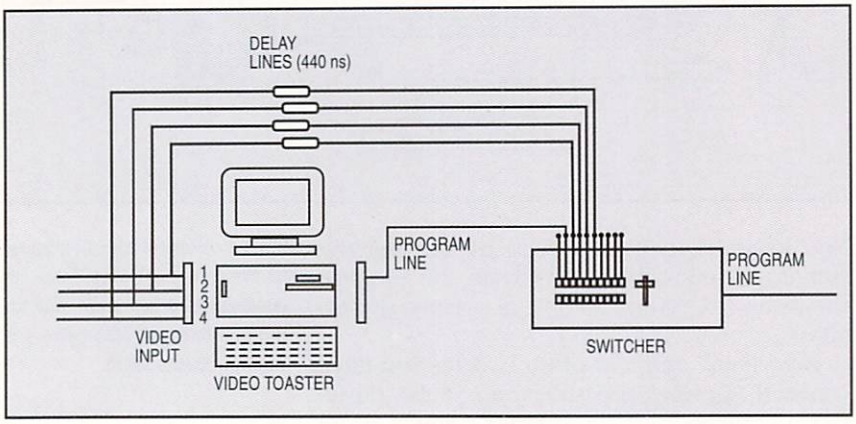


Figure 3. When connecting the Toaster to a conventional switcher, it is best to have the same sources show up on both the switcher and the Toaster. To accomplish this, the input sources must be delayed by the electrical length of the Toaster. In practice, this is most easily accomplished by using one of several products designed for the purpose.

Of course, there is nothing wrong with hauling the actual camera cables up to the control room first, timing the cameras, and then running the cameras and cables back to the stage, or using any other trick or short cut you can think of, now that you understand the basic principles.

There Is a Hybrid in Town

The increasing popularity of camcorders presents an interesting opportunity for videographers. They make it possible to record an event live to tape, but still make backup recordings (called iso-reels) of each camera. This makes it easy to fix things in post-production that may have gone awry in the original shoot. It also provides you with plenty of extra footage for cutaways and other editing tricks.

Toaster on a Rope

One of the frequent questions video engineers hear about Toasters is how to use them

Getting Cameras the Same Color

You have three cameras wired to your switcher, and they all look different. What do you do? Here's a few tricks you might try using.

Step 1: Check to see if there are any filters either on the camera lens, or in some kind of filter wheel behind the lens. These are usually specified in terms of the color temperature of the light under which they are made to work. Make sure the filters are the same for all cameras.

Step 2: If you are brave, adjust camera registration. Tweak in the back focus while you are at it. Don't even think about making these adjustments unless you know what you are doing. It will be far safer to run any auto-setups your cameras may have.

Step 3: Turn on the lights that will be used on the subject you are shooting, and walk out with a big white piece of poster board. Turning the board to face each camera in turn and zoom in so the card fills the screen. Do a black balance. Cap the camera and do a white balance. Uncap the camera and do a black balance again, then cap it once more and do a white balance. (If you do not have the white card, it is possible to use the back of a person wearing a clean, white T-shirt.)

Step 4: Cut back and forth between the cameras and try to dial out any color differences using the camera's paint controls, if there are any. It may be helpful to run up the chroma gain on your monitor when you do this. It may accentuate some color errors or mask others.

Realize that system timing relates directly to apparent camera color. Before the cameras will match, you must verify that system timing is correct.

If color differences persist, it may be time to take one or more of your cameras to an experienced technician. Camera setup can be tedious and difficult. Nevertheless, if they are not set up correctly, you will notice the differences in cameras when you change shots. This is not the mark of a professional. In most remote production situations, if one camera is even slightly different than another, the producer and director will most assuredly make their dissatisfaction known.

in concert with other switchers. This is the only instance I can think of when a Toaster user needs to concern himself with the 440 nanosecond (ns) delay figure often mentioned as part of Toaster lore.

It is most convenient if the inputs feed the Toaster and the second switcher as well. See Figure 3. The Toaster output then feeds the switcher as an extra source. In this way, the Toaster can function as a character generator making titles, or a still store calling up images which feed the downstream switcher, or as a paint system; in short, it offers most of the features that makes a Toaster endearing.

However, the Toaster has an electrical length of 440 ns, and this must be compensated for. The easiest way to do this is with a few delay lines. It is much more effective, however, to use a product such as the Toaster Timing Board, from PreVue Technologies (formerly Cardinal). This allows you to delay all channels precisely the same amount. It also offers a key signal which makes the Toaster CG work better on the second switcher.

Errata

It pains me to admit it, but I'd better do it now to save you some time. There is an error in "ABCs of Video Part VI." The Toaster cannot be subcarrier-timed using a vectorscope on the Toaster output. You need to use the vectorscope on each input cable, as discussed previously in some detail (for waveform monitors) in "ABCs of Video Part V." Also, the color-field shift mentioned in "ABCs of Video Part VI" is two color fields, not color frames. Sorry.

The Exciting Conclusion

If you have stayed with me for the entire series, you have been exposed to many of the important issues of video engineering. These skills, coupled with your Toaster expertise, may be just enough for you to win some attention in your local video circles. At the very least, you will be video sensitive. This will help you overcome some of the bias you might meet at TV and cable outlets that have not yet "got it" as far as the Toaster is concerned.

Good luck. If you have any questions, feel free to contact me at the address mentioned in the Dr. Video column near the front of this magazine.

VTU

Acknowledgments:

The author wishes to thank Gary Krohe, chief engineer, KCMI-TV, Baldwin City, Kan., for significant help in preparation of this series.

ABCs of Video Part VII

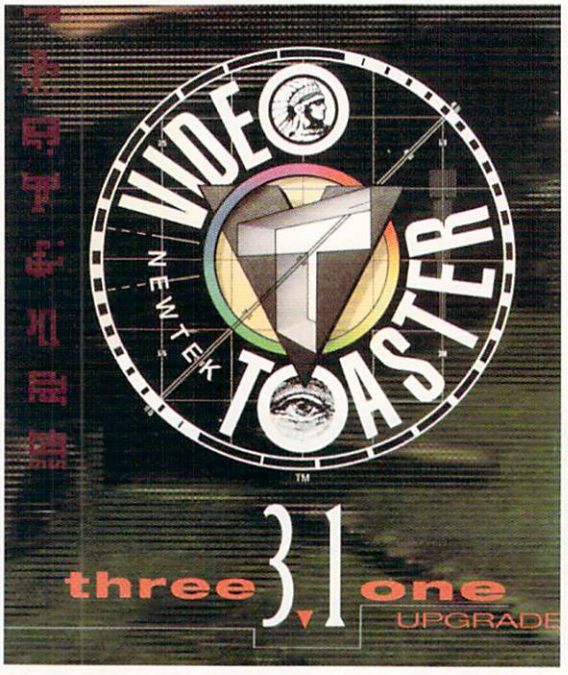
"The difference between live switching and shooting for editing is one of immediacy..."

NewTek Ships 3.1
There's More Than Bug Fixes

by Lee Stranahan

NewTek apparently decided to give Toaster owners an early holiday present last year. On Dec. 17, 1993, they announced a new version of the Video Toaster—System 3.1, which would be sent free to registered Toaster 4000 and System 3.0 owners.

Of course, NewTek has always provided updates that fix bugs in the past, but System 3.1 is more than just bug fixes. This is the first revision upgrade that actually provides new features. System 3.1 ups the ante, so if you've been holding out, you may not have an excuse not to upgrade anymore.



The upgrade consists of six disks, and its installation is easy. Simply put disk one into your Toaster system's floppy drive, double click on the install icon, pick the destination drive and the program does the rest. It eliminates your old projects, although it asks before erasing anything; the entire procedure should take around 10 minutes.

It's important to note that there are two different versions of the update software—one for the newer Toaster 4000 card, and another for the older card (called the Toaster 2000 card on the disk label). Make sure you're installing the right software. I accidentally installed the VT-4000 version on my 2000 with the original card and very bad things happened. Avoid my mistake and everything works fine.

Aside from the new software, the update also includes new written material for the Toaster manual. This text corrects some errors, contains a description of new features, and repairs some major oversights by providing information on the Symbola font in the color fonts directory and macros in LightWave Modeler. It also includes a number of tutorial objects that were missing from the original 3.0 release.

Toaster 3.1 also comes armed with (surprise, LightWave users) a new license agreement. Now, I'm not a lawyer, but there are two parts of the agreement that I found very interesting. First, it's made quite clear that the Toaster hardware and software were designed to work together, and that any separate use violates the license agreement. Second, violation of the license agreement means the user loses the right to use the software as well as any "derivative works." Personally, I like derivative works.

Back from the Grave

When NewTek upgraded System 2.0 to 3.0, a few effects fell by the wayside. Some users weren't too happy about that, and NewTek has responded by bringing back those missing effects. The "new-old" effects include Spheres Join Up (called Hemispheres in System 2.0), Peel Fly Away, and the ever-popular Spin Explode. You can access them by loading the 002-System2.0 or 002-Sys2.0AA projects.

It's good to see these old friends again, but like anyone who has read Stephen King knows, sometimes when dead things come back they're, well, different. For one thing, the icons look different—smaller and less bold. The more important difference, however, is their slower speed. Not only do the effects take noticeably longer to load in 3.1, but they actually run slower. I timed the Spin Explode at the fastest speed, and the new version took about one second longer to run. It doesn't seem as smooth, either. Overall, the return of the effects is a mixed blessing—it's nice that they're back, but you might be less inclined to use them in their new incarnation.

What's New

There are also a number of new effects, all of which are winners as far as I'm concerned. The only trick for many users will be finding the effects; they are part of an extra project. On a VT4000 system, load project 010-System 4000 and look on effects banks B, C and I. On other systems, load project 011-System 3.0 and look on effects banks B and C.

There are a couple of great new digital effects, SnapOffR and Screech. Both of these look great and also work very well in conjunction with the Toaster's keyer. There's also a funny new sports effect called Smash, perfect for your next blooper reel. VT4000 users get a new overlay style effect (similar to the globe rotating in the corner) called Atom, which adds a scientific look to any production.

continued on page 96

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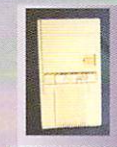

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Toaster 3.1 continued from page 94

My favorite new effect is Viewfinder, which creates an overlay like you'd see in the viewfinder of camcorders, including the flashing REC light. This is a simple idea, and you've seen it a million times on TV, so it's great to be able to set it up as a quick effect. You can also change the color of the viewfinder—just pick the effect, go to the Setup screen and pick the color of your choice.

One other Switcher change will be obvious the first time you try and save a framestore. It now takes approximately 10 seconds—a big change from previous versions. System 3.1 also fixes the framestore-saving bug that occurred with GVP's popular G-Force '040 card.

Although it's not mentioned in the new manual (or any official NewTek documentation), the VT4000's Hardware Setup panel has also been updated slightly. This panel, which can be accessed on VT4000 systems by pressing Right-Alt, Right-Shift and F-0, allows manual adjustment of the Toaster video output settings. This feature is not supported by tech support, so although you'd have to work pretty hard to hurt anything, you might be careful.

In addition, there is now a Delay Range button. This is used in conjunction with the Lock Phase and A/D Phases settings to set Master Genlock and Analog/Digital phasing. If that kind of talk scares you, you should probably avoid this panel.

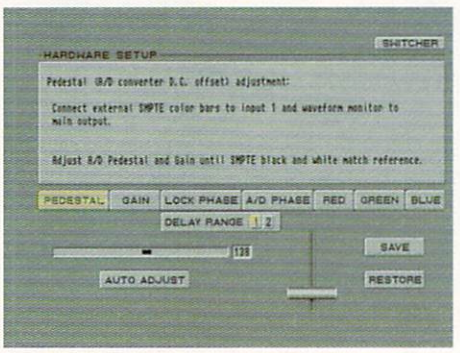
The Toaster's Character Generator has been given a number of bug fixes, as well as an important new feature—color gradients on both text faces and borders. This will add quite a bit of variety to your color or key pages. In the wish-list department, gradients don't work on scroll or crawl pages, and the gradients are top to bottom only—different gradient patterns, like those in Innovision Technology's Montage, would be a nice addition to a future version.

There are a number of font fixes, but only two color fonts. I wasn't that impressed with the color fonts that were included. City is a blue and purple pattern that seems suited for corporate and hi-tech uses, but I found it rather difficult to read. I think SansMarble is the more useful font. It has a pink marble texture with dark shading across it, but the font kerning (the spacing between letters) is a little off.

ToasterPaint

The news on ToasterPaint is that there is no news. Unfortunately, ToasterPaint received about the same amount of attention it got in the original 3.0 upgrade, which is none. (The rumor mill says that NewTek is working on a fairly substantial TPaint upgrade for the next release of the Toaster.)

A handy new 3.1 overlay effect is Viewfinder.



This is the updated Hardware Setup Panel.

LightWave Goodies

LightWave has added a number of improvements, including one new feature that allows null objects to be added by merely clicking a button, conveniently labeled Add Null Object. The only downside to this process is that LightWave scene files are not backwards compatible. In other words, any 3.1 scenes that use null objects will not load properly in pre-3.1 versions.

There's also a feature that cuts off a little of your render times, the Render To DV1 button. In pre-3.1 versions of LightWave, any frames being rendered would always be output to the Toaster's framestore buffer. System 3.1 defaults to this setup, but turning off Render To DV1 means RGB images and animations can be saved without this extra step.

The benefit to using Render To DV1 is the time saved—about five seconds per frame. Five seconds might not seem like that big of a deal, but when creating preview animations, it can be significant. Animators often create previews in low or super-low resolution, with no antialiasing options turned on. This creates lousy-looking frames, with many jagged edges. It's not pretty, I thought, but useful because the frames render extremely quickly and the animators can get a much better idea of the final look and feel of a piece then they could from a wireframe preview.

It's in these preview animations that the Render To DV1 button really makes a difference. Because they are created in such low resolutions, the render times are quick—often 10 or 15 seconds per frame for a flying logo. Dropping five seconds per frame can mean cutting render times in half and getting a four-second preview rendered in about 10 minutes instead of 20.

Another feature that can help create preview animations is the Data Overlay function. This overlays the current frame number plus a user-definable label. This makes it easier to pinpoint where problems are on a preview animation. It also allows you to give an unusable preview to clients for approval. The data overlay function only works on Low or Medium resolution animations on System 3.1.

There are also a few convenient features, such as the option of deleting all child objects when you delete the parent. Here's an example in layman's terms: Let's say you have a scene with an airplane and a propeller. You have these as separate objects so the prop can spin independently of the airplane, but (for important safety reasons) you want the prop to move with the plane. You attach the prop to the plane by using a process called parenting.

To do this, you would make the prop object as your selected item and then click on the Parent button. You would then choose the plane as your Parent Object. Now, whenever you move the parent object (the plane), the child or descendant object (the prop) will follow it. It's important to note, however, that descendants keep their own motion paths, so your prop could be spinning while it moves with the plane.

Being finicky, you then decide to delete the plane and prop. With 3.1, all you have to do is choose the parent object (the plane), and click the Clear Object button in the Objects panel. A requester would ask if you were sure, and then if you wanted to delete any descendant objects. Prior to 3.1, each descendant would have to be selected and cleared separately. A small savings, perhaps, but scientists have shown that time savings like this

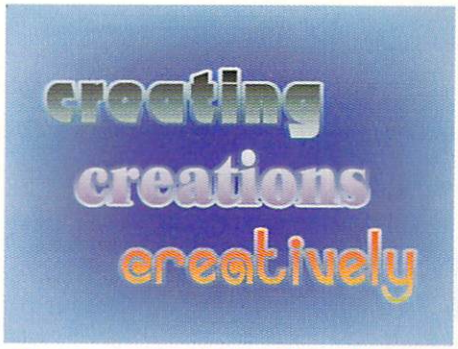
could save 3.2 years of your life in the long run.

One change that is mentioned in the manual I received, but not in the software, is the ability to preview images inside the various surfaces requester. This would be a handy feature, since it would allow you to actully view the image rather than just trying to decipher a name. Since it's not included in the 3.1 version of LightWave, let me make a fearless prediction—you'll see this feature in a future release.

Modeler Support

Modeler doesn't have any new features, but a couple of additions to the written material might make it seem like it does. First, there is a list of Modeler Macros with a brief description of how they work. Macros are small computer programs that automate functions, and they are one of Modeler's most important new features. Until now, learning about them has been something of a Lewis and Clark experience. System 3.1 corrects this oversight.

Second, the manual mentions Modeler's previously secret Save As Layers feature. This is a keyboard-only shortcut that became available with System 3.0, and it allows you to save objects in progress for later work in Modeler.



Color gradients are available for text faces and borders.

Data Overlay places frame numbers and user labels.

First, select the layers you want to save. Now the trick is to press and hold down the Alt key and click on the Save button. Name the file anything you want. This file won't load in LightWave—it only works within Modeler—but when you load it, it will put all the object's elements back into their original layers when you saved.

So there you have it: more goodies to play with, and if you've upgraded to 3.0 or use the VT4000, it's free. If you're a System 3.0 or VT4000 user and haven't received the upgrade, you'll want to run down to your dealer and pick up your copy, especially since you can't beat the price tag. New features and effects aside, this is a more mature, stable version of an already significant upgrade. If you haven't upgraded yet, be sure to run down to your dealer for that, too. VTU

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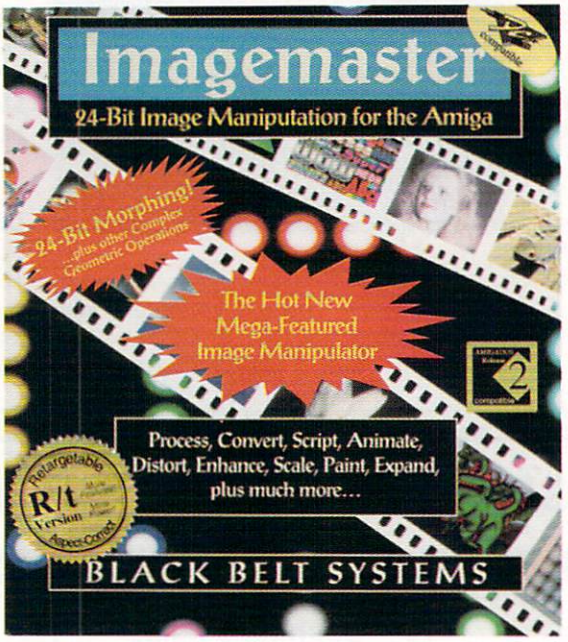
Imagemaster R/t 1.06
A Strong Image Processor Gets Even Better

by Michael and Nicole Bushey

It image processes, it composes, it paints, it color separates, it morphs and it's only $99.95. The product is Black Belt Systems' Imagemaster R/t 1.06, a completely redesigned version of the company's classic Imagemaster. This new version is not only more powerful, but also has an improved user interface.

Imagemaster R/t, which stands for retargetable graphics, installs from six disks to 8.5 MB of hard drive space. Any Amiga with AmigaDOS 2.04 or greater can run the program. At least 6 MB of RAM and an accelerator are recommended. Imagemaster currently uses Amiga (ECS + AGA), HAM-E, OpalVision, and Firecracker 24 as display devices. Graphics can also be exported to the DMI Resolver, GVP IV-24 and Harelquin boards.



After using Imagemaster R/t, you will find that the suggested 6 MB of RAM is not adequate for professional use. All pictures loaded into Imagemaster R/t are converted to 24-bit color. With an undo buffer, each NTSC frame (752x480) takes up about 2.5 MB. This means compositing two NTSC frames, with undo buffers, requires 8 MB of RAM (Imagemaster R/t also takes up 2.5 MB). Add a few 24-bit brushes, and you need even more RAM. However, if you are running Toaster 3.0, you should be set.

The program uses many icon menus instead of traditional pull-down menus. This means that while it may not be as familiar to operate—in fact, it can look downright intimidating—it actually makes the functions faster to access.

Another intimidating factor is the lack of a printed manual. Users get a few sheets of paper explaining how to install the program, but the documentation is built into the program. When you run the program for the first time, it would be a good idea to hit the Help key and begin reading the general overview, or you can print the manual if you wish. If you decide not to print the manual, don't worry; it is actually easier to use the built-in ApAssist manual. Just hit the Help key with the mouse pointer placed over what you are confused about. This will bring up the ApAssist manual opened to the correct section. ApAssist is interactive and displays helpful illustrations. Included is a table of contents, index, introduction, reference sections and tutorials on how to use morphing and ARexx.

Imagemaster R/t contains more than 30 loaders and 20 savers. A few of these formats are: IFF, Framestore, GIF, JPEG, TIFF, TARGA, DCTV and TRIM. TRIM is a proprietary compression format that reduces IFF-24 files without introducing image loss. Thus, TRIM allows the hard drive to hold twice as many pictures. Imagemaster R/t also loads and saves framestores, so you can work easily with the Toaster.

Imagemaster R/t automatically detects the image format being loaded and also catalogs your images into color thumbnail icons. This makes finding and loading pictures fast and efficient. Furthermore, there is built-in scanner support for Epson models ES 300c, 600c and 800c.

A working environment that comes in handy is the filmstrip mode. With this turned on, all changes to your image are logged in. This works great for morphs and multiframe sequences because you can play back a preview from the filmstrip at up to 60 frames per second.

What It Does

Imagemaster R/t can perform literally hundreds of different image processing techniques for print and video, which can be overwhelming. However, after using the program for a couple of hours, you will be amazed at how much more you can do with this software than with other image processing packages.

Imagemaster R/t can be used for making customized effects that animate across the picture, for wipes, painting from slates to image wraps, warp morphing and morphing between two pictures. It is fun and easy to create customized and unique backdrops for character generation.

In video work, you will find new applications for Imagemaster R/t on a daily basis. For photographic and print applications, you can adjust CYMK values and do color separations. If you design 3D flying logos, product designs or renderings, you may need this for printing your product on other

continued on page 100

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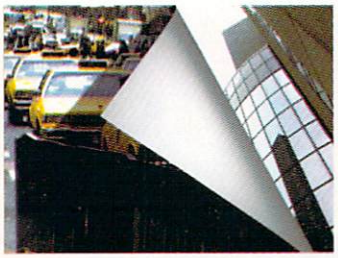

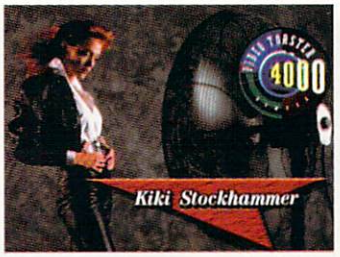

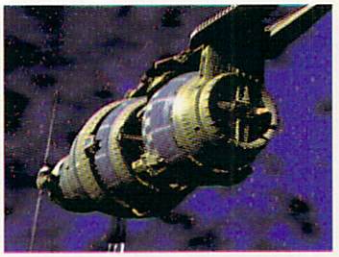

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Imagemaster continued from page 98

media, such as paper, plastic or T-shirts.

Black Belt Systems has numerous ways to help you figure out Imagemaster R/t. The technical support staff is friendly, knowledgeable and answers questions accurately. The company also has a BBS for additional support. By the time you read this, there should be a three-part series of tutorial videotapes available that will further demonstrate the uses for this program.

Upgrades to Imagemaster R/t are released every few weeks. You receive one free upgrade to the software, and subsequent upgrades will each cost $25.

Figure 1

Figure 2

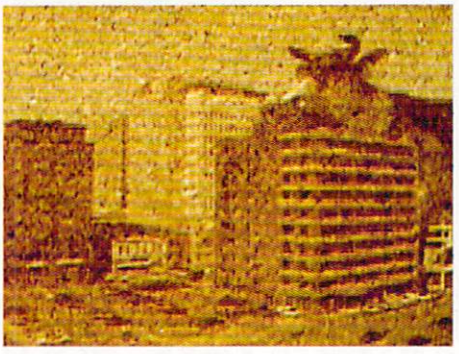

Figure 3

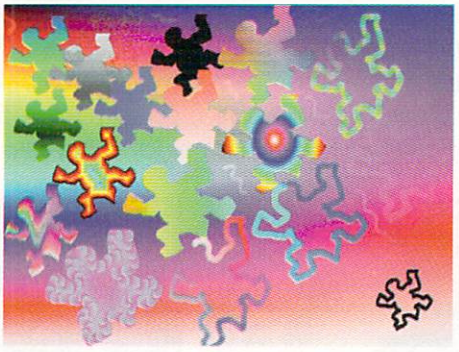

Figure 4

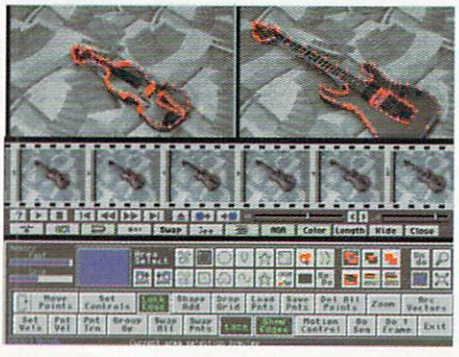

Figure 5

Image Processing

The image processing section includes several sub-menus that provide an extremely wide range of options for changing the picture. The Standard Adjustment menu offers features such as brightness control, contrast, gamma and colorize. The Geometric menu has tools that will bend and twist the selected portions of the picture. Some of the tools in this menu allow rotating pictures to any angle, and effects such as mirror, dome, caricature and zigzag.

In the Filter menu, users access controls to remove pixels, reduce glare, antialias images and filter and limit NTSC video. The Special F/X menu offers the most interesting tools of all. In it, Motion Blur will make the selected area streaked and blurred. The Random Tile tool scatters the picture into cubic fragments, which makes it easy to create background images. The Melt tool creates vertical fringing where there is a change in contrast. Asterize will make a user-definable sparkle (see Figure 1).

By adjusting various parameters, each effect can be modified. The Annular tool, for instance, creates many kinds of halos. There are tools to make pictures look like watercolor or oil paintings, and even more menus stuffed full of tools to process pictures. Figure 2 is a background created with several of these image processing tools.

Image Compositing

Onionskin is a global setting that applies a transparency to the primary image to reveal the secondary buffer behind it. This viewing technique comes in handy when doing compositing, because it allows you to see what you are rubbing through. There are dozens of different compositing tools that enable you to join two separate images. Figure 3 was created using the Primary Surface Shading and Emboss tools. The Emboss and Punch tools can be used for making classy and conservative backdrops.

Being able to use an unlimited number of buffers makes working with complex collages, in which bits and pieces come from many different images, easy on the artist.

Complete 24-bit Painting Tools

The main difference between Imagemaster R/t and other paint programs is that there are no real-time airbrush tools. Everything in Imagemaster R/t is rendered. Nor are there preset sizes of round and square brushes; all brushes are user-created. You can swap between numerous brushes in an instant from a list that you have already created. There is no limit to the number of brushes available other than RAM.

This program has an amazing amount of range-fill options. Imagine a range between 256 user-specified colors. Now recall ToasterPaint, where the only range is between two colors. To make the range capabilities even better, the user can link two customized ranges to work together in many different fill types. One of these will range the colors following an outline. The results from this is an area that looks like an agate with rings of colors. Figure 4 is an example of some of the range types. The possibilities with these range tools make drawing on the program quite enjoyable.

Auto smoothing and blending makes your work go faster. Instead of repeating steps to do smoothing and blending, you can have your computer perform these functions while you draw.

Morphing

It was a surprise to find that the quality of the morphs was as good if not better than other morphing packages. Imagemaster R/t will allow you to do both warp and compose morphs. Setting up the points and edges is easy, and the morphing is fast. Figure 5 shows the user interface. Each filmstrip clip took only 5 seconds to render on an A4000/'040. Full 24-bit NTSC frames, such as Figure 6, took 2.5 minutes per frame.

ARexx Programmable

Imagemaster R/t is ARexx programmable, which means you can have the program do the work for you. Imagemaster R/t's ARexx usage has been simplified to

Figure 6

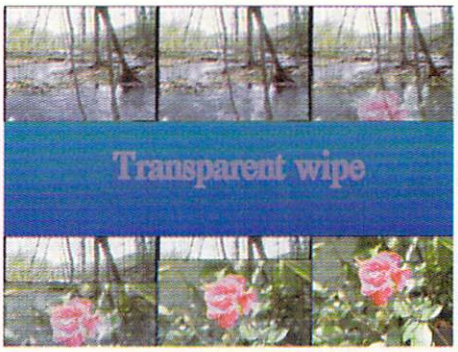

Figure 7

Figure 8

make programming scripts easy for everyone. This feature may not be for a computer novice but should be easy enough to learn for experienced computer users. Figure 1 was created with the following ARexx script:

```
/* Asterize Arexx Script */
options results;
'Tween 0 360';
'ast' 255 255 0 25 50 1 4 result 0 0;
'finish';
```

As you can see, the script is not complicated, and the ApAssist manual covers everything you need to know.

Wipes

In Imagemaster R/t there are 24 wipes included. The benefit to using these is that they are created in full 24-bit color. Figure 7 shows an example of a dissolve while the image is moving into the picture. The disadvantage to these wipes is that they are not real-time effects like Toaster wipes. Each frame of the wipe must be calculated and saved, then dumped with a non-linear system or a frame-accurate deck.

This could actually be a lifesaver for someone with a non-linear system, because some do not support wipes internally. This is also a great way to add wipes to animations. Figure 7 shows six frames from a wipe that was compiled into one picture using Imagemaster R/t.

Global Functions

The versatility of selecting portions of a picture is incredible. There are more than a dozen ways you can select areas, such as color key, I-Shape or one of the area select tools.

Color key allows the selection of certain colors. This is a fast convenient way to isolate portions of an image. You can even define multiple key colors by combining this tool with the Union tool.

The I-Shapes are yet another amazing feature; they are customized selection tools that are easily loaded and saved. There are about 50 I-Shapes in Imagemaster R/t, including stars, city landscapes and geometric patterns. Creating your own is as simple as using the freehand tool to draw the shape you want and saving it as an I-Shape. Figure 8 shows an example of using an I-Shape with an image processing tool.

The quality of Imagemaster R/t is terrific, and once you get used to the interface, it becomes fast and easy to use. One of those must-have programs, Imagemaster R/t is truly worth the money considering that it has the ability to morph pictures, create wipes, do 24-bit paint, process and compose images and do color separations. This is a program you will keep using, and you will surely dream up new ways to process an image with each use.

VTU

Michael and Nicole Bushey own Bushey Video Productions, which specializes in modeling and animations.

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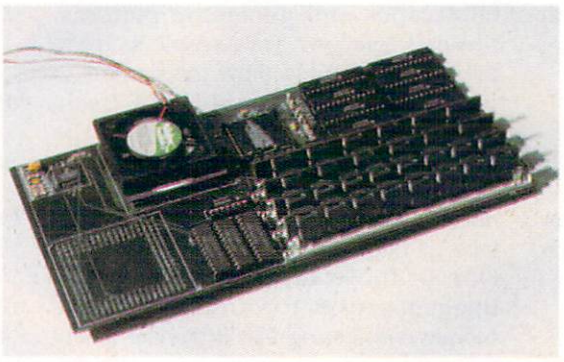
The RCS X-Calibur

Expansion Board for the Amiga 4000

by Christian Aubert

When I first got my Amiga 4000/68040, I loved the speed of the '040 CPU running on a fast system bus, especially compared to my old Amiga 2000/'030. 3D animation being what it is, I got used to the speed, and quickly overburdened my system with bigger scenes that demanded larger amounts of memory; soon my rendering times were back to what they were on my '030-based system. Then I heard about the X-Calibur from RCS Management.



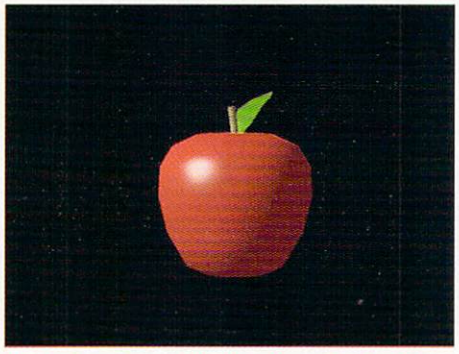
The X-Calibur is an accelerator and RAM expansion board for the Amiga 4000/'040. It is not a replacement board for the current '040 processor, but an upgrade to that CPU. It basically provides the processor with a direct access path to fast RAM that allows faster execution speed, since the CPU spends less time waiting for data to process. The X-Calibur can also be fitted with a faster processor and up to 128 MB of RAM (using 32 MB SIMM modules). I tested a 25MHz X-Calibur with 16 MB of RAM for this review, although a 33MHz version is available. Suggested retail prices are $1,199 and $1,699 for the 25MHz and 33MHz versions, respectively.

The installation can be performed by an experienced user, but RCS recommends that a qualified technician install the board. It involves removing the '040 CPU from its socket on the Commodore board, placing the X-Calibur board in the socket left vacant and finally placing the '040 CPU in the empty socket on the X-Calibur. You then must install SIMM modules on the X-Calibur to realize any performance gain. The simplest, easiest and cheapest way to do this is to remove the SIMMs on the motherboard and place them on the X-Calibur, which is the setup I have. There are four SIMM connectors, and they must be filled in pairs with 4-, 8-, 16- or 32 MB SIMMs. If you are using a 33MHz CPU, the memory present on the motherboard may not be fast enough to cope with the added speed (RCS recommends 60 nanosecond-rated RAM chips), and may need to be replaced.

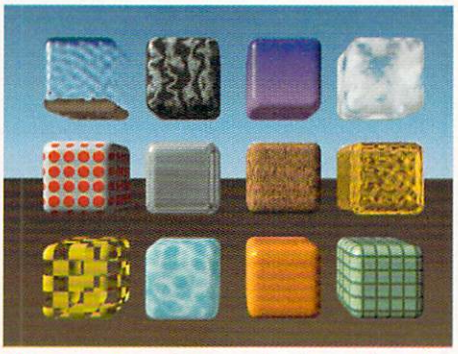
The board comes with an installation disk that performs the necessary modifications on your startup sequence and installs the required files for the X-Calibur to work properly. The next time you reboot, the accelerated memory kicks in.

After the X-Calibur was up and running, the first thing I did was perform benchmark tests. Sysinfo 3.1 rated my system exactly the same as a standard Amiga 4000/'040, which shouldn't be a surprise; the Speed benchmark code fits in the processor cache, voiding the X-Calibur's faster memory access. AIBB 6.5 gave more encouraging results, but it still only hinted at the power of the X-Calibur.

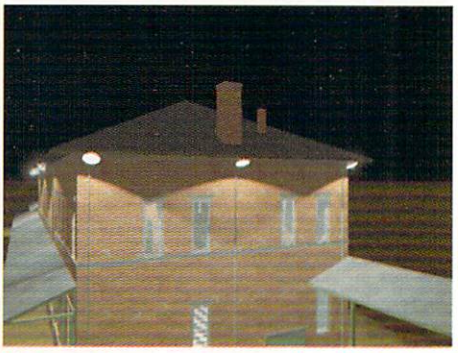
What really counts is the real-world applications test. All the software that I normally use for my work (DeluxePaint 4.6, Pixel 3D Pro, Art Department Professional 2.3, ProPage 4.0 and Toaster 3.0) performed flawlessly. Applications ran



The Apple test is simply loading the apple object from the phone book into LightWave and rendering.



The TextureExamples is rendered as is from the phone book.

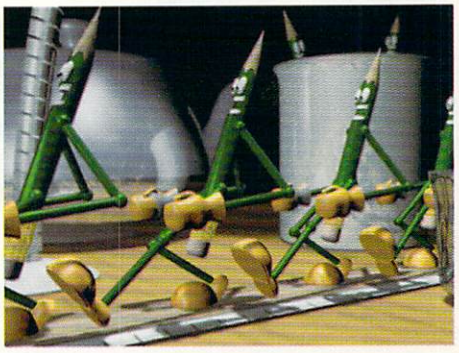


The Terminal scene contains more than 80 objects. It makes heavy use of Low Threshold Antialiasing.

Image	Amiga 4000	4000/X-Calibur	2000/GVP '040/33MHz
Apple	0:0:18	0:0:11	0:0:11
SR	1.0	1.64	1.64
Texture Examples	0:2:40	0:1:28	0:1:12
SR	1.0	1.82	2.22
Terminal	0:20:08	0:13:53	0:10:36
SR	1.0	1.45	1.90
Coneheads	5:50:00	4:08:00	3:21:00
SR	1.0	1.41	1.74

This comparative chart reflects the rendering speed differences between a stock Amiga 4000, an Amiga 4000 with the X-Calibur accelerator RAM expansion board and an Amiga 2000 with a GVP '040/33MHz accelerator. The first row reflects the image rendered and the time length in hours, minutes and seconds. The second row reflects the speed rating (SR); whereas the stock Amiga 4000 is the base time (1.0) and the X-Calibur and the Amiga 2000 are 1.x faster.

faster on the X-Calibur, by a factor of 10 to 100, with computationally intensive applications such as 3D rendering and fractals generation benefitting the most. All applications displayed an increase in responsiveness, which was most apparent with complex objects in Modeler or scenes in Layout. Batch processing of files with Fred and ADPro were also faster, especially



The Coneheads, made of approximately 200 objects, uses Shadow Maps, Depth of Field, High Antialiasing and Traced Reflections.

when using Loader, Saver and Operator caching. Hard-disk access is also noticeably faster, especially when using disk-caching software, thereby exploiting the faster memory access.

You can see the results of my LightWave tests in the comparative chart. The base comparison system is an Amiga 4000/'040 with 16 MB of fast RAM on the motherboard. The 4000/'040 X-Calibur is the same as the 4000/'040, with 16 MB of fast RAM moved onto the X-Calibur board, and the Amiga 2000 has a GVP '040/33 with 16 MB of fast RAM. As you can

continued on page 111

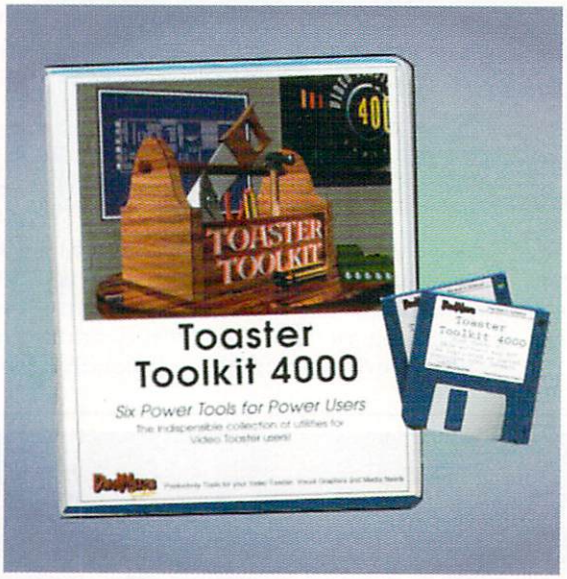
Toaster Toolkit 4000

Toaster Utilities Galore

by R. Shamms Mortier

Users of previous versions of Toaster Toolkit, a series of utility programs for the Toaster, are in for a pleasant surprise with the release of Toaster Toolkit 4000 ($179). Gone forever are both the kludgy interface and limited operations, and in their place are tools and an interface worthy of the new Toaster 4000 platform.

Once installed, the Toaster Toolkit 4000 (TT4000) drawer presents six separate utilities, each in its own drawer. An icon that says Config rests in its own place on the screen. When clicked upon, Config allows you to set the paths for three required directories: Toaster, Project and Framestores. Exactly why these paths are important has everything to do with what TT4000 does and the modules with which it works.



"Scripts can be loaded, saved, run, cleared and replaced with another."

The Heart of TT4000

The most important of the six modular programs in TT4000 is the Toaster Sequence Editor (TSE). The Toaster software was designed to allow users to have interactive control over sequences of effects and processes, but with ARexx programming as a prerequisite. TSE changes all of that, allowing you to create, execute, save and manipulate sequences graphically. However, TSE will create ARexx scripts directly from your interactions if desired.

TSE can be opened by using the CLI or by clicking on its icon. The first thing you do in TSE is load a Toaster Project. Even if you don't set the Project files path in the Config operation, once you set the path in a pop-up file requester, TSE remembers it for the next time you access this module. On the top of the TSE screen are the effects banks of the loaded Project. Double-clicking on any effect adds its name to the script area below. Effects in this list can be altered as if they were phrases in a word processor. They can be selected, cut, copied and pasted. Usually two lines load for an effect, showing its name and position in the bank and its speed. If you desire, you can edit the speed of an effect separately. All of the ARexx commands are shown in plain English in the display, which makes script creation understandable. Any ARexx script in memory can also be printed, which might help you become an ARexx programmer.

Two columns of additional gadgets are on the middle-bottom of the TSE interface. The Toaster software has to be up and running for you to engage some of these operations. Scripts can be loaded, saved, run, cleared and replaced with another. If your Toaster genlock is running, a separate button allows you to set the Preview and Program options for the Toaster genlock, including setting the Take and Auto transitions. (See your Toaster manual for further explanation of the genlock's actions.)

The Out button brings up yet another requester, which allows you to set various output options. Choices include outputting a test string, bringing up another targeted requester, sending text out of the serial port, or executing an ARexx or AmigaDOS command. A separate GPI trigger option currently is not fully supported. An advanced topics section of the TT4000 manual describes the output options in more detail.

The Loop option sets various parameters for a script, including specifying the start of a loop and the type of loop (number of times, duration of a specific time or continuous). Another gadget, Lend (LoopEND) marks the bottom of a loop. A third gadget allows the addition of text comments to a script. An Auto gadget adds an auto command after every targeted effect in the script from that point on. This allows the Toaster to run the effect automatically, load a CG page or do whatever the script states at that time.

continued on page 106

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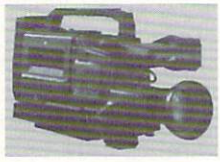

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Toaster Toolkit continued from page 104

Toaster Slide Show

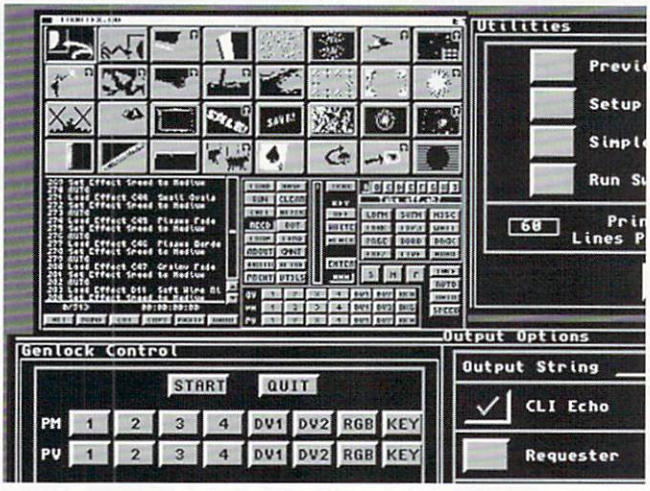
Have you ever wanted to generate a slide show automatically with the Toaster? TT4000's TSE makes that possible with the addition of a Script gadget. To operate Script, your slides must be in framestore format and in the same location on disk. If that's the case, the Script gadget will create an automated load of framestores. You can select and load them into two separate DV buffers. The framestores can have transitional effects between them, targeted in one of two ways: sequentially (one effect after another from any or all effect banks) or randomly from the same effect bank. This would obviously make you select—and possibly create beforehand—a bank of effects in a separate Project. By selecting No Effects, only one chosen effect will act as the transition between all slides. Additionally, general purpose interface (GPI) triggers can be integrated into a TT4000-generated slide show. The Slide option alone may be enough of a reason to purchase and use this software.

A Print gadget allows you to print the ARexx script (or the TSE script, which is a separate scripting alternative). A Utilities gadget has its own list of options. You can preview any framestore in grayscale, adjust and set the set-up paths, manipulate the serial configuration or run the Toaster Switcher (if it's not already running). This is also where the lines per page of the printer are set. A Test gadget starts a test of the printout itself.

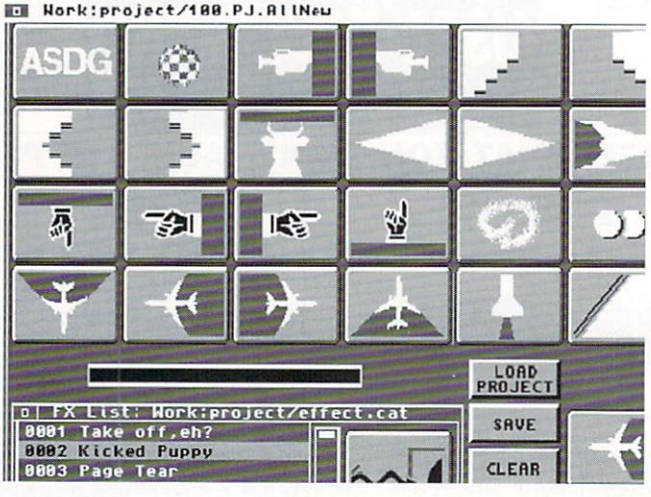
The program also includes controls for setting the Overlay, Preview and Program bus configurations. You can also address the TBar/Clip toggle, including the ability to set the TClip levels) and the Key colors, which are white, black and off.

A unique Misc menu allows you to QUIT the Switcher. It also provides for: NOPR (No Operation), USER (entering any Switcher ARexx command), TOWB (bringing Workbench to the front), TOSW (moving the Switcher screen to front), DURA (setting the duration in frames for looping animated effects, such as the Old Movie), FSDV (locating the framestore device), FMDL (deleting framestores), FSBD (updating the framestore list), PJDV (locating the project directory), PJDL (deleting a project), PJBD (updating a project list), LDTP/DPTP (loading and unloading the ToasterPaint slice), LDCG/ DPCG (loading and unloading the ToasterCG slice), LDLW/DPLW (loading and unloading the LightWave slice), GOLD (loading a frame on the Switcher screen), GOSA (saving a frame on the Switcher screen), GOFX (accessing the effects button on the Switcher screen), KEYP (cycling to the previous framestore or effect), and DOEN (loading and saving framestores or loading an effect). Other controls allow you to perform more loading and saving functions, freeze frames, motion removal and other needed operations with the click of the mouse button.

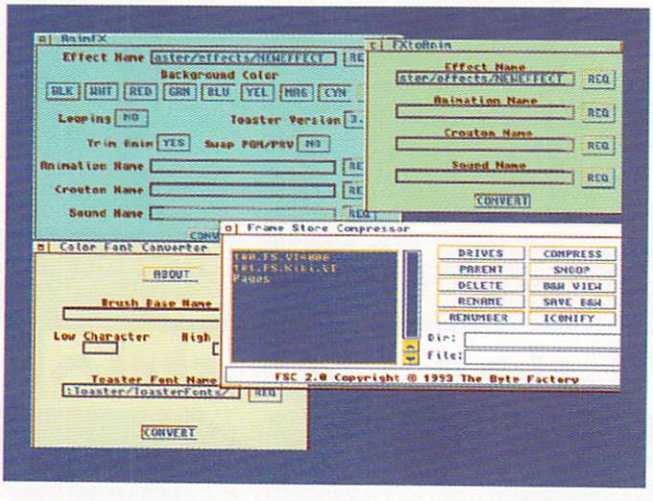
After completing a script, it can be saved in either ARexx or a special TSE format. The ARexx scripts can be edited with an ASCII text file editor, while the TSE scripts can be edited only in TSE. TSE scripts are compressed when saved and contain more information than their ARexx counterparts. Tutorials are included for creating scripts and samples are on file for manipulation.



The main Toaster Sequence screen is surrounded by some of the option menus, including Utilities, Genlock Options and Output Control.



The interface for the TT4000 Project Editor is intuitive to use and allows you to load new effects and move them to new positions in effect banks and save them out as unique Toaster projects.



Four other programs—AnimFX, FXtoAnim, ColorFont Converter and Framestore Compressor—come with the TT4000 package and appear in the Amiga's Workbench screen.

The Toaster Project Editor

The Project Editor is where new projects (collections of various effects in organized Switcher banks) are created and saved. After loading a targeted project that's already been saved, double-clicking on its crouton brings up a menu that lists the effect's graphic, name and speed. A special Test button previews the effect, although most effects assume you have the Switcher running for activating the preview option. These can be altered and saved out to the same effect.

A Catalog button loads the names of all possible effects into a scrollable list from which you can select any one and move onto the project playing field. A special Clipboard area allows instant access to your nine favorite effects. When you alter an old project or create a new one, simply save it to the Project directory. I have my personal favorites when it comes to effects. Others, I would never think of using. TPE allows me to group the selections that most fit my needs into a separate project and save it. This saves me time, money and production headaches.

Four More Modules

The FSCompressor, ColorFont Converter, AnimFX and FXtoAnim modules are less complex utilities than TSE or TPE, but they are nevertheless extremely useful. DS Compressor does what it says, crunching framestores into a smaller space by searching them out at your command or waiting in the background to automate compression targeted to a specific directory path. It also allows you to rename, renumber, delete and save black-and-white IFFs of framestore files.

The ColorFont Converter initiates ToasterCG font creation from information supplied by your standard Amiga fonts. The new fonts can be in up to 32 colors, or a special option creates 64-color AGA-based fonts (non-HAM). DeluxePaint IV AGA also is mentioned as an excellent source for generating EHB font brushes. The conversions add greatly to your ToasterFont capabilities, in addition to giving you instant access to your font-based logos.

AnimFX and FXtoAnim transform IFF animation into Toaster Switcher effects and the reverse. A strict set of guidelines are listed in the manual for each operation. You can choose the color of the background for Action/Sports effects and loop them and SoundFX for Toaster 3.0 and 4000 systems. Sample animations to experiment with are contained in the AnimFX drawer. By using FXtoAnim and reversing the operation, you can alter any of the effects already resident in the projects and save them with new names (or rewrite the old ones). Together, these programs give you an unlimited amount of unique effects at your disposal.

The Bottom Line

Anyone familiar with the first release of this software will be taken aback by its new interface and the long list of new and improved options. The manual is 100 times clearer and much friendlier than the old version, and the software fully supports the Amiga 4000 and 3.0 Toaster software. Although not available at the time of this writing, the upcoming release of CroutonTools 4000 will add even more features to this software, including the capability to access and run its competitors' wares. TT4000 and associated products are being marketed through DevWare Inc. and are priced economically for the market. In addition, DevWare has a great service record.

My advice? Get this software if you have anything to do with the Toaster, especially if you desire easier access to the Switcher effects with infinite unique variations.

VTU

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WaveLink & Anim Workshop 2

Axiom Serves up Two Tasty Tools for Animators

by Brent Malnack

Axiom Software, developers of the popular Pixel 3D Professional program, has released a couple of great new tools for the Toaster and Amiga community: WaveLink and Anim Workshop 2.

WaveLink

If you took advantage of NewTek's double-up upgrade program last summer, you have two Video Toaster systems. This makes you a prime candidate for WaveLink.

WaveLink is essentially a networking program that allows two connected computers to share resources, such as hard drive space, files and programs. It enables two Toaster systems to render the same LightWave animation simultaneously, thus reducing the rendering time by as much as 50 percent.

How It Works

WaveLink consists of software and a custom cable that connects two Amigas via their parallel ports. The software includes an enhanced version of the public domain program ParNet, along with Axiom's custom WaveLink program, which controls the LightWave rendering process.

Installing the software and cable takes just a few minutes and you are ready to go. Once connected, WaveLink will ask you to specify which LightWave scene you wish to render. After you've made the selection, a few more questions need to be answered, such as where the rendered images will be stored, what type of images will be saved (framestores or RGB images) and which frames to render. Once WaveLink has the information, it can begin.

Rendering

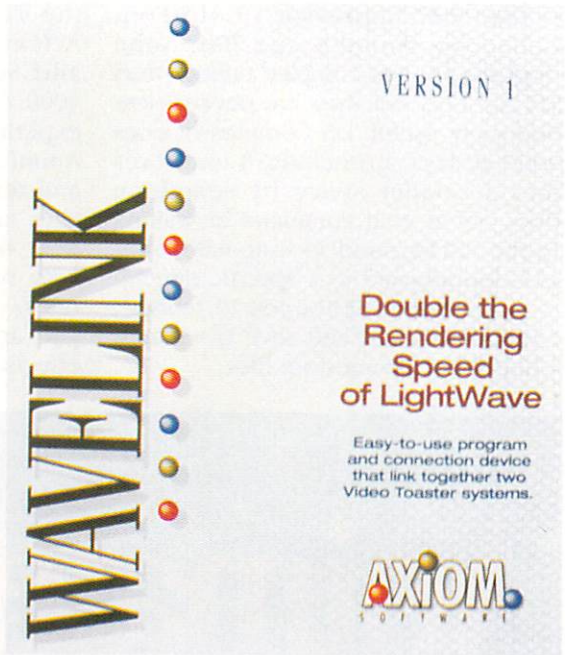
WaveLink sends individual frames to each machine to render, so in the purest sense, it is not a distributive rendering system. In other words, if you are only rendering one frame and not an animation, only one machine is used. It does not render any faster. However, if multiple frames are being rendered, WaveLink instructs the first machine to render frame one and starts the second machine rendering frame two simultaneously. This process continues throughout the rendering process.

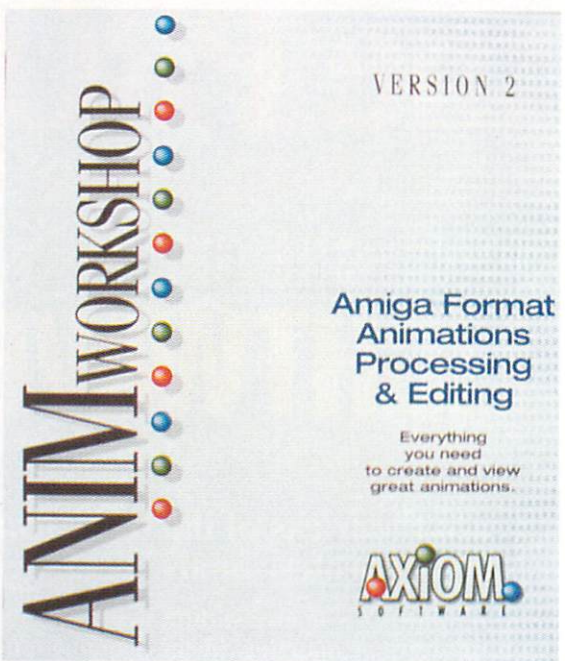
If the two machines involved are identical (equal RAM, accelerators, etc.), WaveLink will cut the rendering time in half. If one machine is faster than the other, the rendering time is not quite one-half.

This arrangement might have been a problem for users of Digital Processing Systems' Personal Animation Recorder (PAR), especially when one machine finished rendering its frame before the second. However, Axiom has included the ability to store files temporarily until sequential frames have been rendered and it's time to move on to the next frame. This operation is entirely transparent to the user.

In this instance, the program automatically creates a temporary storage directory for the files. (WaveLink allows you to specify where.) Images that

continued on page 110





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WaveLink continued from page 108

are out of sequence are stored there until the proper frame count is achieved. The greater the inequity in computing speed between the machines, the larger this temporary storage directory becomes. For example, my 68040-based Amiga 2000 can render frames more than twice as fast as my 68040 Amiga 4000. As I'm rendering frames, though, the following problem can occur.

The 2000 renders a frame in about one minute, while the 4000 takes two minutes and 15 seconds. At the start of the process, the 2000 renders frame one and the 4000 renders frame two. Next, the 2000 renders frame three. At this time, frame three can be completed on the 2000 before the 4000 finishes frame number two.

Thus, if the PAR is waiting for frames, it is possible that frame three could get there before frame two. Because the PAR doesn't know any better, it gladly accepts the frames in the order that they're sent. WaveLink then renders the images into a temporary directory before doling them out to the PAR in the right sequence. It can even delete these images when finished, so your Amiga hard drive never has to store too many.

If you're not using a PAR, once all of the frames have been rendered, they can be recorded to videotape in the traditional manner, or joined into an animation with Axiom's other new product, Anim Workshop 2.

Many Uses

Although WaveLink is great for rendering LightWave animations, its ability to allow two machines to share resources is nearly as impressive. This is especially true if one of the machines becomes low on hard-drive storage space. With WaveLink, files may be copied or rendered directly to the other machine. Even most programs that reside on the other machine can be run remotely. For example, only one of my machines has DeluxePaint. If necessary, I can run DeluxePaint on the second as though it were installed on its hard drive.

Once you start using WaveLink, it will be hard to stop; it will become a tool that you will enjoy for a long time.

The documentation for WaveLink is great. Although brief (24 pages), it's a friendly manual with a helpful, troubleshooting section and all of the information necessary to run the program is presented. The manual is a tribute to fine programming by Axiom.

A Limitation

Because of the nature of ParNet, it is not possible to expand the network beyond two machines. Users of larger Toaster rendering farms will need to investigate other products. Still, this program remains a cost-effective way to tie two Toaster systems together.

Figure 1—Anim Workshop 2 allows playback in up to 256,000 colors.

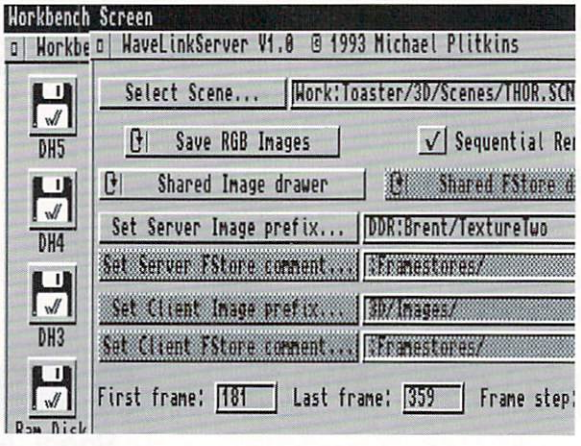


Figure 2—WaveLink enables two Toaster systems to render the same LightWave animation simultaneously.

Anim Workshop 2

Another great tool from Axiom is Anim Workshop. This animation processing and editing package allows the user to perform effects on an entire animation that once were restricted to a single image.

The program can perform its duties in many ways. If you happen to have Great Valley Product's ImageFX or ASDG's Art Department Professional (ADPro), you'll get the most out of Anim Workshop. If not, the program can still be used for numerous tasks, the most important of which is the ability to convert Amiga images into animations. (Using 24-bit files requires ADPro or ImageFX.)

AGA Support

With this new version, Axiom has added support for AGA-based machines, such as the Amiga 4000. This allows animation playback in up to 256,000 colors. Although similar to NewTek's animation playback in the 4000, Anim Workshop is much more flexible. NewTek's format is proprietary, which means that the animation files cannot be modified with third-party programs. Additionally, because of the exorbitant RAM requirements, some animations aren't easily rendered in LightWave. These are now possible to record with Anim Workshop.

Animations can also be treated as though they are individual frames with Anim Workshop. An ADPro function, such as Emboss-ing, can be applied to the entire animation. In addition to working with the effects in ImageFX and ADPro, Anim Workshop provides a host of its own effects, such as flipping an animation, scaling it, compositing multiple animations or even editing animations by inserting new animations or images. In short, nearly everything you would ever want to do with an animation can be accomplished with Anim Workshop and either ImageFX or ADPro. In addition, animations can be edited with frame-accurate precision, and the program can expand animations by allowing the user to pause on a specific frame.

Speed

All operations in Anim Workshop 2 buzzed right along on my Amiga 4000. Axiom has created a highly functional user interface with a program that requires few steps to accomplish even the most complicated tasks.

Audio

Besides processing visuals well, Anim Workshop can add audio samples and music to an animation. This feature is great for synchronizing a cel animation with an audio track. If you have a character that needs to speak, you could easily time the mouth movements with the audio soundtrack. Anim Workshop allows you to specify the starting frame for audio playback, so accuracy is not a problem.

The program supports the IFF 8SVX sound format and up to four channels. Volume levels can be adjusted, and priorities can be set for the sounds so that the most important sound will happen regardless of other audio activity. With all of these options, a user can build an elaborate soundtrack for an animation. Keep in mind that the quality of the sound samples is limited to what a stock Amiga can generate. At the moment, there is no support for high-quality boards, such as SunRize Industries' Studio 16.

Documentation

Axiom has once again provided excellent documentation. The desired information is easy to find and the included tutorials make you feel comfortable with the program in a short amount of time.

The Bottom Line

Creating and modifying animations with Anim Workshop is a breeze. The most difficult question is whether or not you need the program. If you have a Toaster 4000 system, Anim Workshop is only beneficial to those wanting more than what NewTek has provided in terms of real-time animation playback. Certainly, Anim Workshop is more powerful and more flexible. If you intend to distribute your animations to non-Toaster users, Anim Workshop is essential.

With support for all popular Amiga animation formats, Anim Workshop can create an animation capable of playing back on any Amiga if it has enough RAM.

Toaster 4000 users will find that they are more likely to use Anim Workshop than the LightWave Preview Anims. While the Toaster occasionally places restrictions on the animations you can create, Anim Workshop will do a good job with just about anything you throw at it. While it cannot guarantee 30 frames per second playback in all instances, Anim Workshop should be sufficient for most tasks.

For LightWave animators who do not have a traditional single frame controller or the PAR, Anim Workshop may be just the ticket.

VTU

Company Mentioned:

Axiom Software
1668 E. Cliff Road
Burnsville, MN 55337-1300
(612) 894-0596; Fax (612) 894-1127
Circle Reader Service No. 14

X–Calibur continued from page 103

The RCS X–Calibur

see, the X-Calibur still lags behind a 33MHz system in rendering times, but with equal processors, it should take the lead; a 40MHz version was already nearing completion as of this writing. All Amiga 4000 and Toaster 4000 users can benefit from a faster system, and with the X-Calibur they can get the fastest Amiga on the block.

Christian Aubert is a freelance computer graphics artist, focusing on 3D graphics for the past five years. He can be reached on WaveRider BBS at (418) 871-8079.

VTU

Companies Mentioned:

In Canada, contact:
RCS Management
6955 Taschereau Blvd., Ste. 211
Brossard, Qc.
Canada J42 1A2
(514) 926-3755; Fax (514) 926-3131
Circle Reader Service No. 15

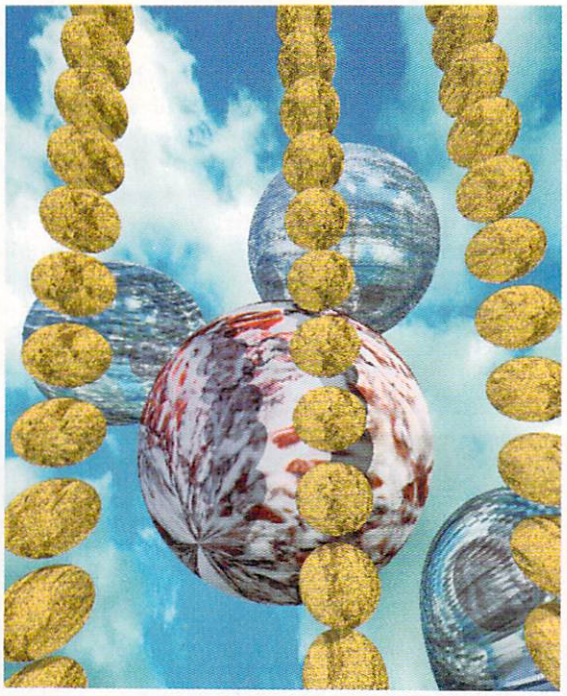
In the U.S.A., contact:
Micro R&D
P.O. Box 130
Loup City, NE 68853
(800) 527-8797; Fax (308) 745-1246
Circle Rader Service No. 16

All About Maps, Part 3

Tackling Complex Shapes with Cylindrical Mapping

by Mojo

Welcome to the final installment of this series on basic texture and image mapping. Now that we've moved from the introduction to mapping through how to apply maps, let's tackle more complex objects.



Cylindrical Mapping

Flat shapes were covered last month with planar image mapping. Unfortunately, the world isn't flat and neither is the world of 3D. More complex shapes require complicated mapping; cylindrical mapping is here to help.

This form of map should be used on objects that resemble—you guessed it—a cylinder! Cans, bottles, rocket engines, pipes, and blow torches are all likely candidates for this type of mapping. If you were to apply a planar image map to one of these shapes, the image would not align properly and streaked sides would result. A cylindrical map, when properly applied, will wrap itself around your object and maintain its correct orientation. A good object to practice with would be the trusty pop can, which can be found in the objects directory of any version of the Video Toaster.

"A cylindrical map, when properly applied, will wrap itself around your object and maintain its correct orientation."

Why?

As stated last issue, an object must be mapped according to its orientation in Modeler. The pop can was built standing straight up and must therefore be mapped along the Y axis. When modeling, it's a good idea to try and keep all cylindrical objects oriented along Y. Your maps will be easier to draw and the object can be rotated later into any desired position in Layout.

Figure 1 is a simple example of an image designed to be cylindrically mapped onto the pop can. Try to create these maps to full-screen width whenever possible, since proper side-to-side cropping of these maps (automatic when saving a full-width image) can be crucial. To set the height correctly, make an estimate and draw a few squares into the map. Apply it to your object, render it and see how distorted the squares turn out. Trim or add to the map's height based on the results.

The tricky part of creating a cylindrical map is dealing with the seam. When LightWave wraps an image, the left and right sides will meet behind your object, creating a visible seam. If this side of the object will be seen, it is important to create a *seamless* image map.

Notice how the ingredients box of the map in Figure 1 seems oddly broken up. However, if you imagine this image wrapped around the can, you'll see that the ends meet and form a cohesive image. If you have trouble imagining it, take a look at the rendered can in Figure 2.

But Wait, There's More?

Although planar and cylindrical are the two most common forms of mapping, even a rudimentary glance at the Texture pull-down menu reveals quite a few more. Spherical and Cubic, however, are the only remaining image map choices, and both are quite easy to use.

Spherical mapping is designed to allow you to wrap an image around a sphere. Planets, billiard balls and fruit come to mind.

continued on page 114

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VTU

All About Maps continued from page 112

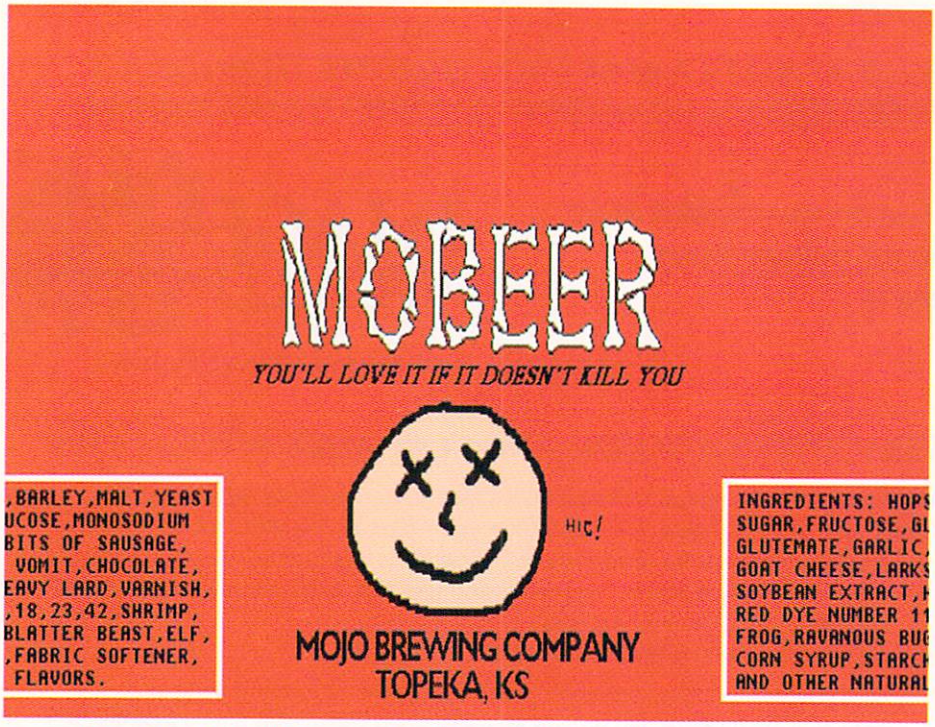


Figure 1: This is a DeluxePaint beer label meant to be applied as a cylindrical map to the Toaster's pop can object.

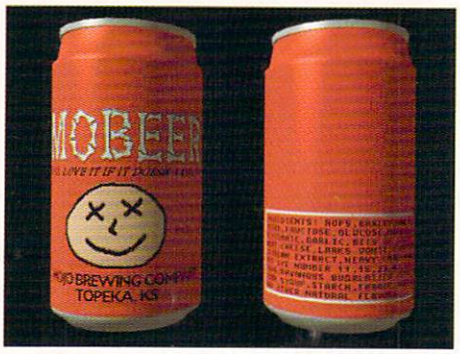


Figure 2: When a flat image is wrapped around a sphere, as in a label attached to a can, distortion can occur. As you can see in this final rendering, the split ingredients come together nicely when the opposite ends of the image meet.

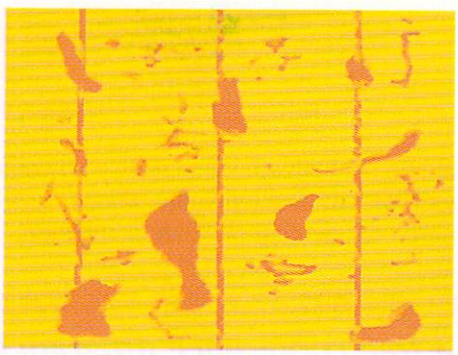


Figure 3B: Here is a simple DeluxePaint map of banana skin gone bad. Once it is applied to the banana object, the texture will stick the the fruit like glue. This map has been applied to the objects in Figures 3, 4 and 5.

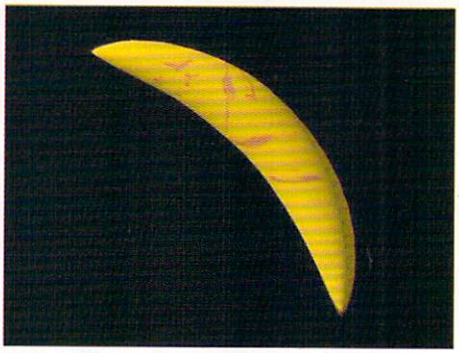


Figure 3: Here is a banana without a morph target to provide proper texture orientation.

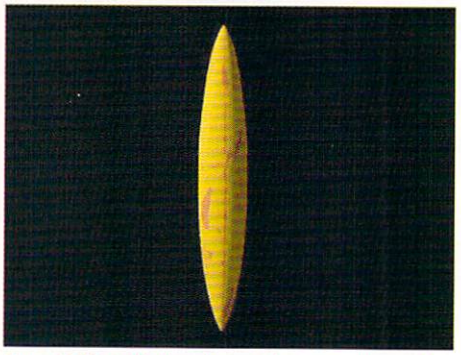


Figure 4: This is the base banana object prior to morphing but properly mapped. As in the case with all morphs, mapping is done to the original object; the morph target is simply an object of shape instructions to the original. Leave it alone.

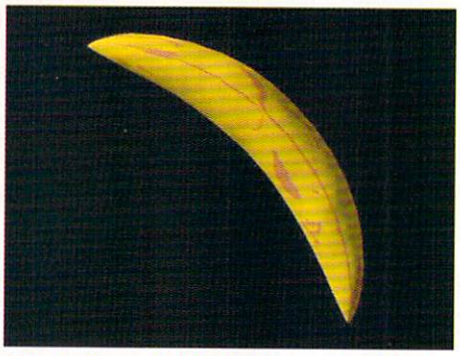


Figure 5: The morphed, finished banana. Notice how the texture follows the contours of the object.

Map creation can be especially difficult in this case. When a flat image is wrapped around a sphere, distortion is inevitable. However, the distortion occurs mostly at the poles of your object, so try to keep a lot of blank space at the top and bottom of your map (this is why most of the planets in *Babylon 5* deliberately have white polar caps).

Mapping simple objects, such as tables and boxes, used to be a pain in the neck. Each axis (X, Y and Z) had to be named separately in Modeler and mapped individually to avoid image streaking. However, the modern miracle of cubic image mapping makes life much easier.

When an image is applied to an object in this fashion, LightWave planar maps it in all directions simultaneously. The results will be easier to predict if your box is an exact cube. If the surface is oblong with the X axis longer than Z and you use automatic sizing, the image will appear stretched in the X direction. To avoid image distortion, a good rule of thumb is to automatically size the map and then numerically make sure all values along X, Y, and Z are the same, adjusting size to taste (I usually go with smaller values).

Keep in mind that image seams may be visible on any object that has been cubically mapped in a haphazard fashion. Seamless textures eliminate this problem although it is usually unnoticeable with generic maps, such as dirt, wood grain, marble and other purely textural images. (On *Babylon 5*, almost all background detail is cubically mapped with generic dirt and panels; since the camera never gets very close to it, the seams remain undetectable.)

The Banana Syndrome

As explained last time, texture maps like to move in a linear fashion. This makes mapping non-linear shapes difficult. Take the case of the banana, which looks like a simple shape to map. Well, it's sort of cylindrical in shape, so how about a cylindrical map? Ah, good guess, but what about that nasty curve? The map will have a devil of a time figuring out where the object center is and the image will inevitably look wrong since maps can only move in a straight line.

Figure 3 is a bent banana object with a DeluxePaint map of lines and brown spots (Figure 3B). The object is mapped cylindrically on Y, but as explained above, the map moves straight; the lines don't follow the shape and the splotches don't cover the entire surface. There is no error—this is simply the way mapping works.

To map the banana properly, the object needs to be created in a straight line, mapped, and then bent into shape (once an image map is applied it will stick to an object like glue and bend with it, regardless of how it is distorted—either through morphing, bones or a displacement map). In this case, the banana was created unbent, then shaped using Bend in Modeler and saved as a morph target.

In Layout, the banana object is again mapped cylindrically along Y (Figure 4). The mapping is correct, but bananas aren't straight. By giving this rigid banana a morph target of the bent banana, it now has the proper shape and the map has morphed with it. Add a subtle bump map, and we're set. See Figure 5. [Note: Instead of morphing, the straight banana could also have been bent into shape with bones.]

Object morphing for texture accuracy is a powerful trick. Another example of its use is in Allen Hastings' Tunnel image (a Porsche speeding through a subterranean tunnel). By creating a straight tunnel and ground and then morphing it into a curved object, he was able to draw all his maps (including the dotted highway) in a straight line. This simple technique saved him hours of headaches trying to create a curved map.

This technique also allows you to have textures *move* in any desired path. As with map application, texture direction only occurs in a straight line. Let's say you were creating a bending tube and wanted it to look as if something were moving through it. Adding fractal noise with a velocity should do the trick, but since the noise moves straight, it will appear to move *through* the bent tube and not *with* it. By creating a straight tube and morphing it into a bent shape, the noise will morph with it and follow the shape of the tube. The rings of the planet Saturn were also created this way and are fully illustrated in the Video Toaster 3.0/4000 LightWave manual.

Hope It's Been Helpful

This series has exemplified the importance of mapping in the 3D animation universe. As stated at the onset, building your model is only the first step. As with those plastic hobby kits you may have built years ago, making your model look like the photo on the box involves much more than a tube of glue; decals and painting are the final steps that help cross the line between a hunk of plastic and a work of art. LightWave and Modeler are just two of the many tools you can use to create 3D—don't ignore the rest.

Special thanks to Ron Thornton and Allen Hastings for their assistance with this series.

VTU

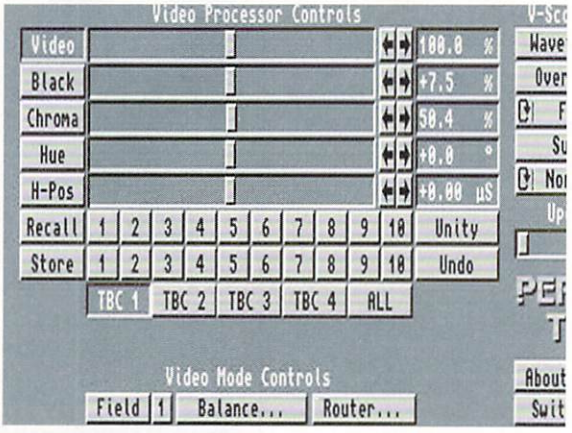
Mojo began animating with an Etch-A-Sketch at the tender age of 14 while growing up in Moosebreath, Montana. He was found roaming the streets of Los Angeles many years later with a cardboard sign upon which was scribbled, "Will Animate for Food." He was taken in by master chef and 3D hobbyist Ron Thornton, who taught him about eating utensils and fractal-noise. Mojo currently tries to convince others that he works on Babylon 5 *and is looking for a good Swedish Meatballs recipe.*

Rotoscoping

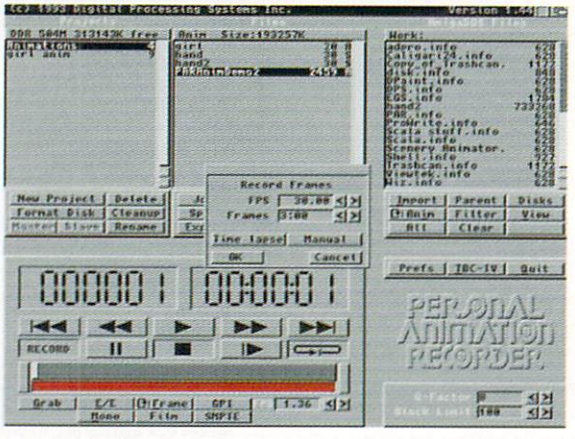
Manipulating Your Video Toaster Frames

by Matt Drabick

Rotoscoping is the process of capturing video onto your computer's hard drive, manipulating each frame using a paint program or image processor, and then recording the frames back to tape. The origins of rotoscoping date back at least 75 years, when cartoon animators often traced the outlines of people and animals from motion picture film and used their outlines as a guide for creating characters. The technique greatly simplified the process of creating cartoons with very fluid and realistic character movement.



A screen shot from the DPS TBC-IV control panel at 640x200 pixels and 16 colors.



A screen shot from the DPS PAR control panel at 640x400 pixels and 16 colors.

Why Rotoscoping?

Rotoscoping is performed for corrective and/or artistic reasons. Perhaps some remote location footage has a jet airliner's exhaust spoiling an otherwise perfect shot that would be extremely difficult and costly to reshoot. Rotoscoping could be used to remove the exhaust contrails on a frame-by-frame basis. More often, rotoscoping is used for a certain style or look or to even establish a mood within a scene. By adding soft pastel streaks to a series of frames, a dream sequence can be produced. Vibrantly colored, animated lines can add energy and excitement to an otherwise static shot. Color footage can be converted to black and white, with the subject left in color for emphasis. An animated phaser beam can be added to the weapon being held in an actor's hand. Cartoon characters can be painted onto live footage, and an animated mouth and eyes can be added to an animal's face for comic effect. Simply put, rotoscoping can be used to manipulate a video sequence using a variety of techniques similar to those of traditional cel animation.

Fruitful but Laborious

The process of rotoscoping is labor intensive.

After capturing the video footage onto your hard drive, each frame must be manipulated by hand using a paint program such as ToasterPaint. In 3D animation, the artist creates the models, defines the attributes, lighting and motion path and then dedicates time to something else while the computer renders. In contrast, rotoscoping requires a great deal of time and involvement on the user's part. For this reason, rotoscoping is a costly and highly specialized service. Depending on the technique used, a good day's work might result in 15 or 20 finished frames. To help simplify the process, when rotoscoping for artistic purposes, perhaps every fifth frame will be changed and the rest ignored. By skipping frames, less time and effort is required and quick dissolves can be used between frames to add an interesting effect.

A Simpler Way with ADPro

Another way to simplify the process is to perform batch-processing using Art Department Professional (ADPro) 2.3 with either MultiFrame or ProControl (a version of MultiFrame is reportedly being developed for ImageFX). By using the special-effects operators found with ADPro, a sequence of frames can be automatically converted into charcoal or oil painting versions, be embossed, or turned into negative versions of themselves. After using the antique operator to add a sepia tint, each frame can have vertical scratches added by using a paint program to simulate old documentary footage. While batch processing captured video can be relatively quick and effective, the changes are made on a

global basis. Batch processing isn't an easy way to add colorful vibrating lines to a sequence of frames or to create a cartoon character. For most techniques, rotoscoping still requires an artist to hand-paint each frame.

Video Capture, for a Price

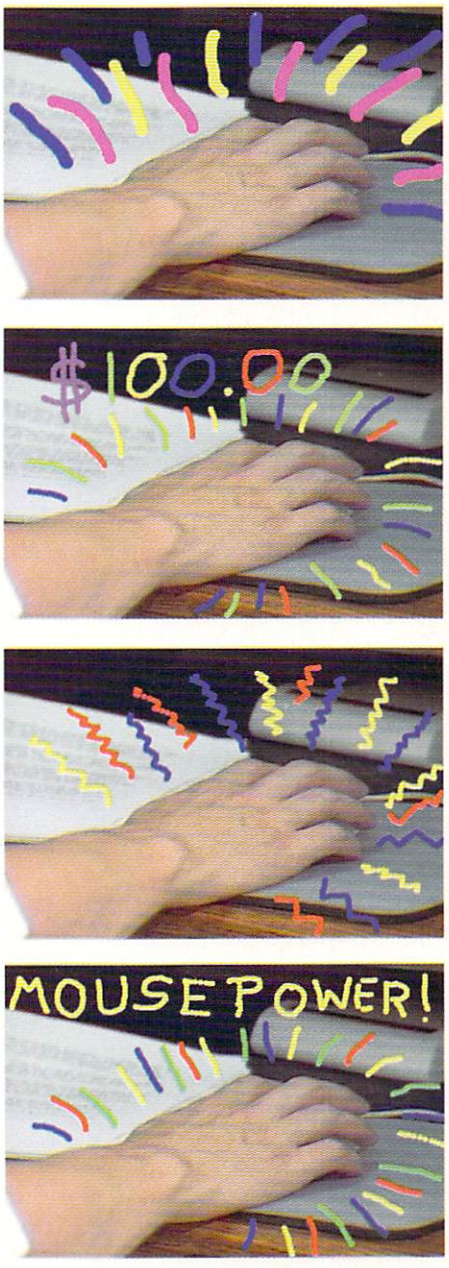
Until recently, capturing sequential frames of videotape onto your Toaster's hard drive required a single frame controller such as the BCD-2000A or the Personal SFC from Nucleus Electronics, plus a fairly expensive frame-accurate VCR equipped with time code. The single frame controller prerolls the videotape using time code to track the tape's position. Then the tape rolls forward and the Toaster's framegrabber captures the frame at the correct time and saves it. The videotape is rewound and the process is repeated again and again with each pass always starting a frame later until the sequence of frames has been captured onto the hard drive. The single-frame controller and VCR can then be used to record the frames back out to tape after any painting or image processing has been performed.

An even more expensive solution is to use an optical disc recorder such as the Panasonic TQ-3031F to capture video in real time to a laser disc. Once captured, the disc can be manually advanced and each frame grabbed using the Video Toaster or even a slow-scan digitizer such as DCTV. An ARexx script can be used to automatically advance the optical disc recorder and capture the frames.

DPS' Cost Alternative

With the arrival of the TBC-IV ($999) and the Personal Animation Recorder or PAR ($1,995) from Digital Processing Systems (DPS), cost-effective, real-time video capture and playback can now be performed on the Amiga and Video Toaster using a dedicated hard drive. The PAR can also be used for playing back LightWave animations in real time, while the TBC-IV can be used as a manual framegrabber plus an infinite-window time base corrector with both composite and Y/C video inputs. Because the video is captured in real time using an infinite-window TBC, both consumer and professional VCRs and camcorders can be used. A frame-accurate VCR with time-code support isn't required.

Another advantage is the ability to record the incoming signal as Y/C video, resulting in a cleaner signal with higher resolution and better color fidelity. Once captured, those frames can be easily converted into standard Amiga IFF-24 files and loaded into a paint program such as



These are framegrabbed images of a hand holding a computer mouse with colorful lines added, all at 752x480 pixels and 24-bit color.

ToasterPaint, DCTVPaint, TVPaint, etc. After the frames have been manipulated, they can be converted back onto the PAR's hard drive for real-time video playback.

When used together, the TBC-IV and PAR require two adjacent expansion slots in an Amiga 2000, 3000 or 4000. A short cable connects the two devices so they can talk to each other. When used with the PAR, the TBC-IV doesn't require the Amiga's serial port. Don't forget to connect the TBC-IV's composite video output to the genlock input on the PAR. If you don't, the result will be drifting, out-of-phase video. I also discovered that I had to slightly adjust the PAR's subcarrier control to get a good, stable signal without any color shifts.

Both the TBC-IV and PAR have their own software which needs to be installed onto a hard drive. The PAR also requires at least 1.2 MB of system memory and Workbench 2.0 or higher. In addition to the PAR's dedicated hard drive (currently a Seagate 3600A or the newer 3655A), you will want a large AmigaDOS hard drive for storing the converted and captured frames from the PAR's hard drive. DPS is reportedly working on a comb-filter module that can be added to the TBC-IV for even cleaner video captures. Finally, support is now included with the PAR for controlling the AD516 audio board from SunRize, allowing 16-bit audio tracks to be played back in sync with video clips and animations.

Capturing video from a camcorder or VCR with the TBC-IV/PAR is very easy. Once the hardware and software have been installed and a video source connected to the TBC-IV's composite or Y/C video inputs, start the TBC-IV and PAR software. With the PAR control panel displayed on your monitor (you can easily jump from the PAR, TBC-IV and Toaster Switcher screens), click on the E/E button at the bottom of the screen. This allows the user to monitor the incoming video signal while preparing to capture the desired video sequence. To capture the sequence, simply click on the record button included with the VCR-style control panel. A requester will appear asking for the frame rate to be used (the default setting is 30 frames per second, but lesser values are allowed for fast-motion and strobing effects) and the number of frames to be captured. After clicking on the OK button, the sequence will be automatically captured to the PAR's hard drive. Note that footage can be captured in black and white by using the Mono button beneath the E/E button.

You will need to pay attention to the Q-factor and block limit settings used by the PAR when capturing

video. While higher values will result in a better-looking capture, excessively high values will abort the process, due to the PAR's inability to capture the video in real time. Start with lower settings such as a Q-factor of 8 and a block limit of 100. Don't forget to hit return after typing in each new value. With a little practice, you will find which values work best for capturing video. The new Seagate 3655A hard drive can capture video sequences at higher settings than the earlier Seagate 3600A drive and delivers a better-looking video signal during playback. While the 3655A drive does limit captured video segments to two minutes or less, this is more than adequate for most situations.

Once the frames have been captured onto the PAR's hard drive, they can be automatically converted to IFF-24 frames and stored onto an AmigaDOS hard drive for loading into a paint program. If working with ToasterPaint, try loading the first image from the sequence and filling the swap screen with a white background. Turn on the Rub-Thru function and with the solid, freehand paint tool, start erasing the white screen to reveal the image underneath. Use the Undo command if necessary until you find the scene's subject. Using long brush strokes, selectively reveal part of the screen. Use this technique over the entire sequence of frames; don't be afraid to experiment. Instead of using the Rub-Thru tool and the swap screen, add some squiggly lines to the sequence instead.

When you have a sequence of hand-painted frames, convert them back onto the PAR's hard drive using the supplied conversion software to create a new animation. After the animation has been compiled, click on the Play button and admire your handiwork.

The PAR's image quality with captured video is surprisingly good and acceptable for many applications. Because the PAR uses a version of JPEG compression, there is some image loss and artifacting with captured video. As the comb-filter module from DPS and faster hard drives become available, this will become less of a concern. Just remember that when you're performing rotoscoping for correction purposes, after capturing and painting each frame in the sequence, you will expect the playback to look as good as the original footage. Depending on the particular application and what the user (and client) considers to be acceptable image quality, the PAR is up to the job. For artistic purposes where each frame is going to be painted and dramatically changed anyway, the PAR's image quality with captured video isn't an issue.

TVPaint Professional

A longstanding weakness of the Video Toaster is its resident paint program, ToasterPaint. Some Toaster users own a Firecracker24 or DCTV to have access to a better paint program. Another solution is to use a Retina high-resolution display card from MacroSystemUS and the paint program TVPaint Professional. TVPaint's airbrush tool provides variable tip sizes, flow patterns and flow rates and has its own preview window for experimentation purposes. The airbrush tool can be modified to spray more paint at the edges than at the center of the pattern or even spray using concentric circles. Another strong feature of TVPaint is the Rub-Through or Transparency mode, which allows a second image to be loaded using the spare screen and selectively revealed. For artistic purposes, the Airbrush and Transparency tools alone are worth $899 for both the Retina and TVPaint Professional.

VLab

VLab, Macro SystemUS's real-time digitizer, offers another solution for capturing video to Toaster owners who don't want to purchase the TBC-IV, or who own a VCR with a built-in animation controller but no frame-grabbing ability (the Sanyo GVR-S950 is a good example of such a VCR). Two internal versions of the VLab are available, one with composite video inputs only ($499.95) and another with both composite and Y/C video inputs ($599.95). System requirements include Workbench 2.0 or higher, while 2 MB of RAM and a hard drive are highly recommended.

The VLab provides exceptionally clean framegrabbing, especially when using Y/C video input. Images can be digitized as either frames or fields of video using either 360 or 720 horizontal pixels. Images can also be digitized in color or black and white; a time-base corrector isn't necessary for working with the output from a VCR or camcorder.

An advanced feature of the VLab is the IFR (Interleaved Frame Recording) function which allows frames to be sequentially grabbed from videotape. Strictly a semiautomatic function, IFR allows the VLab to grab frames from any professional or consumer VCR without using time code or any physical connection between the VLab and VCR. A single frame controller isn't required. After manually rolling the videotape, the user defines a keyframe followed by the first frame of the sequence to be captured by the VLab. Then the videotape is manually rolled again while the VLab searches for the keyframe. Once the keyframe has been found, the VLab starts counting frames until it reaches the first frame of the sequence to be captured and immediately starts grabbing frames as fast as it can. Using my Amiga 4000, I was able to capture and save every fifth frame (.0000, .0005, .0010) onto my hard drive. Once the initial sequence of frames has been captured, the videotape is manually rewound and the process repeated starting with the second frame of the sequence (.0001, .0006, .0011). The process is repeated again and again, always starting with the next frame in a staggered fashion, until the entire sequence of frames has been digitized and saved to the Amiga's hard drive.

While VLab costs less than the TBC-IV, unless you already own an optical disc recorder or a VCR such as the Sanyo GVR-S950, I would purchase the TBC-IV and PAR instead. For the money, the TBC-IV/PAR represents the easiest and most cost-effective way for performing rotoscoping with the Amiga and the Video Toaster.

VTU

Companies Mentioned:

Digital Processing Systems
11 Spiral Drive, Ste. 110
Florence, KY 41042
(606) 371-5533
Circle Reader Service No. 17

MacroSystemUS
24282 Lynwood, Ste. 101
Novi, MN 48374
(313) 347-6266
Circle Reader Service No. 18

ASDG
925 Stewart St.
Madison, WI 53713
(608) 273-6585
Circle Reader Service No. 19

T.S. Computers

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Toaster Talk continued from page 8

TOASTER TALK

Ms. Tomlin's presence on stage with the vice president is symbolic. In character as Ernestine the operator, she embodies many of the special interests, including the television, telephone and cable TV industries, that the administration has invited to advise it on telecommunications policy.

The membership roster on a new federal committee (co-chaired by Commerce Secretary Ron Brown) to advise the administration on information policy reads like a Who's Who of high-tech business. Members include Bert Roberts, chairman of MCI Communications Corp; John Sculley, former Apple Computer chairman; George Heilmeier, Bellcore chief executive officer; Ed McCracken, chief executive officer of Silicon Graphics; Alex Mandl, chief executive officer of AT&T's Communications Services Group; John Cooke, president of the Disney Channel; Nathan Myhrvoid, senior vice president of Microsoft Corp.; and Robert Johnson of Black Entertainment Television.

In fairness to the administration, at least two ordinary folks, a grade-school teacher and an advocate of the disabled are on the committee. But don't let that camouflage the fact that this committee is packed with those who have the most to gain or lose when highway construction is completed.

Are these representatives of some of the nation's most technologically forward thinking companies evil? No. Do they have their own company's interests at heart, and do they seek to protect those interests? No question about it.

But who is going to speak for you? Who will remind the government at every turn that it should get out of the business of regulating speech—that to do so is a violation of our Constitution? Who will focus the committee and ultimately the federal government on the real communications issues of the '90s, namely getting the federal government out of the business of censoring content and into the business of guaranteeing access for all citizens, including you, the future producers of television, to the information highway?

If these issues go ignored and the committee turns into nothing more than an industry lobby that divides up the pie, it's almost certain that you and I will find that the information superhighway won't take us where we need to go.

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8. Personal TBC IV
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11. Vista Pro 3.0
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15. Personal Component Adapter
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East

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Bill Sharer
6629 Paxton Rd.
Rockville, MD 20852-3659
Voice/Fax (301) 230-2847
BIX: bsharer
Compuserve: 76426,112

The Amiga Video Graphic Society
Roger L. Elowitz
32 Duncan Dr.
Morganville, NJ 07751-1649
(908) 536-4786
Meets on the second Friday of the month
7:30 p.m.

Pittsburgh Commodore Group No. 346
Robert W. Peach
P.O. Box 16126
Pittsburgh, PA 15242
BBS: (412) 396-5483
Meets on the third Sunday of each month at Duquesne University's Mellon Hall (except July and August)

Amuse
151 First Ave., Ste. 182
New York, NY 10003
(212) 460-8067
Fax(212) 290-6747
BBS (718) 539-3338
Meets on the first Tuesday and third Thursday of the month at
Time Share Studios,
140 W. 24th St.
7:30 p.m.

Fine Art Productions User Group Society Network
Richie Suraci
Fine Art Production
67 Maple St.
Newburgh, NY 12550
Voice/Fax (914) 561-5866
Flexible meeting times, call for information

MicroWave User Group
Art Baldwin
3670 Delaware Ave.
Buffalo, NY 14217
(716) 873-1856
BBS: (716) 873-9262
Meets on the first Tuesday of the month
7:00-9:00 p.m.

Suffolk Video Club
Attn: William Pinto
15 Columbus Ave.
Brentwood, NY 11717-2506
(516) 273-4876
Meets on the second and fourth Thursday of the month (except July and August)

Toasterholics Anonymous
Armato's Pro Video
Seth Grief
6716 Myrtle Ave.
Glendale, NY 11385
(718) 628-6800
Meets on the second Thursday of the month
7:00 p.m.

Vision VT Users Group
Vision Commuications Interactive
Sam Young
4000 Piedmont Pkwy., Ste. 131
High Point, NC 27265
(910) 841-6988
Meets every six to eight weeks for five hours on Saturday mornings.

VA Toaster Users Group
Tidewater (Norfolk, Virginia Beach, Hampton)
George Triolet
902 Tabb Lakes Dr.
Yorktown, VA 23693
(804) 867-9056
Meets the first and third Wednesdays of the month
7 p.m.

WV Video Toaster Users Group
Destiny Images
Jamie Cope
PO Box 4631
Charleston, WV 25364
(304) 925-4741
Meets on the second Tuesday of the month at Computers Plus in S. Charleston
7:00 p.m.

South

A-TUG Border States Amiga Group
Micro-Tronix
1614 Towson Ave.
Fort Smith, AR 72901
(501) 782-4048
Meets on the second Saturday of the month
9:00 a.m.

Arkansas Toaster Users Group
David Settlemoir
AG&FC Video Productions
2 Natural Resources Dr.
Little Rock, AR 72205
(501) 223-6352
BBS: (501) 223-2516
Meets on the second Thursday of the month
6:00 p.m.

West Tennessee Video Toaster Users Group
Brian Churchill
8886 Davies Plantation
Memphis, TN 38133
(901) 385-1711
Meets on the third Tuesday of the month at the Main Library at 1850 Peabody
7:00 -9:00 p.m.

Club Toaster
St.Petersburg/Clearwater Tampa
Larry Bragg
9125 U.S. 19 North
Pinellas Park, FL 34666
(813) 576-5242
BBS: 813-527-1722
Meets on the last Thursday of the month
7:00 p.m.

Toast 'n Jam
Debby Willis
Computers Plus
1808 W. Int'l Speedway Blvd. #304
Daytona Beach, FL 32114
(904) 252-6442
Meets on the second Tuesday of the month
7:30 p.m.

VLS Graphics Users
1533 Lakewood Rd.
Jacksonville, FL 32207
(904) 396-0746
9600 V.42.bis
6p-9a M-TH, 6p,F-9a,M
Meets on BBS
(904) 396-0318

Southwest Florida Toaster Users Group
Jim Franke
944 Country Club Blvd.
Cape Coral, FL 33990
(813) 574- 8999
Fax (813) 574-8999
Meeting times vary. Call for information.

Midwest

Channel Z Toaster User Forum
Brian Plante
492 Sheridan Rd.
Evanston, IL 60202
(708) 332-1710

Discover-*Ring* Video Toaster
Ring Software
726 E. State St.
Geneva, IL 60124
(708) 232-0009

Digital Arts Toaster User Forum
122 W. 6th St.
Bloomington, IN 47404
(812) 330-0124
Meets the last Wednesday of the month
7:00 p.m.

Toast of Tulsa
Stewart Gus
Computer Consultants, Inc
P.O. Box 691810
Tulsa, OK 74169
(800) TOAST-OK
Meets the second Saturday of the month at 2:30 p.m. at Hardesty S. Regional Library, 6737 S. 85th E. Ave.

TUGSM
Toaster Users Group of Southeastern Michigan
Michael A. Greer
25109 Greenbrooke Park Dr.
Southfield, MI 48034
(313) 355-5916

Mid-West ToastMeisters
Great Plains Motion Picture Company
Brent Malnack
11011 Q St.Studio 105 C
Omaha, NE 68137
(402) 339-1001

West

Inland Empire Toaster Users
Neil Abeynayake
1033 Pacific St.
San Bernardino, CA 92404
(909) 885-5259
Meets on the first Thursday of the month
6:30-9:30 p.m.

LA Video Toaster Group
Mark Stross
10330 La Tuna Canyon Rd.
Sun Valley, CA 91352
(213) 259-9033
Meets on the first Sunday of the month at CBS Television City
1:00-5:00 p.m.

Orange County Toaster Users Group
Bruce Gleason
Thumbs Up Video
1206 W. Collins
Orange, CA 92667
(614) 633-3629
Meets on the third Thursday of the month
6:30 p.m.

Sacramento Video Toaster Society
Glen Cornish
Applied Computer Systems
6108 Watt Ave.
North Highlands, CA 95660
(916) 692-0520
(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
2334 Galahad Rd.
San Diego, CA 92123
(619) 277-5699

Silicon Valley VTU Group
HT Electronics
Andrew Timmons
2427 Hart Ave.
Santa Clara, CA 95050
(408) 243-9233
Meets on the last Thursday of the month at
HT Electronics, 275 N. Mathilda Ave., Sunnyvale, CA
7:00 p.m.

Amiga LightWave User Group
MG Software & Video
Mark Miller
6660 Reservoir Ln.
San Diego, CA 92115
(619) 463-0545
Flexible meeting times, call for information

N.A.G. Desktop Video SIG
Scott Wehba
Infinite Solutions
14780 SW Osprey Dr., Suite 240
Beaverton, OR 97007
(503) 641-2734
Meets on the fourth Thursday of the month
7:00 p.m.

Amiga Video Association, Inc.
Forrest McKinney
PO Box 550248
Dallas, TX 75355-0248
(214) 826-5113

Professional Video Toaster Forum
Omni International Trading
Monte Strohl
316 Westlake Ave. N.
Seattle, WA 98109
(206) 628-2923
Fax (206) 628-4324
Meets on the second Wednesday of the month
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
Anthony Alvaro
Castle Computer Systems
#200-4170 Still Creek Dr.
Burnaby, B.C. V5C 6C6
Canada
(604) 298-9866
Flexible meeting times, call for information

Toaster Professional Forum
Filmclips, Inc.
25C Mallard Rd.
Don Mills, Ontario M3B 1S4
Canada
(800) ON TOAST or (416) 441-1661
Flexible meeting times, call for information

Video Makers of Calgary
David Lundquist
The Computer Shop
3515 18 St. SW
Calgary, Alberta T2T 4T9
Canada
(403) 243-4356
Meets first Wednesday of the month
7:00 p.m.

Video Toaster User Group
Jean-Francois Boisclair
Maison du Logiciel
Softwarehouse
2466 Jean-Talon Est,
Montreal, Quebec H2E 1W2
Canada
(514) 374-3614
Fax (514) 722-0627
Meets on the last Tuesday of the month
7:00-10:00 p.m.

Far East

OvenRange
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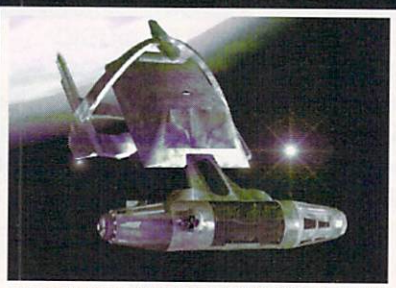

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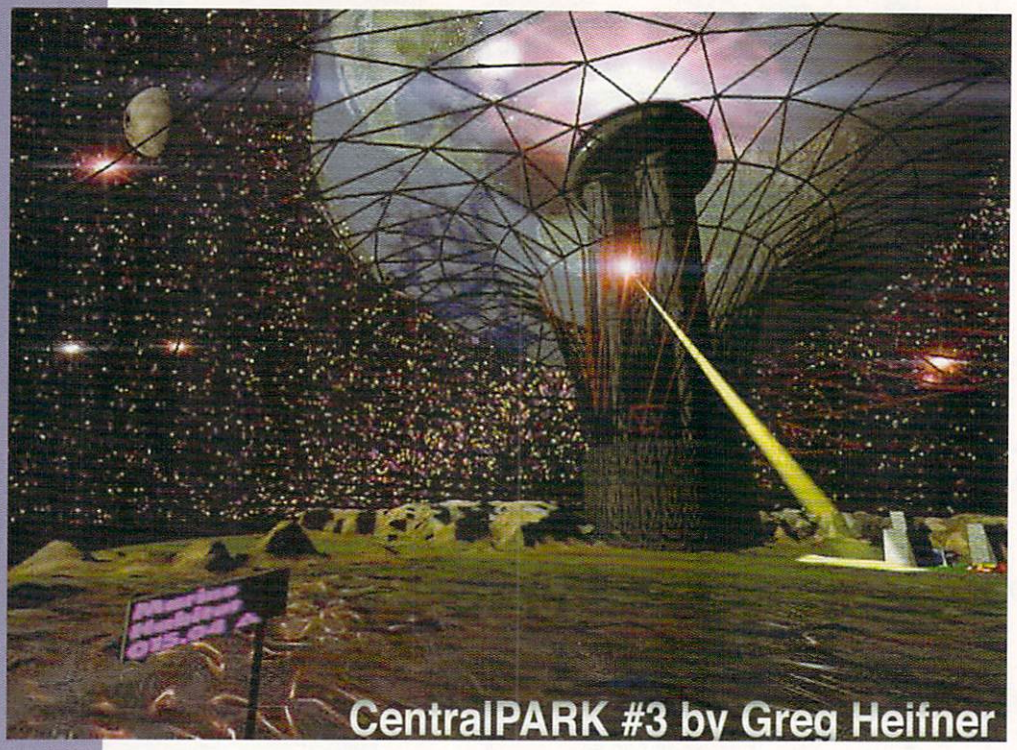

CentralPARK #3 by Greg Heifner

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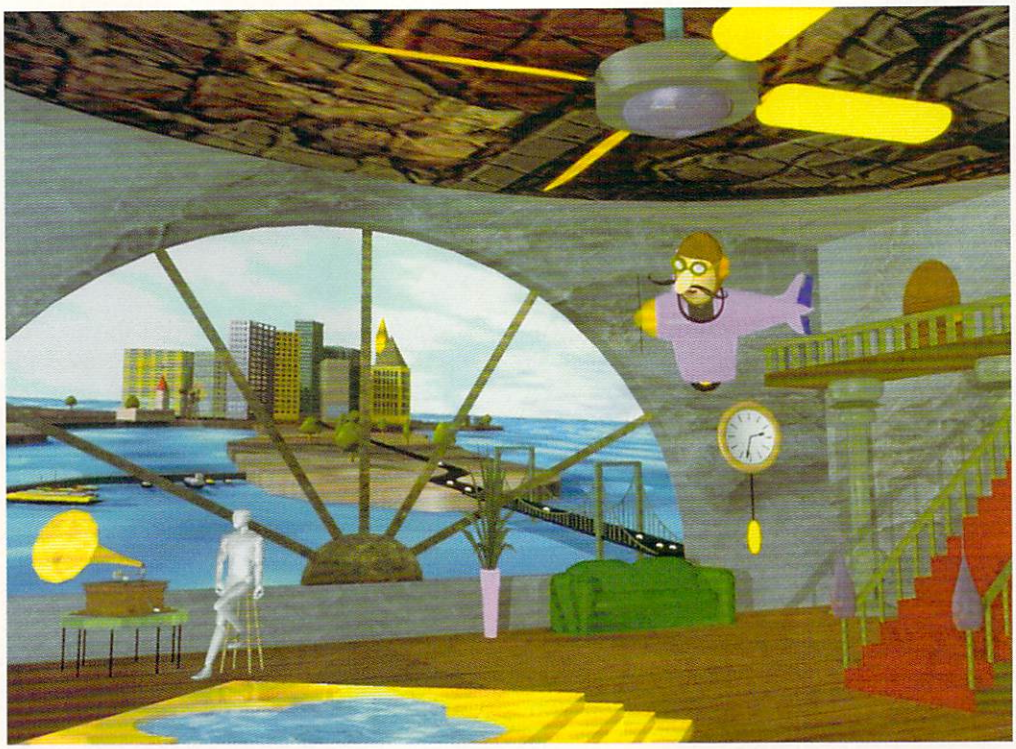
The LAIR by Greg Heifner

ATTACK
by Greg Heifner

Greg Heifner

These three images were created on an Amiga 4000 linked via ParNet to an Amiga 3000, an '040 18Mhz board and an '040 30Mhz board. Heifner used Fractal Paint for image painting and Adobe Photoshop for the texture maps.

Each frame in *CentralPark #3* was rendered in 30 minutes. It is made up of 80,000 polygons and about 50 texture maps. *The Lair*, composed of 25,000 polygons and 10 texture maps, was modeled in 15 hours and rendered in 40 minutes. *Attack* was modeled in 11 hours and rendered in two hours. Based in Columbia, Mo., Heifner runs Heifner Communications and can be reached at (314) 445-6163.



Yaron Zohar

The following three images were part of a 2.5-minute, ray-traced animation.

View From A Window (left) was completed with a single Amiga and Toaster 2000 and a '030 50Mhz board. Modeling was done in Imagine 2.0; Pixel 3D was used for converting the model from Imagine to the Toaster. Rendering time in print resolution was approximately 14 hours.

As part of the same animation, which was commissioned by Far West Productions, *Flying Little Man* was modeled over three days. Rendering in print resolution took approximately 25 hours.

Skyline was modeled in approximately three days. Rendering in print resolution took 45 hours because of ray tracing. All rendered files were transferred to D1.

Based in Los Angeles, Zohar can be reached at (310) 659-2054.

LAST WORD

Censorship American Style

Chipping Away at the Constitution

by Lee Stranahan

A lot of people seem to worry about my 17-month-old son Shane. It's not who you might expect, either. Sure, Shane has the usual doting collection of grandparents, aunts, uncles, and others who care about him. But forget those peons—my son has people at the highest levels of government looking out for him.

Don't believe me? Just watch C-SPAN. Censorship is alive and well in America, all in the name of protecting our children. We've moved from Dan Quayle talking about Murphy Brown's parenting skills to calls for a reintroduction of the Fairness Doctrine.

There are also the ongoing calls for censorship being voiced in the halls of Congress. You can tell the Democrats are in the White House because the hearings are about TV violence. If a Republican administration were in power, the hearings would be about sex. Neither side is consistently in favor of freedom; they just differ sometimes about what's fair game to censor.

These hearings seemed to me to be a parliamentary version of the old good-cop-bad-cop routine. Senator Paul Simon (D-Ill.) played the good cop. He urged the networks to adopt voluntary standards... or else. Or else what? Or else, well, he might not be able to keep some of the other politicians calm. Enter the bad cops like Ernest "Fritz" Hollings, Janet "The Waco Kid" Reno and Ed "I Want The Airwaves" Markey.

Of course, good-cop-bad-cop is just a game. The good cop is an actor playing a role. In reality, he wants the same result as the bad cop and doesn't really care how he gets it. If need be, he'd just as soon trade roles. In the end, it's just manipulation.

The networks fell for it. They tripped over themselves trying to convince nice people like Simon and Markey that they'll set those standards right away and try to be good in the future.

If these spineless weasels were just speaking for themselves, I'd be tempted to say that they deserve what they'll get and good luck to them. Unfortunately, the networks are speaking for people like you and me who are the future of broadcasting.

The networks have no qualms about using the government to do their dirty work; if they are having trouble competing against cable, well, let's regulate cable, by gum. The cable industry doesn't have more strict moral standards. The phone companies seem to be a threat—let's get 'em! The phone companies need to compete with the networks, so sick 'em boys!

This is dog eat dog, but it sure isn't capitalism.

There's one other interesting thing about Hollywood's reaction. When former Vice President Dan Quayle made his comments about family values, he didn't threaten the TV industry at all. His point didn't seem to advocate legislation, but to call attention to what he viewed as a bad message. Whether you agree with him or not, you will remember that the entertainment community threw a mental fit. Quayle was ridiculed even more than usual.

However, when members of the Clinton gang explicitly threaten the industry with government intervention, there's total silence. Think there might be some bias there?

You might think I'd be happy about all the attention the government's showing toward my son, but I'm not. Sterling examples of humanity that they might be, I don't want Ted Kennedy or Bob Packwood raising my kids, thank you very much.

Do I worry about my son? You're darned right I do, and my biggest worry is that he's growing up in an America that's continuing on its slow morph into a police state. The Constitution, this nation's foundation that has been strong enough to last us more than 200 years, is being chipped away.

We've been trading in the Bill of Rights for the government's promise of protection. If we trade in the First Amendment, the government will protect us from ideas we don't like. If we trade in the Second Amendment, they'll protect us from violent crimes. If we trade in the Fourth and Eighth Amendments, they'll protect us from drug dealers. Still not safe? That's OK, we still have a few amendments left.

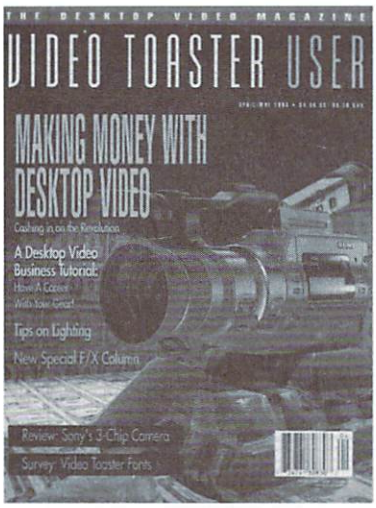
It's a sucker's deal. They don't want you to remember this, but the Bill of Rights wasn't added to the Constitution to protect us from each other, but from a much bigger threat to individual liberty. The Bill of Rights exists to protect us from the state. After we've traded in all of our rights to the government, who will protect us from the government?

Forget Beavis and Butt-head. This is the real threat to our kids. You can do something about it, too. Don't join the game that the government is playing. They'll try to sell you, too. "You want cheaper cable? We'll just pass a law. Don't worry about the cable companies: This benefits you! To hell with them. By the way, how about free health care while we are at it?"

You can't get something for nothing. Don't expect to take away somebody else's right to live their life as they choose and not lose your freedoms as well. Don't fall into the same traps as the networks, cable companies and other telecommunications giants. The vicious cycle has to end someplace. Let it be with you.

VTU

Lee Stranahan is currently on the road with the VTU-*sponsored Toaster Training Seminars. For information about a seminar near you, call (800) 322-2843.*



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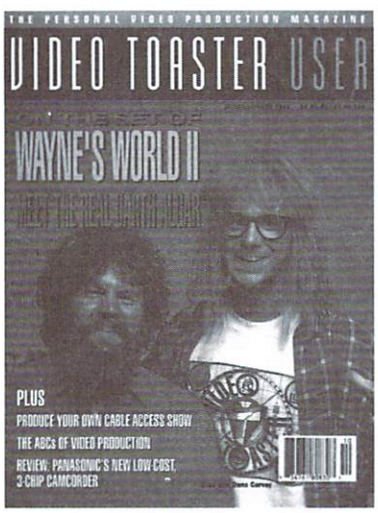

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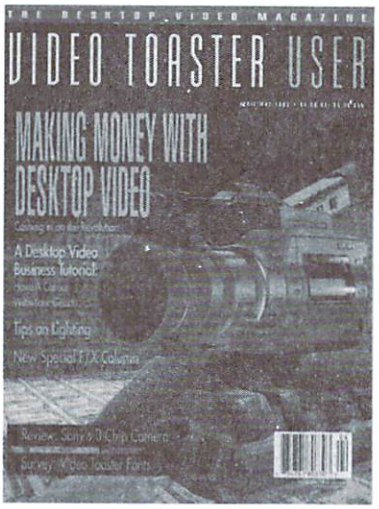

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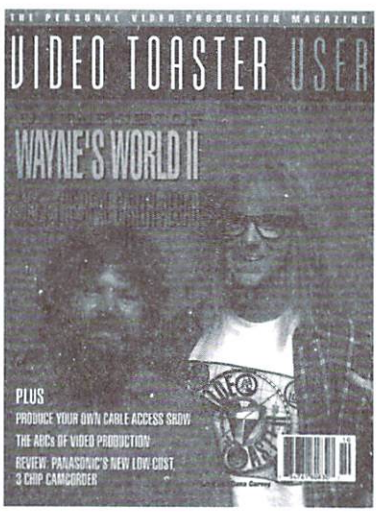

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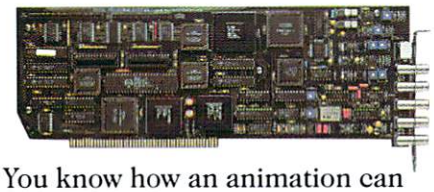

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