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an audio publications magazine

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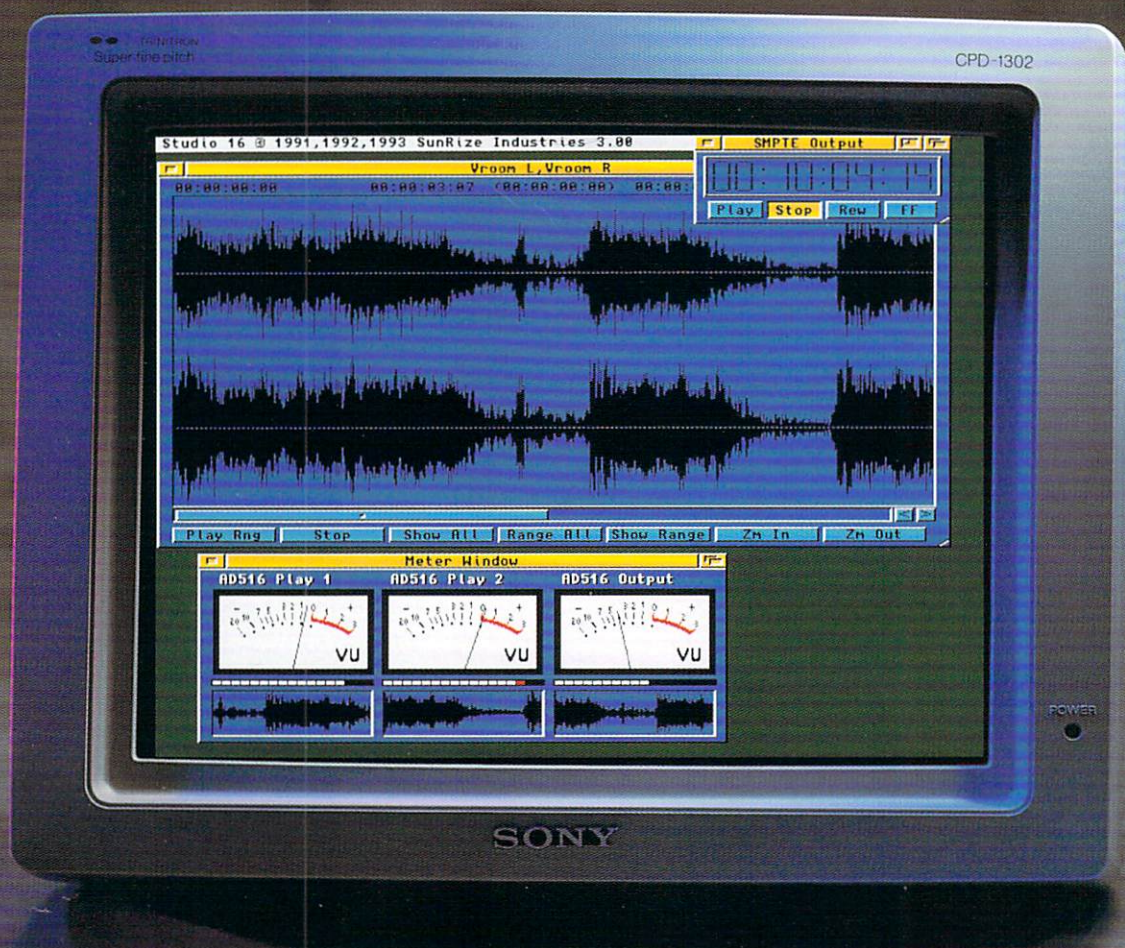
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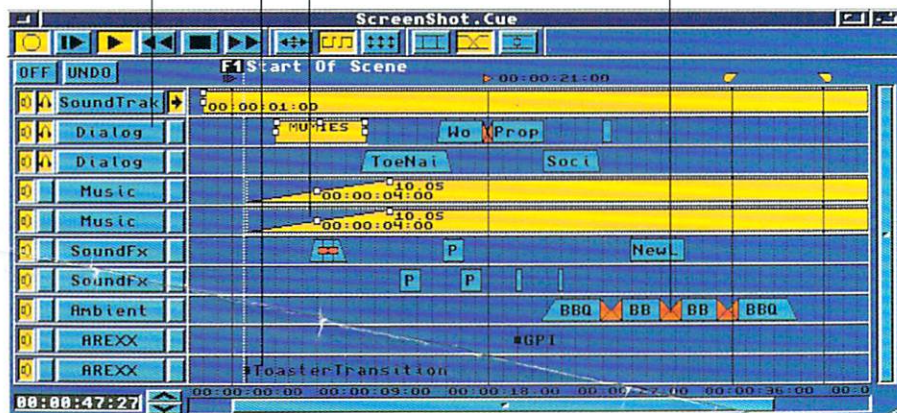
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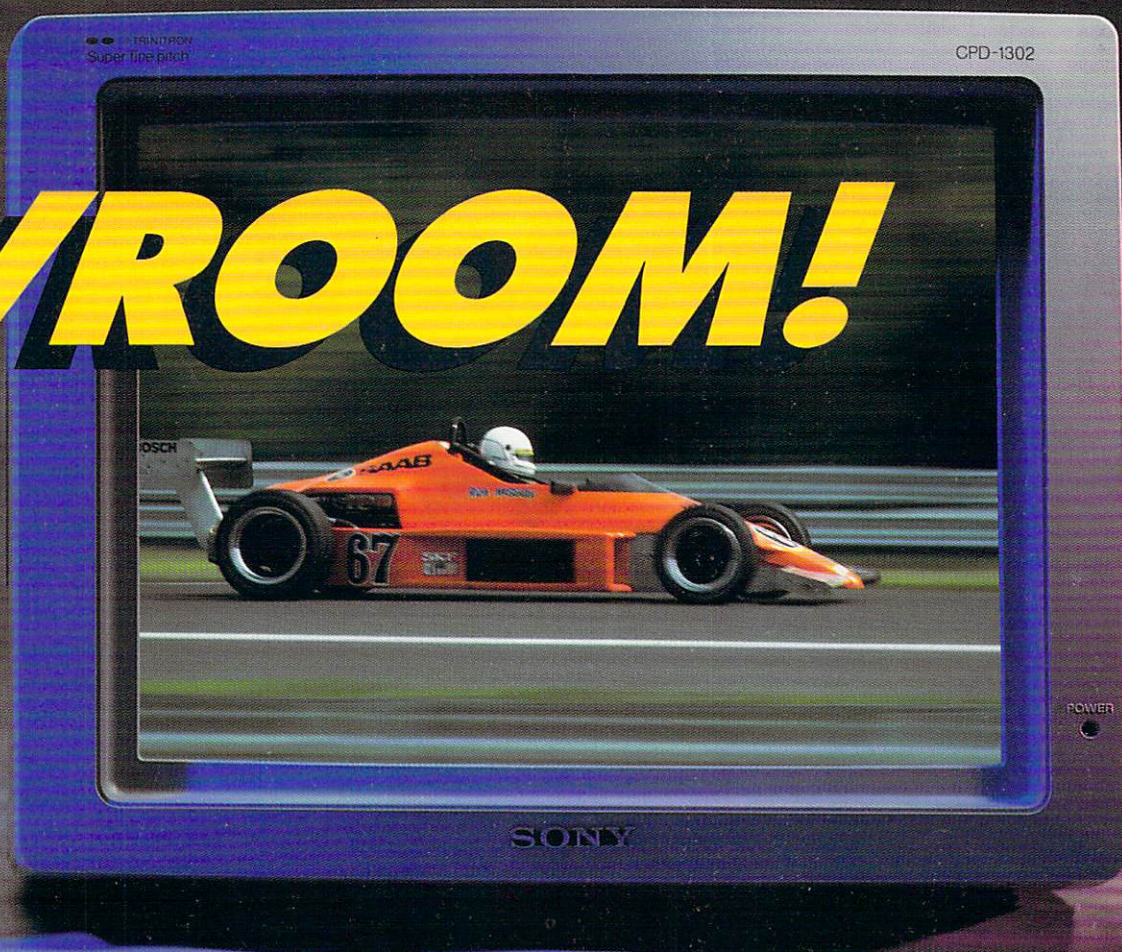
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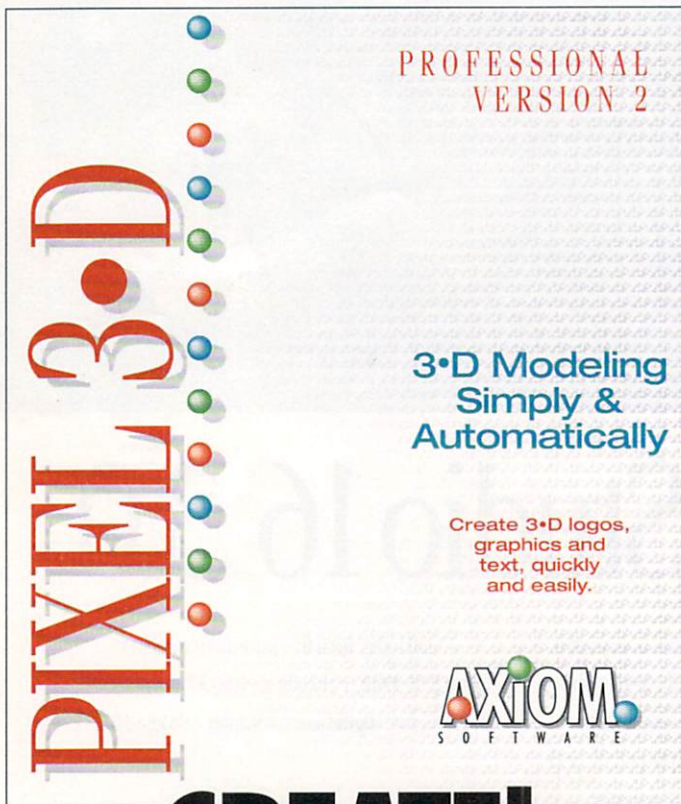


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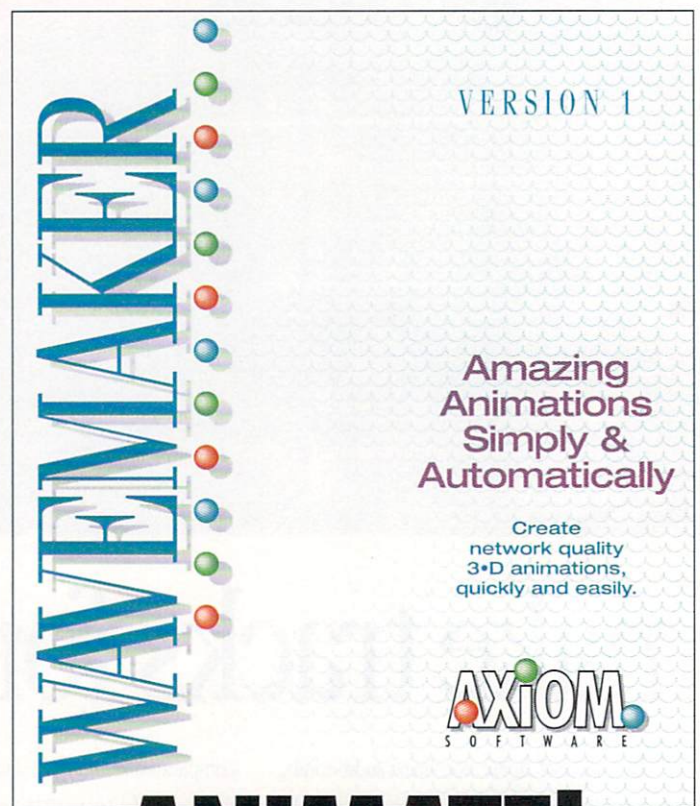
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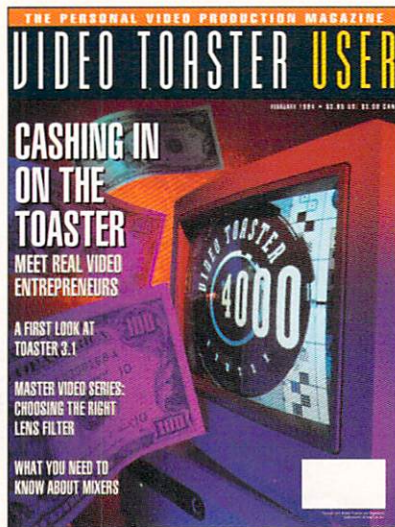


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VIDEO TOASTER USER

FEBRUARY 1994 ISSUE NUMBER 16



Cover photography by: Mark McCabe

FEATURES

72 OFF THE WALL IMAGES: TELEVISION PROJECTORS

by Peter Utz

The *Saturday Night Fever* age may have thrived on strobe lights and disco balls, but in the '90s, television projectors and Video Toasters have changed the rules of the game.



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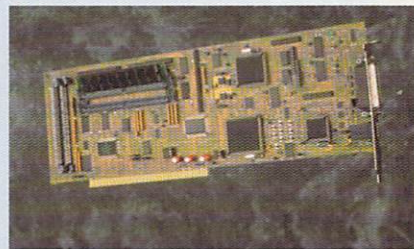
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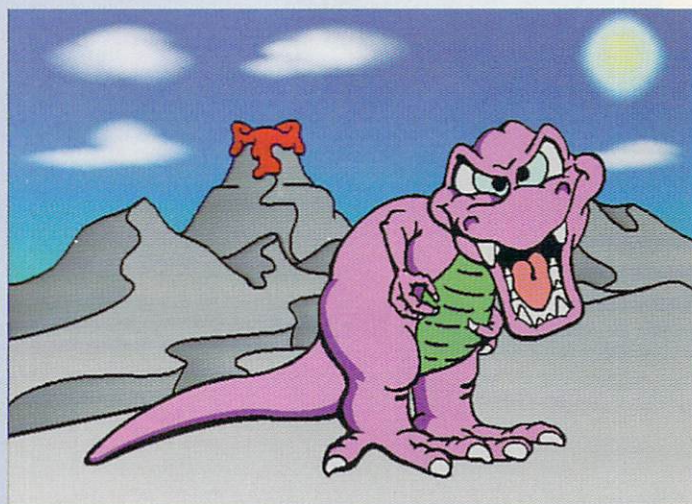


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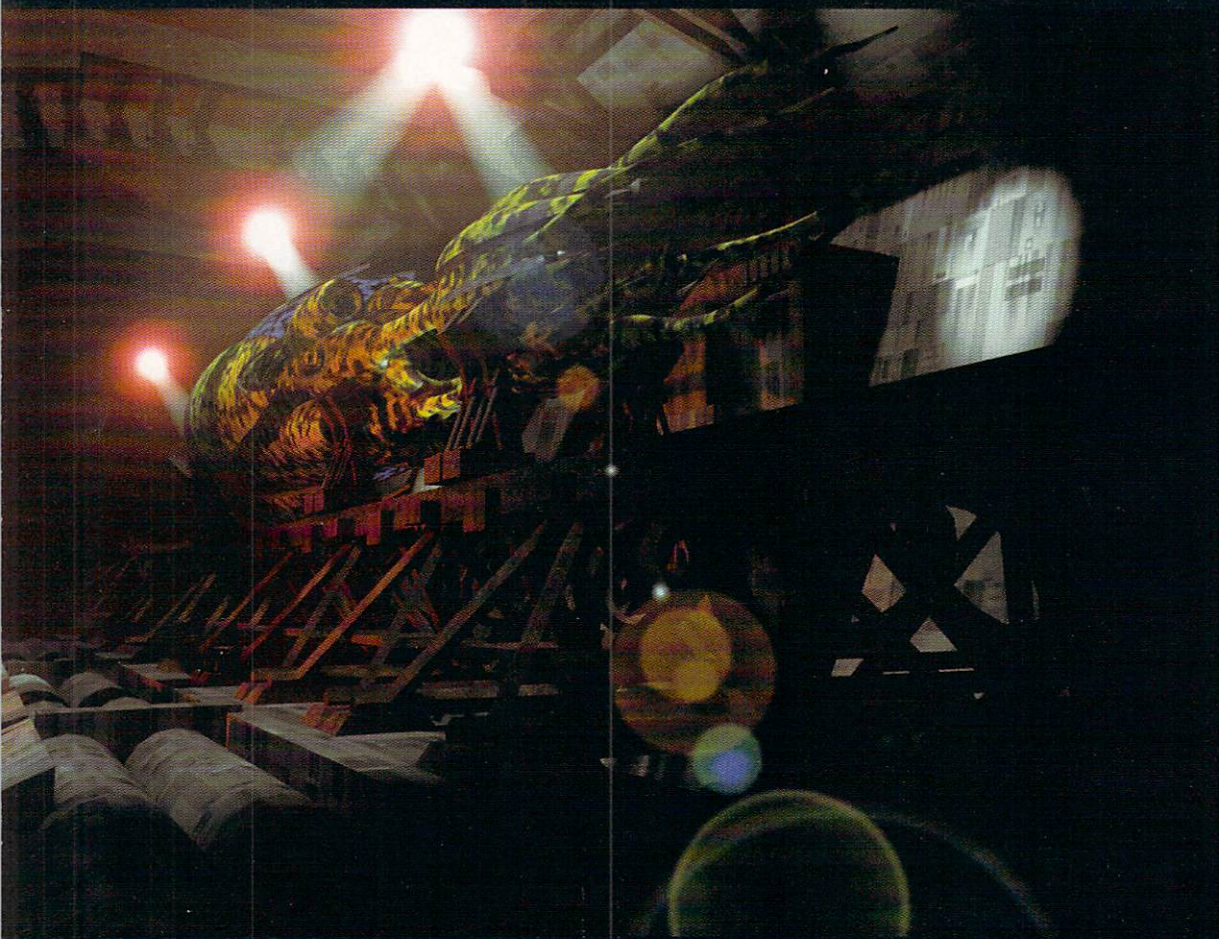
2D CEL ANIMATION

by Maury McCoy
An introduction to 2D cel animation



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Next year Babylon 5 will be a TV series...

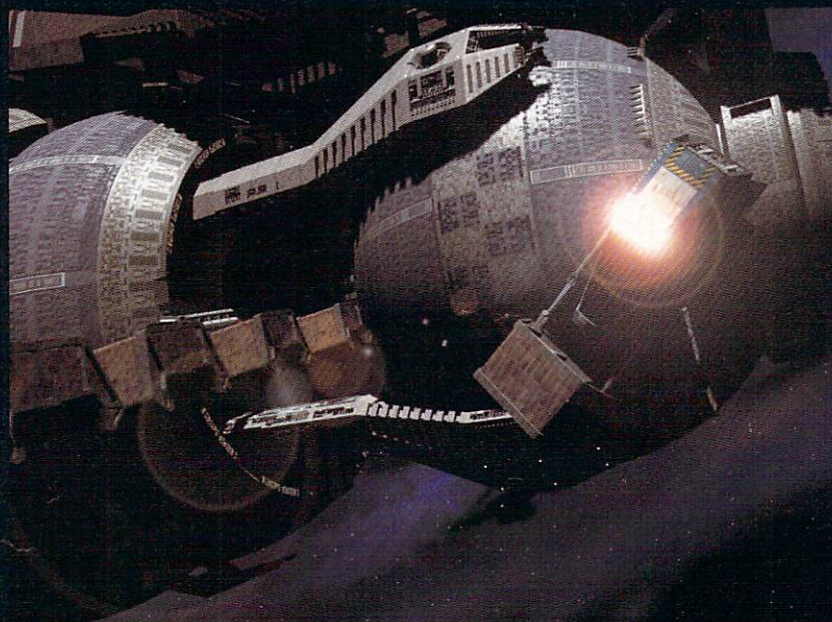


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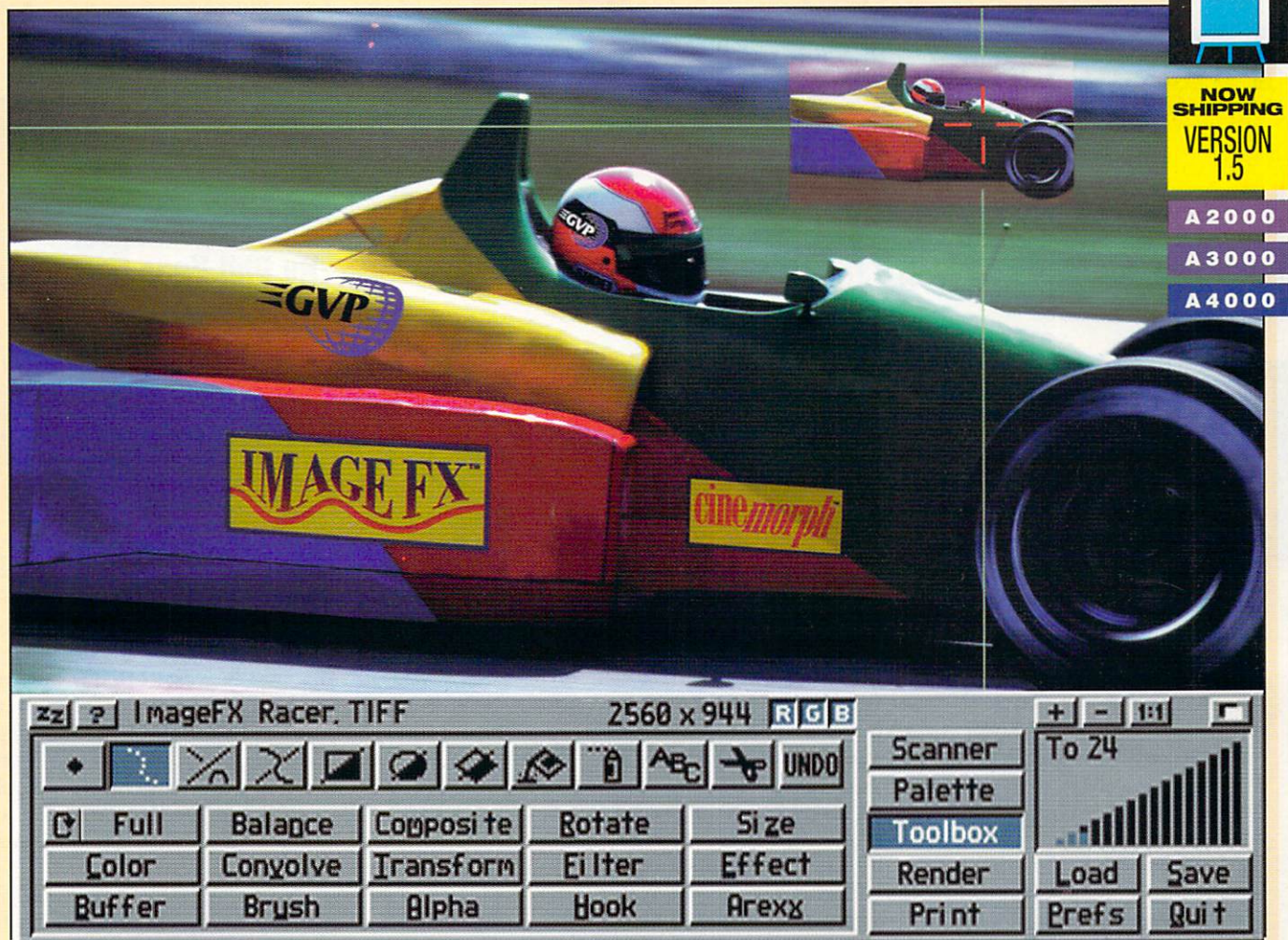
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TOASTER TALK

Videotape Is Dead

Editors Look toward Non-Linear Nirvana

By Phil Kurz



Makers of videotape machines have a lot to be worried about these days. In the vast consumer electronics market, sales of VCRs are down, new media like CD-ROM are emerging and a nascent video distribution system—competitive direct broadcast satellite service—will soon emerge. Each in different ways threatens to knock out the foundation upon which the success of the VCR has been built: People like to watch the movies of their choice in the privacy of their homes. Until now, the only game in town has been the movie rental shop and the home VCR.

Things aren't much better for VCR purveyors in the professional market. I recently led a roundtable discussion about the future of video editing with a half dozen editors working in San Francisco.

We talked for nearly two hours about how they do their jobs today and how they expect to work in the next few years. While they differed on the specifics in subtle ways, they all agreed that the sooner videotape was dead in the post-production process, the better their lives would be.

They hate videotape and loathe the endless details they must see to when they edit with the stuff. They can't wait for it to be hoisted into some museum where wide-eyed students will marvel at how a multi-billion dollar industry could rely upon the shiny black linear demon. They'll dance on its grave the day that it dies and throw a week-long bacchanal to celebrate.

Simply put, they hate tape because digital, random-access media has spoiled them. In the driftless, ever-flexible world of digital media, the editor is insulated from the analog drudgery of system timing and the endless cycle of play, pre-roll, record and search. Each of these editors worked on non-linear editing systems, such as those from Avid and ImMIX.

The consensus of the group was clear: It's only a matter of time until affordable, on-line quality random access media replace tape forever in post-production. That's pretty strong stuff from a group of people who up until recently had all but been told outright that they'd better take what they were given and like it.

The Great Assumption

The entire discussion was based upon one gigantic assumption: On-line video quality will soon be available from a non-linear, digital storage media.

To accept that as a given demonstrates the speed at which progress in the data compression of digital video is moving. Only two years ago, such compression was only dreamed about.

It was almost impossible then to imagine how 27

MB of digital video information per second could be compressed enough, so that an adequate amount of source video could be stored, edited and played back at a quality level suitable for finished work. The more video was compressed, the common wisdom held, the worse the playback would look.

Rather than get bogged down in the technical concerns of how such compression would happen, each member of the group identified the interface of the non-linear editing system as the single most important component of the system.

They believed that the interfaces of today's systems, while good first attempts, were lacking in critical areas. First, the interface gave them no control of the digital video that would mimic the proc amp controls of a time base corrector. This problem was particularly troublesome to editors who worked in facilities that left the digitizing and compressing to a faceless technician on the night shift.

Second, they agreed that the interface must be picture-icon (or picon) based. Finally, they want to tap into real-time effects and switcher transitions through their interface.

What That Means to You

This might all seem academic to Toaster users who can't conceive of this sort of technology in their future. My question is, why not?

Given the unprecedented development of third-party hardware and software peripherals for the emerging Video Toaster market, how long can it be before some company conceives of and delivers a non-linear editing solution for the Toaster?

Such a system would unlock Toaster users from the same analog chains that bind the rest of the video industry. With random access, Toaster users would find the editing process much easier and quicker. That in turn would make them more productive and in all likelihood improve the quality of their finished product. If their experience paralleled that of today's users of non-linear editing systems, they would be able to complete a project four to 10 times faster than is possible with tape. That means there's more than enough time to go back and cut new versions of a program until just the right one is created.

Even if such a system never comes to fruition for the Toaster, the effect of non-linear, on-line editing on the post-production industry should be a boon to Toaster users. After all, you might find some deals on used D2 machines at Big Bob's Bargain Basement Video.

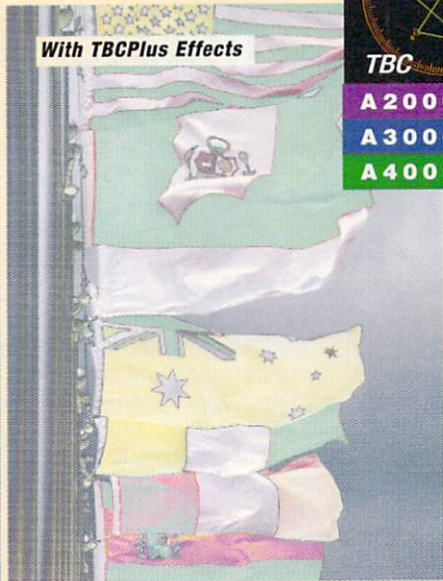
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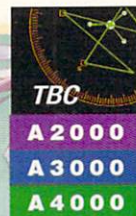
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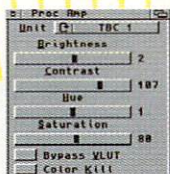
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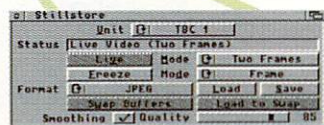
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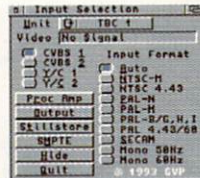
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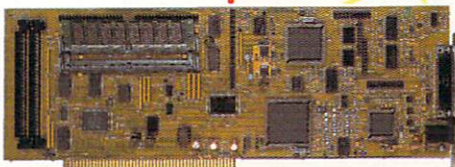
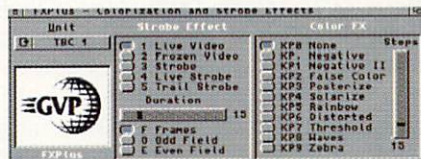
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All this from the voice of experience, Brent Malnack, former NewTek™ LightWave™ product manager and AV Video Toast Production columnist.

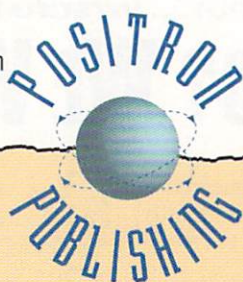
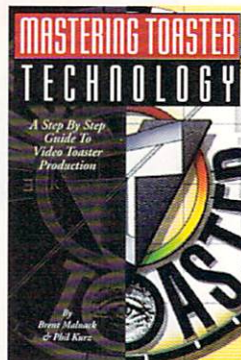
Now includes Toaster™ 4000 coverage

We've gone into our second printing of **Mastering Toaster Technology**, and with this edition we are offering two supplemental tutorials specifically tailored for Toaster 4000 users. Learn how to master the alpha channel with LightWave™, ToasterPaint™ and Toaster CG™. You'll also discover how to rotoscope animations from RAM.

Bonus Software

In addition to this insightful 250-page book and the supplemental tutorials on the Toaster™ 4000, you will receive a two-disk set crammed full of software goodies, including 3-D objects, a beveled font set, a color font set, anim wipes and clip art.

Priced at \$49.95 (plus \$5.00 for shipping and handling), **Mastering Toaster Technology** is a steal. Join the thousands who have already purchased a copy of **Mastering Toaster Technology** and begin your journey to mastery of the Video Toaster™.



New From
Positron
Publishing!

Mastering Television Technology.

A Cure for the Common Video®

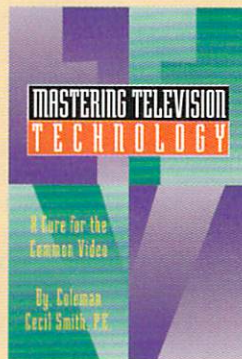
Ever wonder what subcarrier-to-horizontal phase is all about? Scratch your head when it comes to interpreting vectorscope and waveform monitor displays? Do you know what a TBC does but aren't sure about all of the proc amp controls?

In **Mastering Television Technology, A Cure for the Common Video**, author Coleman Cecil Smith explains audio and video concepts in a way that's easy for both seasoned video professionals and video newcomers to understand. Smith, a noted engineer, author and instructor has taught these principles to thousands of students in classrooms across the country. Now he can teach them to you in the privacy and comfort of your home or office.

In this 388 page illustrated handbook, you'll learn:

- The basics of video, including approaches to lighting, pickup tubes and CCDs, and camera operating controls.
- The basics of audio, including mic pickups patterns, audio mixing and equalizing and how to interconnect audio equipment.

- The basics of recorders, including various video recording methods and the proper way to make dubs.
- Concepts about the video signal, including sync signals, subcarrier-to-horizontal phase and how to read and use waveform monitors and vectorscopes.
- The basics of television systems, including keying, vertical interval switching, digital effects, and much more.



Whether you are a Video Toaster™ owner who wants to broaden your knowledge of video or you come from the more traditional video environment, you'll find the information in **Mastering Television Technology** to be invaluable.

Priced at \$49.95 (plus \$5.00 for shipping and handling), **Mastering Television Technology** is a bargain that no video professional can afford to be without.

SPECIAL OFFER: SAVE 10% ON BOTH

Circle Reader Service No. 141

CALL 1-800-365-1002 TO ORDER!

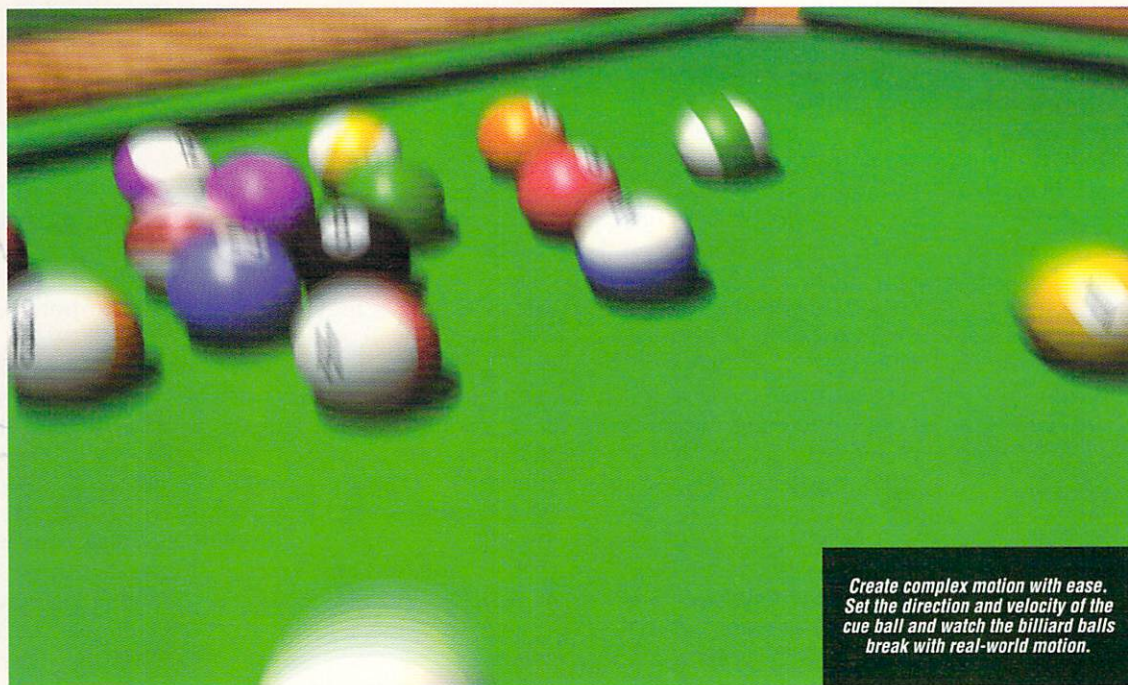
Order both **Mastering Toaster Technology** and **Mastering Television Technology, A Cure for the Common Video**, a \$100 value for \$89.95 (plus \$5.00 for shipping and handling), a 10% savings.

Additional Shipping/Ordering information: PO's (net 30) and checks mail to: Positron Publishing, 1915 N. 121st St., Suite D, Omaha, NE 68154. Non-U.S. orders: \$10 shipping & handling, mailed 1st class. Sorry, no C.O.D. orders. VISA and MasterCard orders accepted.

INTRODUCING DYNAMIC MOTION MODULE™

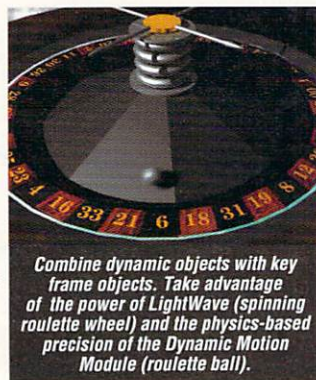
THE EASIEST, MOST ACCURATE WAY TO ANIMATE WITH LIGHTWAVE 3D™

Special
Introductory
Price: \$99.95*
Coming Soon
For Autodesk
3D Studio™



Create complex motion with ease. Set the direction and velocity of the cue ball and watch the billiard balls break with real-world motion.

Make your LightWave 3D™ animations as realistic as the world around you and eliminate the complexity of animating at the same time. Positron's Dynamic Motion Module for LightWave 3D lets both animation novices and experienced animators rely upon the laws of physics and the computing power of the Amiga to automatically define and create real-world motion and object interaction in LightWave animations.



Combine dynamic objects with key frame objects. Take advantage of the power of LightWave (spinning roulette wheel) and the physics-based precision of the Dynamic Motion Module (roulette ball).

Working with the Dynamic Motion Module is as simple as telling the program how much an object weighs, how fast it's moving and its direction of travel. Then sit back and let the computer define the motion and interaction of the objects in the scene. When it's finished, the Dynamic Motion Module delivers a wireframe rendering of all object motion in a LightWave animation.

Don't like the motion or object interaction? Simply preview a wireframe of the scene, change the settings for mass, velocity or direction of travel and try again.

The Dynamic Motion Module also takes the drudgery out of creating key frames in LightWave by doing so automatically, and because the program relies upon the laws of physics, the motion it creates is more precise

than any series of key frames that could be created by hand. Best of all, the Dynamic Motion Module lets you combine objects that have been assigned dynamic motion with other objects that rely upon key frame motion.

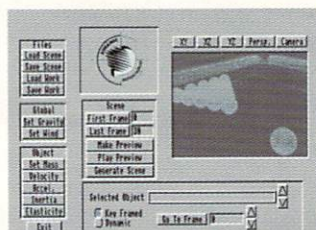
The Dynamic Motion Module for LightWave is perfect for all animation tasks and is particularly well-suited for accident reconstruction, a burgeoning market for LightWave animators.



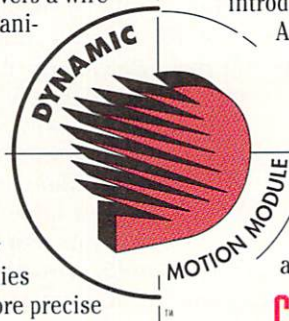
Open up new markets. With the Dynamic Motion Module, you can create accident reconstruction animations based upon conditions (mass, velocity and direction) found in the real-world.

The Dynamic Motion Module would be a bargain at any price, but for a limited time, Positron will offer the program for a special introductory price of \$99.95.

At such a low price, the Dynamic Motion Module should pay for itself right out of the box. Don't wait, take advantage of the low introductory price and order today!



It's easy to use. Simply assign the mass, velocity and direction values for dynamic objects and let the Dynamic Motion Module do the rest.



CALL 1-800-365-1002 TO ORDER!

SPECIAL INTRODUCTORY OFFER:

Circle Reader Service No. 141

*Order the Dynamic Motion Module for LightWave 3D by Nov. 15, 1993 to take advantage of our introductory price of \$99.95 — a \$40 savings off list price. In the United States, add \$5 for shipping and handling. Outside of the country add \$10, mailed first class.

Additional Shipping/Ordering information:
Send purchase orders (net 30) and checks to:
Positron Publishing, 1915 N. 121st St., Ste. D,
Omaha, NE 68154. Sorry, no C.O.D. orders. VISA
and MasterCard orders accepted.



LETTERS TO THE EDITOR

Corrections:

Dear VTU:

Can you tell me why there aren't any job opportunities for LightWave modelers/animators? I've been studying and doing this for 18 months and have not found one.

I got into this because: 1) I love it! 2) I wanted a career change, and I'm good.

Please explain. I also subscribe to *Shoot*, and there's never any talk about LightWave, just the Harry. Thank you.

Sincerely,
Richard Sandoval

Editor responds:

Before you conclude that there aren't any job opportunities, I suggest you reevaluate what you are seeking. Do you really want a *job*, or do you wish to offer a service? I suggest you consider the latter. Not only are you likely to make more money, but the personal satisfaction you'll find in running your own shop will probably make it far more rewarding.

Dear VTU:

I bought your October/November 1993 issue. On the cover it says "Produce Your Own Cable Access Show," but there's no such article in the magazine. What gives? Mark Adams

Editor responds:

Perhaps you missed the sidebar on page 69, "Real-World Wayne and Garths."

Dear VTU:

I'm on a journey to a new adventure with my first issue of *VTU*. On that premise it has been quite a challenge to fathom all the information taken in. But I am determined.

These are general comments on *VTU* from a new

reader and one just beginning to learn about personal video production.

I enjoyed the article about Tim Jenison and Paul Montgomery, who seem to be quality people with quality ideas, making quality products. Your report from SIGGRAPH explaining the introduction of the Screamer by NewTek was great. Wil Wheaton's article was totally cool—he seems unconventional and committed to "defying the laws of tradition!"

I didn't know the Toaster or *VTU* existed until Oct. 17, 1993, when I attended a convention in Kansas City, Mo., with Wil Wheaton as a special guest. After listening to Wil for some time, it was apparent that he is a very capable and, yes again, committed individual. I not only left the convention that day enlightened but actually excited about what I had heard.

I wanted to know more!

I remembered Wil's comments on an article he was writing for *VTU* and immediately went searching for my first issue. Needless to say I am not disappointed.

Enclosed is my subscription order. I am looking forward to your monthly issues. Well done.

Thanks to *VTU*, NewTek, and a special thanks to Wil Wheaton for introducing me to a new personal frontier.

Later,
Joe Choat
Kansas City, Kan.

Dear VTU:

Your magazine is definitely the best! I like it better than all of the other "general" magazines. One would think that being a Video Toaster magazine, you would solely concentrate on video, but

you have a wide assortment of topics that are either directly or indirectly related to video, but that can still be used by people who aren't into video. Did I say video a lot?

What I would like to see is how a setup for the new Silicon Graphics Indy would compare to the Toaster. I was reading *Desktop Video World* (your competitor, but not nearly as good as you guys), and it said for a system that you could really work with, (the Indy) would cost \$19,490!

For the same amount of money, I could buy the following equipment for street prices:

Amiga 4000/040
12 MB of RAM
1.37 GB SCSI-II
Video Toaster
Studio 16
DPS Personal TBC IV
DPS PAR with dedicated hard drive
1084 monitor
1942 MiniTower (for expansion slots)
Digital Broadcaster 32
A4091 with 64 MB RAM
Ethernet card with software

I would rather have that, eh? What a setup.

Why don't you do an article comparing the Toaster and the Indy. Focus specifically on how much capability a certain dollar amount will deliver on the two systems. Heck, throw in the Mac and PC. I know some people are saying that "Silicon Graphics is invading the desktop! What a great deal!"

Yeah, but it doesn't come with a hard drive or 24-bit color, not to mention that the software costs as much as the computer! This thing costs a fortune for a usable setup. Please dispel the myth that the Indy is a \$4,995 computer

• In *VTU's Guide to Personal Video Production*, we regret the omission of the following dealer:

State: New York
Amigo Business Computer
192 Laurel Road
E. Northport, NY 11731
(516) 757-7334
Fax (516) 757-7234

The editors wish to acknowledge that *Amigo Business Computer* did provide its dealer information for readers before deadline; however, due to a data entry error the information was not printed. Please see the advertisement for Amiga Business Computer in the Dealer section.

• The following listing provides correct information for a printed error in the *Guide to Personal Video Production*:

Page 29
Circuits & Software
(313) 851-3536

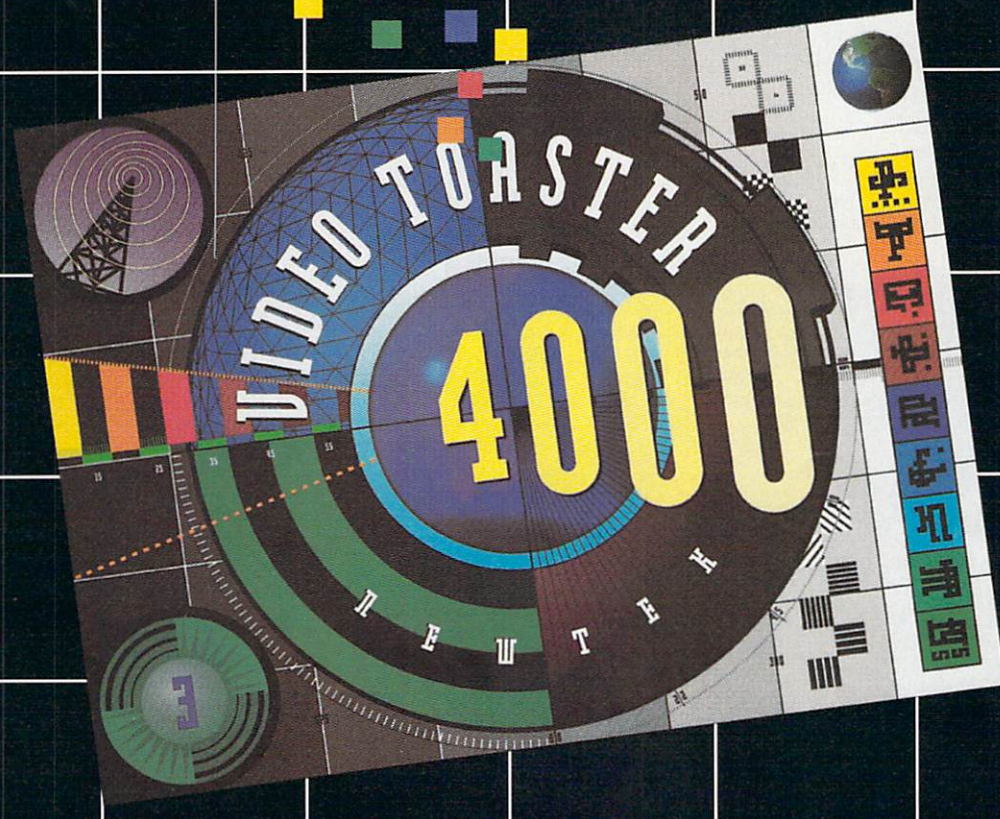
• In the January 1994 issue of *VTU*, "ToasterCG & Montage" page 76, the text describing "ToasterCG Disadvantages" and "Montage Disadvantages" was erroneously transposed. *VTU* regrets the error.

when in reality it is a \$15,000 computer. You don't have to do it, but it would be cool.

Josh Johnson
via Portal

Editor responds:

Thanks for taking the time to write. With a letter like that, I think you've thoroughly covered the topic.



¡Viaje a 4000 Km/h!

Centennial's Spanish Toaster workstations are now powered by NewTek's Toaster 4000 and Commodore's A4000. They include Spanish keyboards and fonts with optional Spanish manuals. Call Florida's number one Toaster dealer and Video Systems integrator for your ideal desktop video system. Latin American dealer inquiries welcomed.



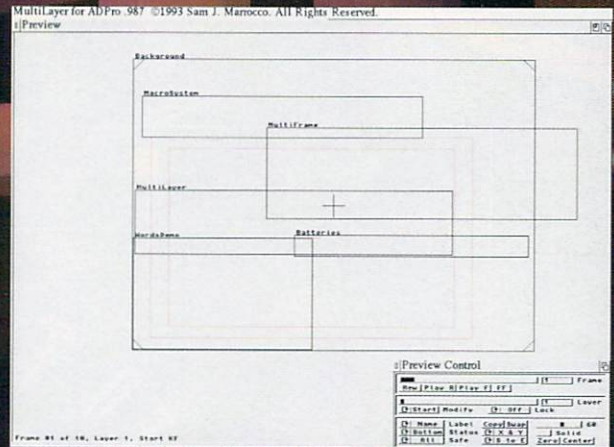
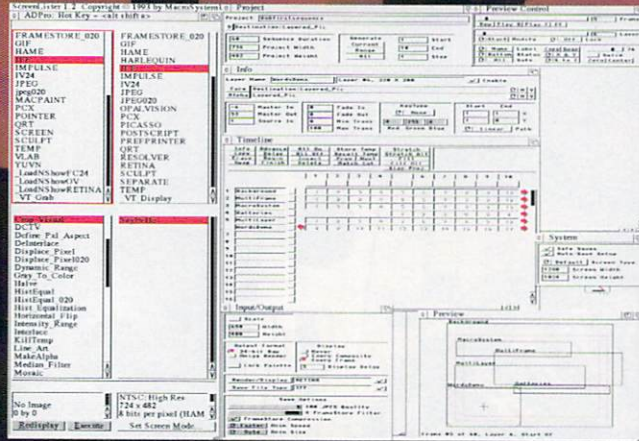
Circle Reader Service No. 107

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(305) 633-2200 • FAX: (305) 635-0030 Toll Free 1-800-422-2880 in Florida, Puerto Rico & U.S. Virgin Islands
2500 N.W. 39th STREET • MIAMI, FLORIDA 33142 U.S.A.

The Next Wave of Video Tools for your Toaster System

MultiLayer-ADPro - Digital Layering



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

Features include:

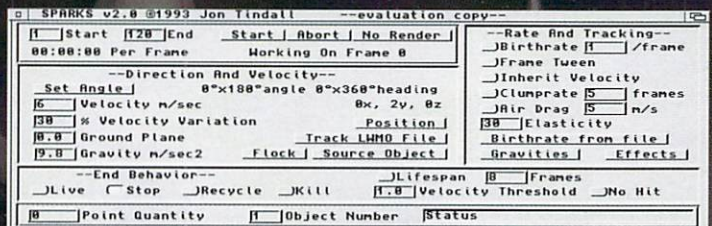
A Timeline interface that provides user-friendly control of all aspects of compositing and editing. A Preview interface that provides a real-time representation of all layers/images with positioning information and size. The preview can be animated and modified with a VCR-style interface. Image

representations can be dragged and positioned quickly and easily. Several types of Compositing/Digital Keying are supported including Zero-Black keys, Luminance keys, Chroma keys and Alpha keys. All compositing is performed in the digital domain using a full 32Bits of data for D1 quality. No lossy image compression techniques are used, so images with any number of layers are as crisp and clear as they were in the original images. Layers can be faded in and out to variable transparencies at variable rates of speed. Layers can appear and disappear and move around anywhere. All Layers are completely adjustable. Movement of images/layers can be anything from linear to smooth with adjustable acceleration and deceleration. Dissolves 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

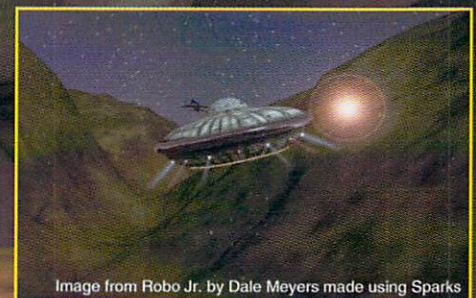
Now Animators can include "High-End" procedural animation effects to their work. Do in minutes what would take days to set up! Particles can bounce with real world behavior with gravity simulation. Multiple point gravity wells allow bending and directing the stream, flock or swarm of particles. Complete 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.

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 - partele/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 by NewTek for use with the Video Toaster System.



RETINA II

Upgrade available for current Retina owners!

The Best has just gotten better!

Full 32Bit Zorro III, Full 32 bit blitter, Higher Resolutions, the Fastest Yet!

Built in Video Encoder with S-Video and Composite output!

In an A3000 or A4000 the Retina II is unbeatable for use with TVPaint and Rendering software.

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.

Retina Version - Suggested List \$449.95



VLab Y/C

Digitize 30fps Video from Video Tape or Laser Disk

The VLab includes an extensive software control system designed to make digitizing as easy as possible. For the first time building lengthy digital video segments no longer requires expensive and slow frame by frame digitizing. Using a revolutionary new concept, MacroSystem has provided a new Interleaved Frame Recording feature (VLab and VLab Y/C).

Interleaved Frame Recording or IFR basically allows the VLab to digitize full 30fps digital video sequences to HardDisk by making multiple passes of the recorded video. The VLab will digitize the number of frames specified to either HardDisk or RAM as sequentially numbered frames.

Hardware Features:

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

Software selectable inputs include:

- VLab - 2 Composite inputs.
- VLab Y/C - 1 Y/C & 2 Composite inputs.
- VLab 1200 - 2 Composite inputs.
- Time Base Corrector not required.
- Compatible with the Video Toaster, OpalVision.
- VLab control windows allow you to keep multiple critical controls open at the same time. And the monitor window display lets you see exactly what you are digitizing.
- Real time Color, Contrast, Luminance and Gamma, Luminance, Chrominance controls.

- AGA chip set support.
- Includes ADPro and ImageFX Loader modules.
- Save images in 24 bit, YUV, or AGA.
- The VLab is supported by many popular Graphics programs.
- Supported by the Nucleus Personal SFC.



Features:

- 15 - 80KHz Hor. Freq. and 50 - 110Hz Vert. 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.

HOT NEW PRODUCTS!

Toccatta - Full 16Bit Audio card with 3 stereo inputs, 1 stereo output, microphone input. 48Khz sample rate recording and playback from HardDisk. On board mixer. Record and playback simultaneously. 16 channel playback capability. Reads Audio SMPTE Time Code \$599.95

Warp Engine - Amiga/Video Toaster Accelerator. Base Engine 28Mhz up to 64MB Ram and SCSI II HD Controller. Does not use any Zorro Slots! Other configuration available. Base Warp Engines start at under \$1000.00!

MacroSystemUS

24282 Lynwood, Suite 101, Novi, MI 48374 (313) 347-6266 Phone (313) 347-6643 Fax
MultiLayer, Sparks, Retina, Vlab and TVPaint are trademarks of MacroSystemUS. The VideoToaster and LightWave 3D are trademarks of NewTek, Inc. ADPro is a registered trademark of ASDG, Inc.

NEW PRODUCTS

Compiled by Josh Moscov

S-VHS VCR

S-VHS Editing System

Product: "S" Series of S-VHS VCRs

Description: Editing system comprised of the AG-7750H hi-fi editing VCR and AG-765H source player

Price: AG-7750: \$7,500; AG-7650H: \$5,500
Panasonic Broadcast & Television Systems Co.

One Panasonic Way
Secaucus, NJ 07094

Circle Reader Service No. 1
(800) 524-0864

The AG-7750H/AG-7650H have built-in, three-dimensional time base correctors; the TBCs have a full field of memory and a correction range of 262-1/2 lines.

The console features enhanced capstan



servo control delivering high-speed viewable search at 32x normal speed. The new editing system offers expansion capabilities including a RS-422A 9-pin serial interface to high-end professional edit system controllers. A dual-loading system with half- and full-loading tape transport modes for high-speed response is available as well.

Edit Controller

Product: Editizer Macintosh Version

Description: TAO software on Macintosh and Windows platforms

Price: \$2,495

TAO

501 W. 5th St.

P.O. Box 1254

Rolla, MO 65401

(800) 264-1121

Circle Reader Service No. 2



TAO's complete product line—the *Editizer*, *StudioNet* and consumer-based *VISCA* systems—are now available on Macintosh and Windows platforms.

Song List

Product: The Mini-Encyclopedia of Public Domain Songs

Description: Reference guide to famous songs

Price: Not available

BZ/Rights & Permission Inc.

125 W. 72nd St.

New York, NY 10023

(212) 580-0615

Fax (212) 769-9224

Circle Reader Service No. 3

Containing over 600 titles, the *Encyclopedia* lists songs that can be used free of charge in the United States in productions since they are no longer protected by copyright laws. It is available in print and on diskette for the IBM and Macintosh.

Waveform/Vector Rasterizer

Product: WVR500

Description: Waveform/Vector or combination monitor and rasterizer

Price: \$1,795

Tektronix

26600 S.W. Parkway

P.O. Box 1000

Wilsonville, OR 97070

Circle Reader Service No. 4

The WVR500 performs the



composite NTSC or PAL signal-monitoring functions of a standard two-input waveform/vector monitor. Live video passes through the unit unprocessed and free of artifacts, while gratitudes are electronically generated for maximum clarity.

The unit offers two monitoring features. Users can select a color indicator that serves as a visual alarm for any signal that exceeds the 100 IRE/700 mV level. In addition, they can choose a line-select function that examines vertical interval test signals or VITS.

The WVR500 can be used in a variety of monitoring environments such as remote, multiple feed and multiple location.

ARexx Software

Product: REXXVar 1.0

Description: Exchange data software for ARexx variables

Price: \$25

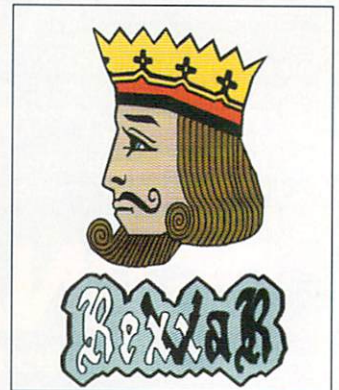
AugmenTek

3606 S. 180th St., C-22

SeaTac, WA 98188-4339

(206) 246-6077

Circle Reader Service No. 5



The software allows for the exchange of data between ARexx variables and any program that uses input and output files. The output from a command or program, including a meaningful error code, can be placed in one ARexx variable or a stem array; input command can be read from either an ARexx variable or stem array. With one line of ARexx code using REXXVar, words in a variable or elements of a stem array can be sorted, searched, edited, appended or written elsewhere. These functions are possible with standard AmigaDOS commands. The software requires AmigaDOS/Kickstart 2.04 or higher.

LightWave Models

Product: The Jurassic Collection

Description: Package of four, detailed dinosaur models

Price: \$199.95

Dimension Technologies

2800 W. 21st St.

Erie, PA 16506

(814) 838-2184

Circle Reader Service No. 6

Each model in the *Jurassic Collection* contains more than 20,000 polygons and includes walk and run scene files. The new LightWave 3.0 Bones feature allows the user to add realistic muscle and breathing movements.

DC Power Supply

Product: Power Station-II
Description: Worldwide DC power supply
Price: Model 12055: \$319.95; Model 12120: \$399.95
NRG Research
Marketing Division
840 Rogue River Hwy.
Bldg. #144
Grants Pass, OR 97527
(503) 479-9433
Circle Reader Service No. 7



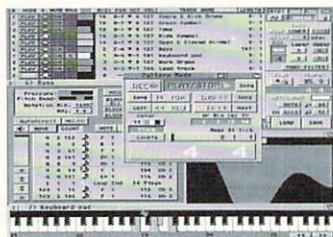
The *Power Station-II* converts power from any AC source (85-264-volt AC) into perfectly regulated 12-volt DC output. Five outputs (four 4-pin XLR and one cigarette lighter) allow connection of multiple devices, such as cameras, decks, lights, monitors or virtually any 12-volt DC operated equipment.

Utilizing an advanced pulse-width modulated power supply, the Power Station can provide such benefits as low heat, light weight, high reliability and full-load protection.

Music Software

Product: Sequel
Description: Music sequencing software for the Amiga computer
Price: \$139
Diemer Development
12814 Landale St.
Studio City, CA 91604
(818) 762-0804
Circle Reader Service No. 8
Using any MIDI instrument, *Sequel* allows musicians to

record and produce 32-track tunes, score accompaniment for live gigs, and author music for video, games and presentations. Unlike other



sequencers, both MIDI and Amiga controls appear in Sequel's track list display. Simple mouse clicks adjust MIDI channel, program, volume, octave and Amiga sound.

The unit imports standard MIDI and IFF music and sound files automatically based on incoming data and exports standard MIDI files and tempo maps. It syncs to SMPTE via MIDI time code, allowing acoustic overdubs on tape and frame-accurate video synchronization. A manual is included.

Home Video Screenwriting Course

Product: Commercial Screenwriting Video and Handbook
Description: Step-by-step guides to writing screenplays



Price: \$39.95
Media Works
P.O. Box 191
Bogota, NJ 07603
(201) 907-0705
Fax: Same
Circle Reader Service No. 9
Taught by New York City college screenwriting instructor

New Updates

Master Clock

Product: ES-180A
Description: WWV/WWVH Master Clock
Price: \$2,100
ESE
142 Sierra St.
El Segundo, CA 90245
(310) 322-2136
Circle Reader Service No. 10
The *ES-180A* has improved



accuracy to +/- 2.5ms of UTC when locked and <10ms/day drift when WWV is not present. It now has the ability to query the RS-232 output up to 20 times per second and includes a .56 inch front panel L.E.D. display. The unit can drive more than 100 digital slave displays as well as being able to do five-frequency scanning, automatic DST correction, battery backup, RS232C output, lpps and AM/PM indication.

Amiga Online Reference Manual

Product: Version 2.2
Description: AORM hyper-text tutorial software
Price: \$34.95
Area52 c/o David Tiberio
6 Lodge Lane
East Setauket, NY 11733
(516) 476-1615
Circle Reader Service No. 11
The *Amiga Online Reference Manual* (AORM) features can assist the user in a variety of areas, such as LightWave 3D, Art Department Professional and most Workbench tools and utili-

ties. The LightWave module includes help for using the Layout editor and Modeler. All functions listed have been designed to be as user-friendly as possible with LightWave; a database of terminology specific to the Video Toaster is included.

The Art Department Professional module contains online help for using Operators, Loaders, and Savers, along with special tricks in using these in conjunction with each other. A quick reference to the AREXX command set is included.

The AORM is compatible with Workbench 1.3, 2.04, 2.1 and 3.0 and requires 256K of memory.

Amiga Outline Font Editor

Product: TypeSmith 2.0
Description: Outline font editor package
Price: \$199.95
Soft-Logik Publishing Corp.
P.O. Box 51089
St. Louis, MO 63151
(800) 829-8608
Fax (314) 894-3280
Circle Reader Service No. 12
TypeSmith 2.0 can automatically create bitmap fonts based on the font outline. It can load AmigaDOS and PostScript bitmap fonts allowing the user to edit them by simply clicking on and off their dots. The update can also produce font outlines from bitmap pictures. And character generation required for font outlines can be done by the built-in autotracer. Generated fonts can then be edited quickly and professionally. In addition, 2.0 has the ability to load Windows and Macintosh PostScript fonts.

Bruce Hidemi Sakow, the *Commercial Screenwriting Video and Handbook* provides the student with all of the elements for a screenplay that agents, actors, and producers look for. The materials are intended for writers, actors, filmmakers and videographers.

Amiga Prompting Software

Product: SmoothTalker
Description: Videoprompting software
Price: \$299.95
Video Design Associates
P.O. Drawer 1089
Lake Worth, FL 33460-6624
(800) 749-7266
Circle Reader Service No. 13



SmoothTalker software features smooth and variable scroll speeds that are accessible from a wired, handheld speed and index controller. It includes a 36-point prompter font and will also load any Amiga font and mirror image it for use in a prompter system.

The software can be run on any Amiga and will display on a standard NTSC monitor with composite video input through the Amiga's video output, or on a standard television with an RF unit. A variety of different packages are available.

Amiga Accelerator

Product: A1230 Turbo+ Performance Series II Accelerator and A1291 SCSI Kit Performance Series II
Description: Accelerator for the Amiga 1200
Price: Not available
Great Valley Products

657 Clark Ave.
King of Prussia, PA 19406
(215) 354-9495
Fax (215) 337-9922
Circle Reader Service No. 14
The A1230 Turbo and A1291 SCSI Kit push the Amiga 1200's performance to its maximum with a 50MHz or 40MHz 68030 with a socket for an optional match co-processor chip (68882), up to 32 MB of RAM, a battery-backed real-time clock and a DMA Peripheral Port (DPP). The DPP adds a high-speed external SCSI-II DMA port to the A1230 Turbo+ which can achieve sustained transfer rates of 4.2 MB per second.

Edit Controller Newsletter

Product: *The Edit Point*
Description: Quarterly publication from TAO
Price: Free by calling TAO
501 W. 5th St.
P.O. Box 1254
Rolla, MO 65401
(800) 264-1121
Circle Reader Service No. 15
The newsletter provides information on product releases, applications, system configuration and technical information on edit system design and operation.

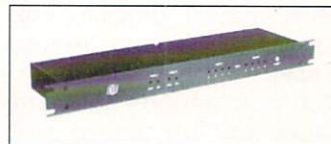
LightWave Object Set

Product: Diner Set
Description: A LightWave set of '50s diner. objects
Price: \$65
Terra Nova Development
P.O. Box 2202
Ventura, CA 93002
Circle Reader Service No. 16
The *Diner Set* includes a variety of objects such as a jukebox, counter, booths, a pay telephone, dishes, cups, silverware and other items for place settings. In many cases, there are both high- and low-resolution versions of objects. The compressed two disks installs automatically into the Toaster drawer. All of the objects were created by

award-winning computer artist, Bradley W. Schenck. A manual is included that explains the objects and gives advice on their use.

Audio/Video Distribution Amplifier

Product: ES-2940
Description: Dual A/V distribution amplifier and sync
Price: \$900
ESE
142 Sierra St.
El Segundo, CA 90245
(310) 322-2136
Circle Reader Service No. 17



The *ESE-2940* is equipped with dual 1 X 4 audio and video distribution amplifiers and a five-output blackburst generator. The unit was built for post-house editing bays and broadcast systems but has also been used in interactive classroom applications.

Sound Effects

Product: Gateway Series
Description: A set of five CDs with 427 sound effects
Price: \$99.95
Energetic Music
P.O. Box 84583
645 S. Massachusetts
Seattle, WA 98124
(800) 323-2972
Fax (206) 467-6931
Circle Reader Service No. 18
The disks include many sound categories, such as animals, machines, horror and guns. Each disc contains track listings of each effect and time duration. There are no extra fees or reporting after purchasing the set.

Background Collection

Product: Beyond Backgrounds Pro Set
Description: A 10-disk set of

high-resolution 736 x 480, 16.7 million-color IFF images
Price: \$99.95
Frostbyte Systems
P.O. Box 481
Station D
Toronto, Ont.
M6P 3K1 Canada
(416) 769-7516
Circle Reader Service No. 20
Designed on a Silicon Graphics Iris workstation, these images were created to work with the Video Toaster, FireCracker 24, DCTV and other 24-bit display devices. They can be used in a variety of situations such as backdrops in video productions, multimedia and business presentations. They were created by Derek Grime of Beyond Graphics.

On-Camera Light

Product: Vari-Lite Pro
Description: On-camera light with electronic management system
Price: \$229.95
NRG Research
Marketing Division
840 Rogue River Hwy.
Bldg. #144
Grants Pass, OR 97527
(503) 479-9433
Circle Reader Service No. 20



The light output of the *Vari-Lite* can be instantly adjusted within a range of 10 to 100 percent without removing hot bulbs or having to fuss with power-robbing diffusion filters. The unit eliminates color shift and conserves precious battery power by only using that which is required for the selected light level.

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- One S-Video Output
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SuperGen SX

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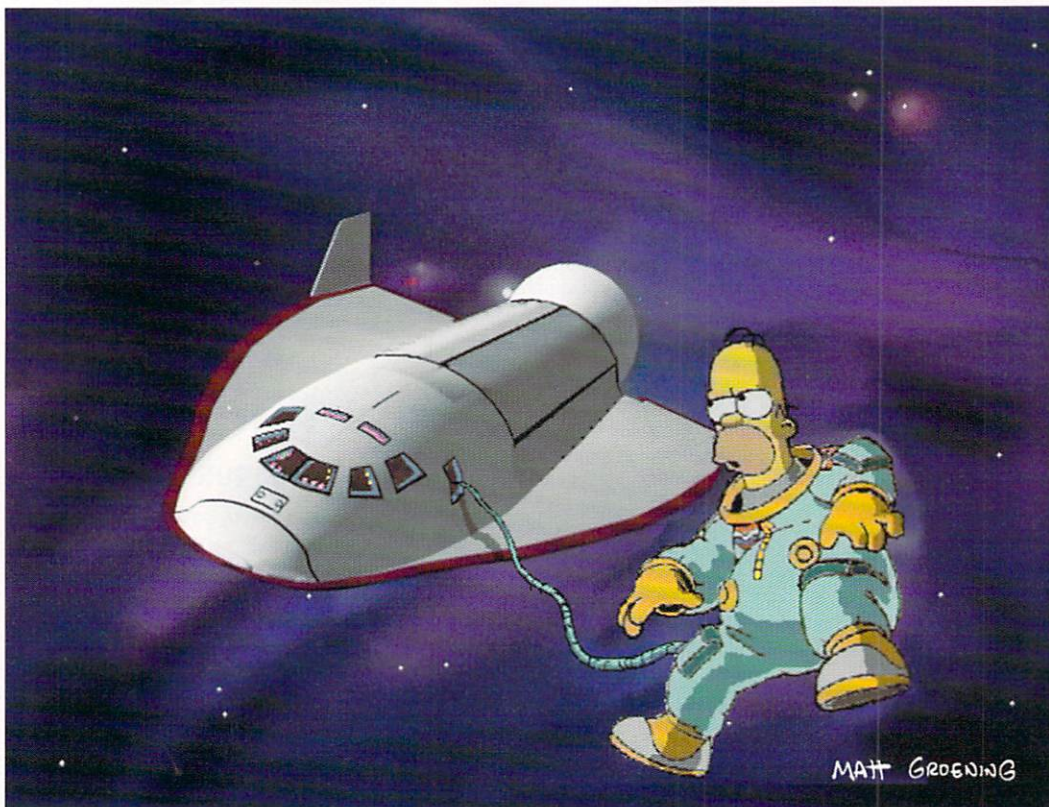
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TOASTER TIMES



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Commodore Posts Bleak Financial Performance

Reporting a loss of \$356 million for the year ended June 30, 1993, West Chester, PA-based Commodore International Ltd. might want to consider relocating to Europe, where shipments of its new CD-32 entertainment machines and Amiga 1200 are much better compared to here.

Of the full-year loss, \$237 million were in charges for asset write-downs, restructuring, and special pricing and promotional allowances. Losses for the quarter were at \$82.9 million. Sales for the year of \$73.6 million were down nearly 50 percent, while full-year revenue was off 35.2 percent to \$590.8 million.

Continued on Page 24

1994: A Space Parody

By Josh Moscov

Homer Simpson does not have the intellectual abilities of German philosopher Friedrich Nietzsche or the stamina of Michael Jordan, so he's the ideal candidate for NASA's "Regular Guy In Space" program. Realizing his true potential, Fox has tentatively set aside Feb. 17, 1994, to launch Homer into outer space during *Deep Space Homer*, a parody of '60s American society and '90s science fiction.

The episode focuses on the fact that NASA is losing money and wants to improve the public's opinion of the space program. NASA believes that the "Regular Guy In Space"

marketing angle will give working America a greater appreciation for space exploration.

And who could be a better candidate to represent the labor force in space than Homer Simpson? Al Bundy maybe?

Like most "regular guys," Homer at this moment is probably both proud of the appointment and a bit terrified of his future, stellar trip. But, he can be assured of one thing: NASA and Fox have been thinking about his best interest and have provided him with a strong space shuttle, modeled on a Video Toaster 4000. Yes, the Toaster has finally entered

the world of Matt Groening and the Simpsons.

The location of that 4000 system is Film Roman, a contracted animation studio that works for Fox and other major networks. According to Film Roman animators, the Toaster is being called upon more often as an animation aid on many of their productions. The Simpsons episode, though, is the first instance where a LightWave 3D image has made it to the final cut. "Deadline pressures have made it impossible for us to complete a project with the Toaster. We were going to use it for several shots in a major work in progress. In one of those, I built a wide

'Disneyesque-pan shot' of a ballroom which worked out quite well. But we had to stop production so none of the images were ever used. It's kind of ironic that it happened like that because the Toaster in many ways can save quite a bit of time, especially for our layout artists," said Film Roman animator Dale Hendrickson.

It was Hendrickson who completed the 3D model of Homer's shuttle from his own line sketch that had been approved by Groening. Relying almost exclusively on LightWave 3D for the modeling, he completed the final line image by tracing his computer rendering on a tradition-

International Watch

By Christina Knighton

TOKYO

NewTek to Explore Asian Font Options

NewTek is in negotiations with Japanese distributor D-Storm to further enhance the Video Toaster's Asian character sets, according to Scott McCallum, NewTek's international sales manager.

"From feedback we gather at the major trade shows in Asia, we feel this enhancement will dramatically increase the Video Toaster's market share. It would be quite a technological breakthrough, considering the Kangi alphabet alone contains over 5,000 characters, all of which can be express on a standard 101 keyboard," said McCallum.

No release dates have been set.

SEOUL, KOREA

KMEN Stays Competitive in Korean Cable Market

The Korean government has opened the cable market to private enterprise so KMEN (Korean Media Enterprises Ltd.), under contract by government-owned KBS, has sought new ways to stay competitive. The network has enlisted video systems designer Hyueng Suk Kim to design a turnkey solution for cable operators; his standard cable operator configuration includes the Video Toaster.

Continued on Page 26

Babylon 5 Series Debuts on Warner Bros. TV Network

By Josh Moscov

The long-awaited premiere episode of the *Babylon 5* syndicated series aired Jan. 26 on Warner Bros. Domestic Television Distribution's Prime Time Entertainment Network (PTEN).

Set in the year 2258, the *Babylon 5* series takes place aboard a five-mile United Nations space station where humans and aliens attempt to work out their differences. *Midnight On The Firing Line*, the first episode, established the characters and alien races that interact on the station. It unveiled where certain alliances will be, but for the most part doesn't have a specific theme. "The plot in *Midnight* sort of focuses on what's going on with the Narns. One does get the feeling that they are trying to pull a fast one," said Shannon Casey, visual effects producer at Foundation Imaging.

Continued on Page 26

NewTek Addresses Bugs, Offers New Features in Releasing 3.1 Toaster Software Upgrade

By Phil Kurz

Faster framegrabs, gradient fonts and borders and Modeler ARexx macros are a few of the more significant features NewTek has included in its release of 3.1 Video Toaster software.

The upgrade, which is being sent free to registered users of the Video Toaster 4000 and 3.0, also corrects a number of bugs.

In the Switcher alone, more than a dozen bugs have been fixed, including those causing framegrabbing problems for GVP 68040-accelerated Toasters and with loading framestores from the Switcher.

NewTek also has addressed bugs in ToasterCG, LightWave and Modeler. In ToasterCG, boxes on scroll pages now resize correctly, page rendering with the F9 key now works properly as does the Backspace key.

In Modeler, the point order from the ARexx XFRM command now matches the object point order, drilling with a grid of lines works and the system crashes resulting from resizing the screen with a moving display have been eliminated.

In LightWave, corrections have been made to raytraced refractions, skeletal deformations on morphed objects, morph option updates in layout views and antialiasing on two-point polygons. The 3.1 release also eliminates system crashes resulting from Frame End Beep.

The upgrade also offers Toaster 4000 and 3.0 users a number of enhancements to the Switcher, CG and animation system.

The Toaster Switcher now features a significant improvement in the AutoHue, two new projects, including effects, faster framegrabbing and motion removal and new effects, including Screech, Smash, SnapOffR and Viewfinder. Toaster 4000 owners also get the atom.aa effect.

Besides the ability to create gradient fonts and borders, the 3.1 ToasterCG offers two new ColorFonts, City and SansMarble.

The software offers LightWave users a bevy of new modeling and animation features. These include new objects, such as SpaceDestroyer, Sword, DesignerChair and DesignerLamp, the ability to lay frame numbers and short text descriptions over the bottom of rendered frames and a Null Object button that's been added to the Objects panel.

Modeler features more than a dozen new tools to make object creation simpler. Among these are the ability to scale objects to one-half or double size around their centers, to make motion files from mathematical functions of time, to bevel polygons with multilevel bevels and to wrap an object onto a sphere.

NewTek announced the release of 3.1 at press time. In next month's issue of Video Toaster User, we will explore the upgrade in more depth.

VTU

1994 Continued From Page 22

al animation disk. The main shuttle scene was made up of 160 frames and 1,500 polygons; each frame was rendered in five minutes in medium resolution with high antialiasing. The shuttle shots

On-Line Services Bursting with Toaster, Amiga Information

More and more computer companies are placing information and graphics with major on-line electronic services.

Already providing technical assistance through the Amiga Vendor Forum of CompuServe, GVP has placed a freely distributed EGS (enhanced graphics system) Developer's Kit on that information network as well. This latest addition to the GVP file library makes it possible for anyone with a modem to access the most current files concerning EGS-development and GVP products.

Seven Seas Software has developed Math-Vision Gold, an Internet tech-support link for users of LightWave Modeler's new macro, MathVISION Plot.

The MathVision Gold net is available to subscribers of MathVISION Video Gold, a support program. Subscribers receive training, E-mail, an 800 number for support, monthly electronic newsletters, and upgrades to MathVision for one year.

The net is accessible from Compuserve, BIX and Genie. Users of LightWave who are interested in receiving the net can call (206) 385-1956.



were then made into cel animations by S.Korea-based Anivision.

Having acquired a Toaster several years ago, Hendrickson, a seasoned artist, noted how it has changed his view of technology and work. "Before the Toaster, I wasn't into computers and didn't even know the keyboard. I had been waiting for computer technology to get to the artist's level, because I wasn't interested in learning programming. It seemed like a logical place to start doing my animations on the desktop as well as pencil testing and other 3D chores," he said.

Hendrickson said that the shuttle presented some challenges to his modeling abilities. "I do not consider myself an expert modeler by any means; my main difficulty in rendering the shuttle was in modeling it with the right amount of detail. I actually ended up building it three times. The first attempt took a day and a half and just wasn't working out because I was making it too complicated. On the second try, I was done in four hours while the last modeling session took only 30 minutes. I realize now that it would have been easier to have designed the shuttle with the Toaster first, and then drawn it for Matt.

"At the same time, the Toaster was extremely helpful

for making the shots where the shuttle is twisting and coming up through the atmosphere. Using it was much faster than having some animator try to figure out all of those in-between specifics," he explained.

Much of *Deep Space Homer* takes place on Hendrickson's Toaster-created shuttle. In one of many scenes where Homer gets into trouble, he actually breaks the door off the shuttle and is sucked out into space. While on-board, he frightens the other astronauts by violating a NASA food rule when he opens a bag of Ruffles potato chips (the chips were rendered in LightWave 3D too) that immediately begin floating around the shuttle. And in what may be the most humorous space scenario, Homer metamorphoses into Popeye during a centrifuge test. "He looks so funny since he spins faster and faster and the G-force has sucked in his face. That's the beauty of cartoons. They have quite a hard time getting back to earth, too," Hendrickson commented.

"And of course, there are scenes where we see a very '60s-looking Marge Simpson hanging out with the other astronaut wives as they view the shuttle in space. It just reinforces the parody of the episode," he continued with a chuckle.

Working closely with the

industry heavies, Hendrickson says that Groening and Gracie Films, the main owner and developer of the Simpsons, have been very impressed with the Toaster's use on *Deep Space Homer* and from several of NewTek's demonstrations of its many other applications. Gracie Films, in fact, houses a Toaster 4000 as well, but Hendrickson doesn't know if its been put to the test yet. He believes that Groening may call on the services of the Toaster in future projects; Hendrickson may be using it on other Film Roman assignments too. "The Toaster has definitely proved itself as an animation aid for us. It remains to be seen how much it will be used as a final output device. I do think that we will try to integrate it into our editing bay at some point."

And in the near future, the Toaster allows Film Roman animators to make the Simpsons "Last Supper" possible. Stay tuned.

When not attempting to amuse the American public through his art and animations at Film Roman, Dale Hendrickson runs his own company, Cat Planet, which specializes in graphics, sculpture and effects for film. He can be reached at 818-994-9073.



Commodore Continued from Page 22

The effect of the cost-reducing restructuring is revealed in Commodore's report for the opening quarter of fiscal 1994. For the three months to Sept. 30, its loss narrowed to \$9.7 million from the year-earlier \$18.8 million, though sales at \$82.6 million were down 47.9 percent.

According to a footnote to its year-end statement, "The company's financial position and operating results raise substantial doubts about the company's ability to continue as a going concern."

The company reported that its sales for the quarter reflected a rebound from the dis-

appointing June level from demand for its Amiga 1200 computer and the CD-32; their Philippine factory is shipping up to 22,000 CD-32 units a week to Europe.

At the end of the quarter, Commodore said it had assets of \$240.1 million and liabilities of \$301.3 million, leaving a negative worth of \$61.2 million.

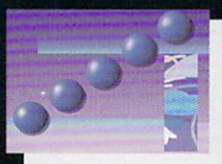
[Compiled from information published in "Computer Maker Has Huge Loss," Nov. 13, 1993, The Philadelphia Inquirer; and "Commodore's '93 FY Shows Negative Worth," published Nov. 29, 1993, in TWICE.



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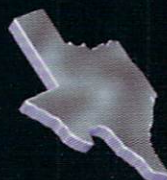
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International Continued from Page 23

SAN JOSE, COSTA RICA

Costa Rican FBI Enters Video Age

OIJOTA, the Costa Rican FBI, is developing a set of interactive training tapes using the Video Toaster to combine animation and live action. Agent Frank Alvarado is producing the tapes in a production studio that includes a Hi8 editing system and Betacam decks in addition to the Toaster.

"In one scenario, recruits choose a method of entry into an animated building and based on the surrounding conditions, the trainees either see themselves catching the live-action bad guy or getting killed. It's really an interesting way to conduct a training," said Alvarado.

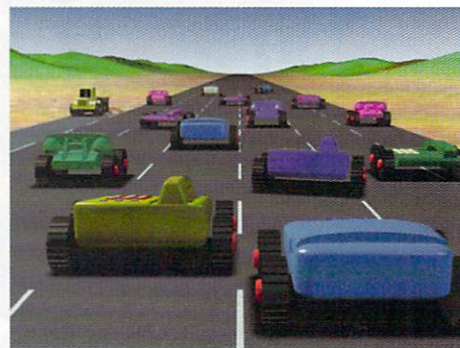
SAN JOSE, COSTA RICA

Toaster Dealer's Production House Active in Commercial Animation

Arte Digital, an offshoot animation house of Video Toaster dealer Computacion Creativa, has become competitive in the video production marketplace. "We average four to five commercials per month," said Arte Digital founder, Javier Abreu.

The company has completed projects for ICE, the national telephone company and "Holares Crea," a state lottery.

"I believe that we are the first to explore particle animation in Costa Rica. And the ICE project has now opened the door to a new programming department



Phones on the go—an Arte Digital animation from the ICE account.

to Arte Digital," Abreu explained.

The animation house will produce a Coca Cola campaign this spring.

VTU

Babylon 5 Continued From Page 23

Led by reptillian-looking ambassador G'Kar (Andreas Katsulas), the Narn Regime is one of five alien groups that cohabitate *Babylon 5* in addition to the earthlings. Thus, Commander Sinclair (Michael O' Hare) finds himself serving as a diplomat between the alien federations throughout the series. In addition to Katsulas and O' Hare, *Babylon 5* stars Jerry Doyle as security chief Michael Garibaldi and Richard Biggs as Dr. Stephen Franklin.

Casey went on to comment that *Babylon 5* series creator J. Michael Straczynski has been working on a five-year story arc for the series in which a number of events take place involving key characters and races in a given time period. "But each of the episodes isn't linked together that obviously, even though there are definite patterns. And the plan is still very tentative," she noted.

Foundation Imaging—whose staff includes three Emmy award winners for Outstanding Individual Achievement in Special Visual Effects for the *Babylon 5* pilot—are working on as many arresting visuals as possible to enhance each of the shows. *Midnight On The Firing Line*, had between 20 and 25 effects. "There were a lot of very exciting battle sequences in *Midnight* that could only have been done with real physics. The shots are very complicated, but look quite realistic," Casey said.

Like other major network science fiction series,

Foundation Imaging relies strongly on LightWave 3D for different effects. The company owns 22 Video Toasters, but Casey said that they use LightWave almost exclusively. "When it comes to the Toaster, many people think of the switcher effects. We really don't use that part of it," she clarified.

While Foundation Imaging has risen to notoriety around Hollywood for its Emmy Award and the potential for success with the syndicated series, Casey made it clear that they are trying to learn much more about LightWave. There is a consensus among the staff that the software has not been fully explored when it comes to creature animation, skin textures and the making of CGI astronauts. "With the syndicated series, we want to strive for even more photorealism and be able to mimic hand animation as well as that which is created on higher-end animation stations," Casey said.

There shouldn't be a problem meeting those artistic goals, considering that Foundation is at work on episode 12 of 22 in the series. And with a five-year story arc in the planning stages, a great many special effects opportunities may lie in the future.

Babylon 5 airs Wednesday evenings from 8-9 p.m. (West Coast time) on PTEN.

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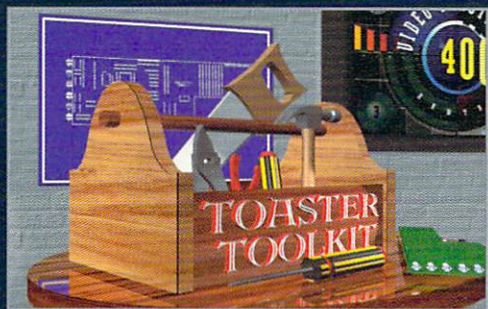
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Circle Reader Service No. 113

DEAR JOHN

Alpha Images

A Crash Course in Traveling Mattes

By John Gross



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

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



Figure 1



Figure 2

Q: I have not been able to find the missing letters of "v" and "w" in the Stop Regular font (listed under B&P Graphic section). Also, where is the Stop Bold font? Is it just my Toaster 4000 or is this a technical error?

Steve Choe
Canoga Park, Calif.

A: The Stop Regular font is a capital letters-only font. Make sure to use only capital letters when writing anything in this font. Unfortunately, the Stop Bold font did not make it into the shipping version of the Toaster.

Q: I'd be willing to pay for, but more willing to obtain for free, the secret to time-lapse, framestore

recording to hard disk via live or prerecorded video input. Also, I would like to use variable time values (a frame every "nth" second, minute, etc.).

Myke Muller
Sunland, Calif.

A: If you have a Digital Processing Systems Personal Animation Controller and TBC IV, you have what you need to perform time-lapse, framestore recording. If you don't have access to equipment that allows you to perform time-lapse recording, you can control the Switcher with an ARexx script that will grab frames at specific intervals.

There is a script included with the Toaster called

Timelapse.rexx. It is found in the Toaster/ARexx_Examples drawer. To use it, simply have the Toaster Switcher screen active, then return to Workbench and open a shell. Change directories to the ARexx_Examples drawer and type: rx Timelapse (delay in minutes) (number of frames) (name).

The arguments in parentheses must be stated for the script to work. Let's say you wish to take a camera source plugged into input 1 and grab 100 frames, one every five minutes, and save them to your framestore directory using a common name of "grab." You would type: rx Timelapse 5 100 Grab. The frames would be saved with the name "grab" plus the elapsed time.

Q: What exactly are alpha images used for in LightWave?

Susan Torna
Springfield, Ill.

A: Alpha images are used primarily for creating traveling mattes for animations. Let's say you want a spaceship to fly through some live video. By creating a traveling matte of the flying spaceship, you can use it as a "keyhole" to key in the animation of the spaceship. You would basically end up with two near-identical animations—one of the flying spaceship and one of the spaceship all in white over a black background (see Figures 1 and 2). The white over black animation would be used as the alpha channel (or video "cutter") in a switcher to combine the original flying spaceship animation over the live video.

If you are a 2.0 user and want to create a matte, you would have to turn your background black and turn all of the surfaces of every object in your scene to white. Of course, this means you would probably want to resave your objects with a new name so you wouldn't overwrite your old settings.

After that, render the animation twice, once with normal settings and then with everything turned white. With 3.0, all you have to do is turn on the Save Alpha Images button and give a name and a path for the saved images. LightWave can save the alpha and the normal images at the same time!

Furthermore, you can use alpha images in LightWave to determine the amount that a selected foreground image (or sequence) will be blended into the objects and the background. The whiter the alpha image, the more the foreground image will be blended. Since alpha images contain 256 shades of gray, white represents 100 percent blend, while black represents 0 percent blend. Fifty percent gray would provide a 50 percent blending of the foreground image and the objects/background.

Continued on Page 32

STREETC H



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INTERWORKS

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DEAR JOHN

Any objects that are solid will always appear as white when saved as an alpha image. Any transparent objects will appear as some level of gray depending on how transparent they are.

Q: I thought I understood ToasterPaint, but this problem has me colored red!

I drew a red triangle on a blue background. When rendered, it looked fine. I then saved it from within ToasterPaint. The next day, I loaded the file into TPaint and the image had these nasty edges; they were no longer hard and clean. It seems that loading the file into TPaint is the cause. My guess is that the decompression algorithms used by TPaint and the Switcher are different. I then drew another similar image, rendered it and then saved it from the Switcher. Those nasty edges were back when the file was loaded into TPaint, but not when loaded from the Switcher. The noise on the edge appears to be color-related. The Switcher-loaded image seems to be alive along the edges, as though some-

thing is cycling. Perhaps it's the two fields? The TPaint image, however, seems static. I tried this again using RGB images and you can't tell the difference between the original and the saved files. I'd like to know if there is a difference in the way TPaint and Switcher load framestores.

Dan Hogan
KLA Instruments Corp.
San Jose, Calif.

A: Welcome to the wonderful world of NTSC! You pretty much hit the nail on the head with the way the NTSC standard handles certain colors. It just so happens that red tends to be the biggest problem.

Here's what's happening in TPaint: When you save an image as a framestore from TPaint, the image is saved as a video frame. NTSC video (the American standard) doesn't handle certain colors well (such as red). Bright red tends to smear. Watch TV carefully and you will find that newscasters rarely wear any red, and if they do, it is always a muted shade. As soon as the image is saved as a

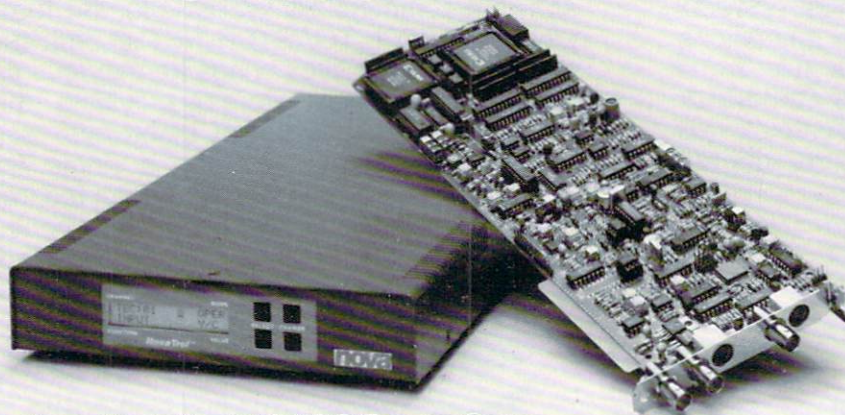
video frame and then loaded back into TPaint, you will notice that certain colors have smeared. Oftentimes, the background is not as "solid" as it was before.

Many contrasting colors when seen in video will tend to "crawl," especially if it is a still image. You'll experience dot crawl with moving video as well, but it isn't as noticeable.

To avoid this in the future, try not to use brightly contrasting colors in your video work. Also, when working in TPaint, always save your works in progress as RGB files until they are completed. Only then should you save them as framestores to be added to your video productions. RGB files will not exhibit the smearing or color loss that video stills do. Remember, though, as soon as you render one of those nice-looking RGB images out to the framebuffer, you are looking at a video image which may exhibit color smearing and dot crawl.

Q: I am currently a high school senior. I am writing to express the huge interest I have in the work you do. I

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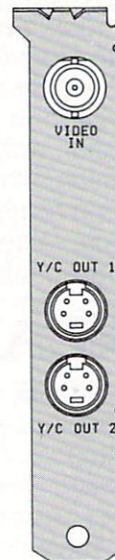
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DEAR JOHN

have always loved science-fiction entertainment, but it wasn't until six months ago that I enrolled in a multimedia class offered at my school, where I was able to acquire more knowledge about computer animation.

Although the class is mainly about making multimedia programs with the authoring system Amiga Vision, I was able to spend a great deal of time working with animation, paint, and other related programs on the Amiga 3000, such as Opal Vision, Image F/X, Digital Sound Studio and DeluxePaint IV. My interest, which my teachers call an obsession, is to be able to do what you do. I want this to be my career.

Now that I have entered this world of special effects and animation, I am not sure which steps to take to reach my goal. My question is very simple: Where should I go to receive the education necessary to be able to pursue my dream?

Cesar Vasquez
Yucaipa, Calif.

A: You have already taken the first step by becoming familiar with different computer programs that will be useful in your future. If you are interested in going to college to pursue your education, I recommend that you get into a program that is using software and equipment that is as up to date as possible. Since the world of 3D graphics is exploding all over, many institutions are offering programs of this type. Living in California, you will find many in this state alone.

Traditional art and animation education is very helpful in competing in this business, as is practical experience. Of course, getting experience is somewhat of a Catch-22: You can't get a job unless you have experience, and you can't get experience unless you have a job.

If you aren't interested in continuing your education, I recommend getting an internship (actually, you can do this while attending school) with a company that uses computer graphics. If you can afford to buy a Toaster, you can't beat LightWave as a learning tool and as one of your expert platforms (especially now that LightWave is becoming increasingly more popular).

The name of the game is practice and sacrifice. You need to constantly practice your art and sacrifice many things (like sleep!) to become great at what you do.

While looking for jobs, you will constantly be asked for your demo reel. Most places won't take you seriously without one. It's in your best interest to show only your best work. Do not include every animation you've ever produced. Professionals would rather see a short, definitive, first-class example of your work rather than a long reel that also contains run-of-the-mill stuff.

Hope this helps. Good luck!



John Gross is an animator for Amblin Imaging currently working on NBC's seaQuest DSV and is Editor of LightWavePRO, the newsletter for serious LightWave 3D animators.

Questions can be sent to:

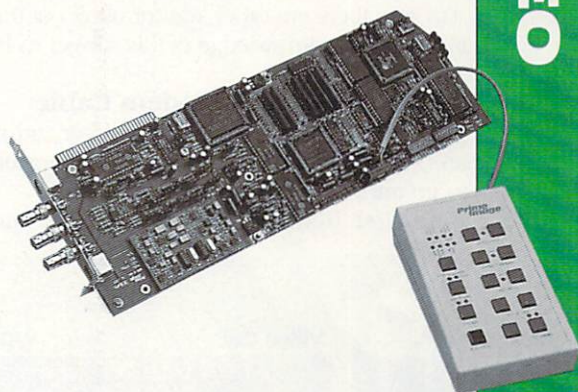
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Real-Life How-Tos

Transferring Graphics Files between the Toaster and Macintosh/PC

By Brent Malnack



When I bought my Video Toaster three years ago, one of the first things I wanted to do was framegrabbing; this involved importing images captured through a video camera and the Toaster into my Macintosh for desktop publishing applications. What I thought would be easy was more of a challenge than I anticipated. Finally, after months of trial and error, frustration and only partial solutions, I developed two methods that work equally well.

I'm sure there are other Toaster users out there who could benefit from my knowledge of this subject so here goes.

Method No. 1, Null Modem Cable

The null modem works best when transferring more than one image file. In fact, for large transfers you can set it to go and walk away.

The first item you need is a null modem cable.

based Redmond Cable (206-882-2009). This is where mine was made.

You'll also need modem or communications software on both machines. I use NComm on the Amiga and ZTerm on the Mac, but plenty of packages are available in public domain and are freely distributed. If you don't have the software, get in touch with a local Mac or Amiga users group or look for it on a local bulletin board. Don't worry if you don't have a modem: The software is the only requirement. The two computers don't need the hardware to talk to each other.

Once your setup is in place, make sure the settings are identical on each machine. For example, the data rate, stops bits, parity settings and transfer protocols should match up. Depending on your software, Z-modem is the best protocol to use because it's fast. However, some packages only allow X- or Y-modem.

You'll have to experiment to find the right data rate. I am able to use up to 57,600 baud between Z-Term and NComm. With other software, I could only go as fast as 19,200 baud. At 57,600 a typical 752-by-480 24-bit image, which is about 1 MB, takes about four minutes to transfer. If JPEG compression is used, the time can be cut to under one minute each.

Method No. 2, Floppy Disk

This method requires much less set-up time but is unsuitable for batch transfers. I only use it for one-at-a-time transfers.

To transfer files by way of floppy disk between an Amiga and a Mac, you need two software packages. If you have one of the latest versions of Amiga-DOS, you probably have CrossDOS already.

CrossDOS, included in the newer Amiga operating systems, essentially works invisibly to let users read and write 800K IBM format disks in the 3.5-inch Amiga floppy drive.

If you have a newer high-density floppy drive, such as in the Amiga 4000, you can read and write to high-density IBM disks.

On the Mac, you'll need a program such as DOS-Mounter; it does for the Mac much of what Cross-DOS does for the Amiga, although you cannot format IBM disks. But you can read and write to them, which is all you need.

It seems sort of ridiculous to need IBM format disks to send files between an Amiga and a Mac. But so far, there are no other solutions this simple.

A few years ago, I used a hardware/software solution called

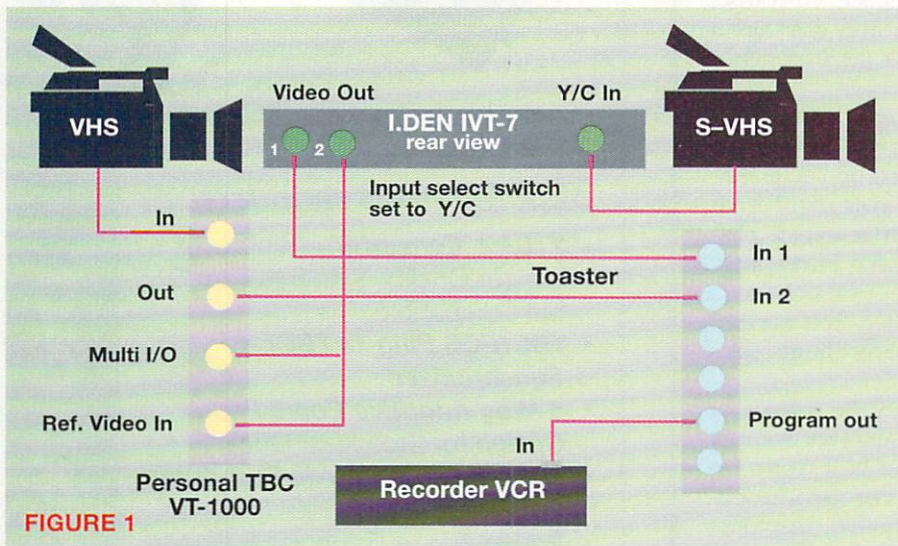


FIGURE 1

Basically, this is a cable that connects the Amiga serial port to the Mac modem port. On the Mac, this is the small, round nine-pin ADB (Apple Desktop Bus) port with a telephone icon branded into the plastic. Don't get it mixed up with the serial printer port. It has a printer icon. On the PC, serial ports are clearly marked and generally are the same as your Amiga.

Local computer dealers should have PC-to-PC modem cables, but you probably will have to have the Mac version custom made. The PC-to-PC cable should be equipped with a 25-pin female connector on each end. The PC-to-Mac should have a 25-pin female connector on one end and a nine-pin ADB on the other.

If you can't find a cable locally, try Redmond, Wash.

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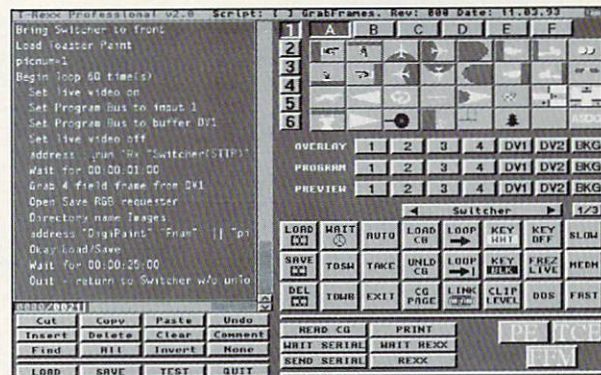
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TIPS & TECHNIQUES

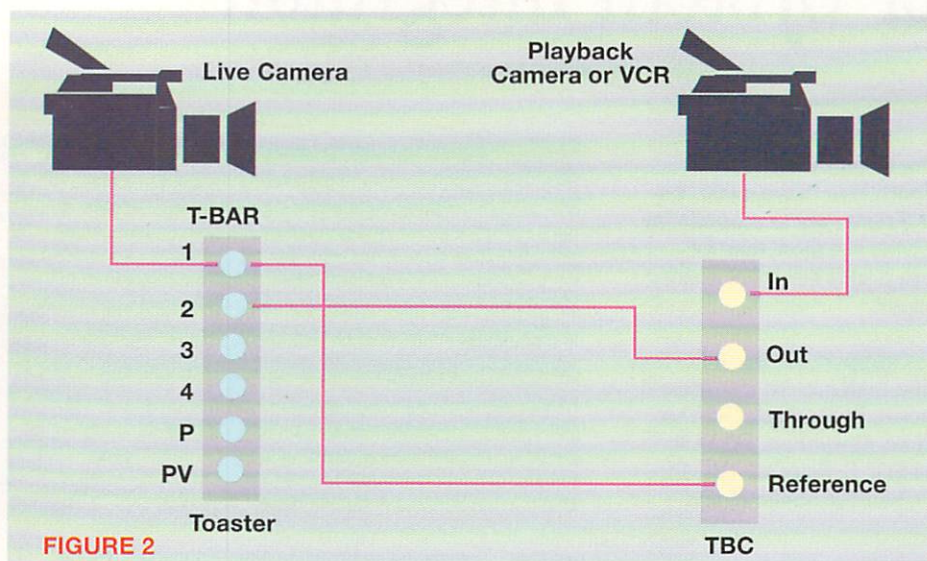


FIGURE 2

Mac-to-DOS, but it required your Amiga to have an actual Mac floppy drive.

There is a fine product called Emplant on the market that is a great Mac emulator for the Amiga. Utilities Unlimited, makers of Emplant, says you will soon be able to copy files between the Emplant and Amiga within the same

computer. I have an Emplant and am patiently waiting for the software that could make this the ultimate file transfer utility.

What's Next?

Let's assume you have a transfer method up and running and files are

zipping back and forth between platforms with ease. It won't take you long to discover that your Amiga files won't load into your favorite Mac program and vice-versa.

Amiga graphics files are generally saved in IFF format. Toaster framestores have a format of their own: NewTek's proprietary format. Mac graphics files come in several flavors, such as PICT, TIFF or EPS.

The Toaster will read only IFF or Framestore and in most Mac programs, only PICT, TIFF or EPS.

To put the polish on the apple, you will still need at least one program: Art Department Professional by ASDG.

ADPro runs on the Amiga and among its impressive list of image processing features is the ability to load and save almost any file format imaginable for any platform.

If you simply want to convert your Framestores to PICT or TIFF, ADPro is all you need; but, remember the 800K limitation on your floppy drive. Unless you have a high-density drive in your Amiga, these files can't go by way of a floppy disk.

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TIPS & TECHNIQUES

For the ultimate in file conversion, go with ADPro on the Amiga and Adobe Photoshop on the Mac or PC. In addition to its other great features, Photoshop will load and save JPEG format. (JPEG is a image compression module).

ADPro has JPEG as well. A typical 1 MB image can be reduced to 300K or less using JPEG without any noticeable image degradation. You'll be able to use your low-density floppy drive and serial port transfers will go much faster.

Hold on, we're not done. One final touch and your file transfers will be flawless. You need to compensate for the difference between the Amiga's rectangular pixels and the Mac's or PC's square pixels. For this you need to scale the images with ADPro or Photoshop. For Mac or PC images on the Amiga, scale them 88 percent horizontally. When sending Amiga images to the Mac or PC, scale them 88 percent vertically. This keeps the proper pixel aspect ratio and your images will not look distorted.

Whichever method you choose, once

your Mac or PC can talk to the Toaster, the doors to greater creativity will begin to open and your clients will be impressed!

This tip was submitted by Tim Lillethorup, a computer graphics artists who works in print and video media.

Connections

Another reader, Yusuf Shakoor, has sent a diagram of connecting two non-genlockable cameras together using TBCs. It is important to note that if one camera is live and not playing back a tape, only one TBC is necessary. See Figure 1. The second example I've provided connects the live camera's output to Toaster input channel 1 (using a T-Bar). The same signal is split off channel one with a T-Bar and patched into the reference input of the genlock. See Figure 2.

The playback camera or VCR output is patched into the input of the TBC. The TBC output is then patched into Toaster input two. If a T-Bar is used to split the signal as described, you will need to change the termination of input one.


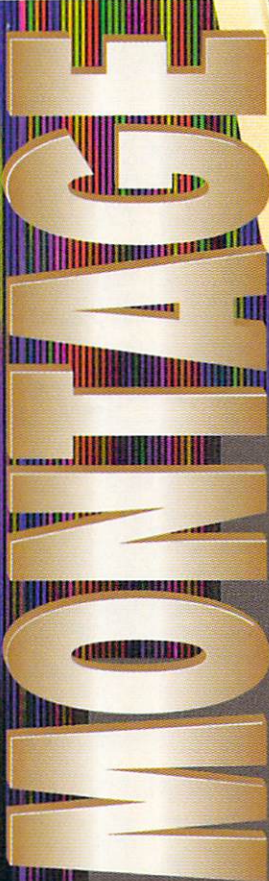
Go to the Toaster setup screen and click on the 1 in the Termination window. It will no longer be highlighted. This will adjust the Toaster properly so that the video signal is not too hot.

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For submitting his tip on signal routing, Yusuf Shakoor receives a free copy of *Mastering Toaster Technology*.

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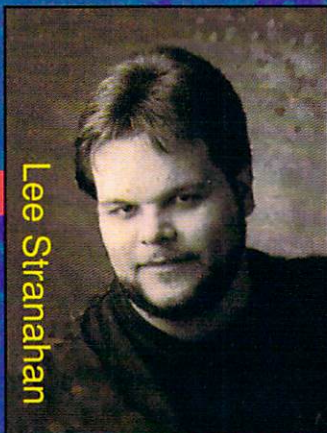
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DR. VIDEO

Got the Jitters?

Probing Panasonic's AG 1960

By Rick Lehtinen



The Doctor will begin this month's column by telling a story about himself. Panasonic recently asked me to give a series of presentations about desktop video in a road show called the Desktop Video Showcase. While at a stop in Bethesda, Md., some of the showcase partners were having a hard time getting their monitors to look good. It seemed that every now and then, the monitors would go blurry and start to roll and flicker.

If you've been following this column, you can guess that the good Doctor did an on-the-spot diagnosis of ground-loop-itis. Ground loops occur when you feed a video system from more than one power source, and those sources have slightly different ground potentials. When this occurs, small unwanted currents can cause distortions in video and audio equipment. In the



Bethesda case, the problem was so bad that the exhibitors finally gave up and moved their tables out to the foyer.

Full of my own steam, I walked over to the part of the room they had abandoned and found my evidence. Extension cords feeding the tables had come from two different corners of the room. I was so sure a ground loop was the cause of the problem, that I dared the local expert to measure the voltage difference between the ground pins on the extension cords.

Pride goeth before the fall. The next morning, the building engineer was following up on the problem. He entered the ballroom, looked once, and said, "Oh, *that* wall! You can never get a picture monitor to work near that wall."

It seems that the monitors weren't reacting to any ground loops. The distortion we were seeing was caused by the Washington Metro subway which had a stop adjacent to the hotel. We could have fed the video systems from wherever we wanted without effect—the distortions

were actually caused by the massive magnetic fields emanating from the slow moving, electrically powered trains. Oops.

Q: I sometimes see a small amount of jitter in the center portion of the screen with my videotapes. I use three Panasonic AG-1960 decks, two as sources and one for recording. These are routed to the Toaster through a Kitchen Sync TBC. When I view the tapes directly off the camcorder, there is just a tiny jitter, but by the time I create the edited master, the jitter is much more pronounced.

When I copy the edited master for my customers, it is very noticeable. I have swapped tape machines around, and the problem remains. I have also noticed that sometimes a recorded Toaster framestore has the jitters and other times it doesn't. What am I doing wrong?

T.L.

Lugoff, S.C.

Rx: It sounds to me as if you're doing everything right. The troubleshooting path you describe exonerates several common points of failure. Here are four things to try:

- Try a different monitor to view your tapes. Monitor faults have caused many video engineers to go gray from looking in the wrong place for the problem.
- If you can do it, borrow a higher-priced record deck for awhile to exonerate the decks. The model you mention is good, but older. (In video, older means paid for last week.) The AG-1970, for instance, has a simple TBC included. (However, according to NewTek Tech Support, it's not enough of a TBC to satisfy the Toaster). The 1970-H series, which will soon be available, has a fairly elaborate built-in TBC.
- Remember that the playback of your record machine is not time-base corrected. What you are seeing on the monitor may in fact be uncorrected time-base errors from the deck.
- You might even want to try dropping in a different Toaster for long enough to rule it out as a source of trouble.

Let me know how this helps.

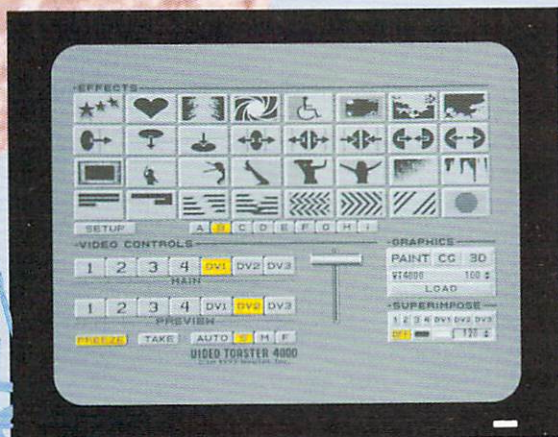
Q: I have an Amiga 1200 that I create graphics on. I record them on a Panasonic AG-1960. When I play it back, I see some jitter in the picture. I have tried a TBC, without success. Would a deck with a built-in TBC help?

G.S.

Staten Island, N.Y.

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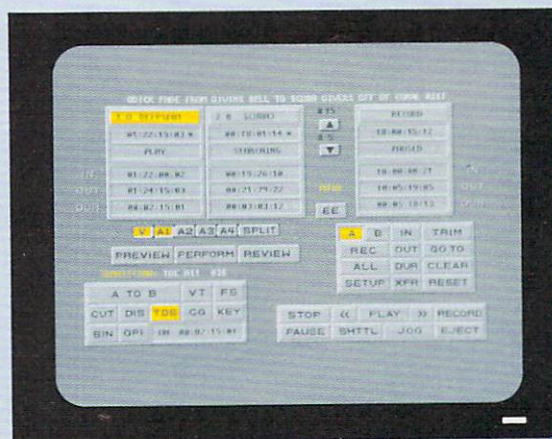


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DR. VIDEO

Rx: Because of the similarity of your problem to the previous one, I made a few phone calls. There is no history of Toaster trouble with the 1960, but a surprising number of users apparently either miswire their systems or have their TBCs incorrectly set.

As to the former, I encourage users to give the equipment manuals just one more try before wiring things up the way they think it should be. It is true that some manuals are poorly written, but most are not. If the book is unclear, bug your dealer or the manufacturer's technical support staff for help. (Expect to spend a lot of time on hold. You might consider faxing your query and following up with a phone call. This gives you a chance to get on with your life while awaiting a reply.)

As for TBC adjustments, I have used TBCs and frame syncs for years, but still I would hesitate to set the TBC proc amp controls (black level, white level, chroma level, etc.) without a waveform monitor nearby. It is easy to tweak yourself into trouble. A good eye is no substitute for the right instrumentation.

Q: Please explain again how many terminators I need to go from my videotape recorder to my Toaster. I am using a TBC card mounted in an unused slot in my Amiga 2000.

D.C.
Atlanta

Rx: You need a *terminator*, a precision 75-ohm resistor mounted in a BNC fitting, at the end of every video cable. Some devices build the terminators in, so you don't see them, but they are there.

In your case, there will be a line from the VTR to the TBC input, and it must be terminated; there will be another line from the TBC output to the Toaster input, and it must be terminated. Finally, there will be a line from the Toaster output to the record VTR input. It must also be terminated. Some of these terminations may be built-in. In this case, the line is *single-ended*. Others may be switchable or require you to install a terminator.

If you do not use a terminator, the picture will appear washed-out. The whites will be screaming bright and

devoid of detail, and the darks will be gray. If you somehow have more than one terminator in a given line, the whites will appear gray, and the darks will appear deep-black.

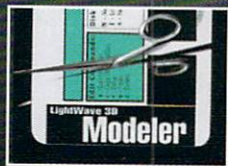
Q: I have a video editing system consisting of a Sony PVW 2800, 2650 and 2600, using the Toaster with AmiLink Pro. The system will not match-frame edit correctly. The image shifts horizontally, and sometimes the black level varies maybe 4 IRE. This has persisted for months and is costing me time, money and what little is left of my sanity. I have used two different PVW 2800s, and they both do the same thing. Help!

W.B.
Seattle

Rx: Help should have arrived in this issue and the last one. Look back over the "ABCs of Video" series, part V, which dealt with Toaster timing for H phase, and part VI this month, which explains not only subcarrier phase, but also problems such as the one you are seeing.

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DR. VIDEO

Q: I have a Toaster 4000 running on an Amiga 2000 and a fast 486 EISA PC, which is soon to be upgraded to Pentium. Can I somehow offload the intensive rendering calculations from my Amiga to my PC and back again? What is needed to do this?

E.S.

Los Alamos, N.M.

Rx: What you are describing is the root of the NewTek Screamer. The Screamer is equipped with four RISC processors that divide the calculations and speed them back to the Amiga. At this time, however, you do not build a Screamer, you buy it. So we need to look for other answers.

You can increase rendering throughput by speeding up your 2000 with one of several fine accelerator boards available today. This approach has the further advantage of keeping you in card slots, which the 2000 has many of and the 4000 seriously needs.

A recent buzz was that a software product called LightRave from Warm & Fuzzy Logic allowed any Amiga to host

LightWave without the Toaster. The theory was that one could buy LightWave upgrades from NewTek and install them on a barnyard full of cheap Amigas. A network would pass the files between the Toaster and the renderers.

In actuality, what this product may have accomplished may have been massive LightWave rip-offs. You see, the Toaster is a *dongle*, that is, a hardware key. Program segments look for hidden codes in the Toaster board. If the codes match, the platform is valid, and the software proceeds. If the codes indicate something is fishy, the work stops. What this rendering product apparently accomplished was not so much a triumph of technology, but actually a code cracking. It fooled LightWave into thinking that a Toaster was at home. The danger was that someone could distribute illegal copies of LightWave, which would run on Toasterless Amigas, cutting NewTek out of the loop.

Which gets us back to the Screamer. Assuming you started with the low price of \$500 dollars per Amiga, you

would still end up with less than half of the Screamer's rendering power by the time you equaled the Screamer's price.

Q: In the June/July issue, you mentioned that the Video Toaster could be used as a live switching device. I'd like to find out a bit more about this.

T.D.

Miami

Rx: Live switching is far easier than match frame editing. You just run wires to all the sources to genlock them and wires from all the sources to feed them to the Toaster. The source with the horizontal and color phase controls that are hardest to work with goes to video input one. You adjust the rest of the sources so that they match in time.

Of course, there is just a little more to the story than that. Live switching and multi-camera operations will be covered in next month's "ABCs of Video."

VTU

[Editor's note: NewTek said the Screamer is scheduled to ship in the first quarter of 1994.]

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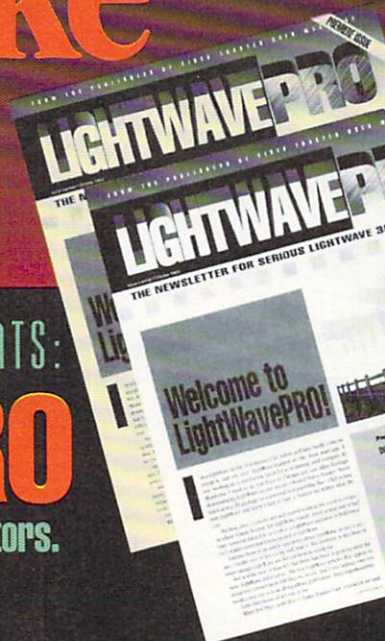
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SOUND REASONING

The Basics of Audio Consoles

Understanding the Ins and Outs of Mixers

By Cliff Roth



A

good-quality, basic audio mixer is one of the soundest investments you can make for your desktop production setup. Unlike video equipment, which tends to become antiquated after five or (at most) 10 years, audio gear tends to last and last. The mixer is the nerve center of the audio system—it's where all the available signals get selected and combined.

Precisely what the mixer mixes depends on the project and whether you're using it in the production or post-production phase. Most mixers are versatile enough to work for both laying original tracks and for editing—though most low-budget video productions use them more for the editing.

When shooting video, an audio mixer is primarily useful for combining two or more microphone signals. This need crops up with interviews, panel discussions, and live-music shoots.

For post-production, the mixer lets you combine the original audio on the camcorder videocassettes with recorded music from CDs and tapes, sound effects, wild (non-synchronized) sound recordings, announcer

Inputs, Outputs

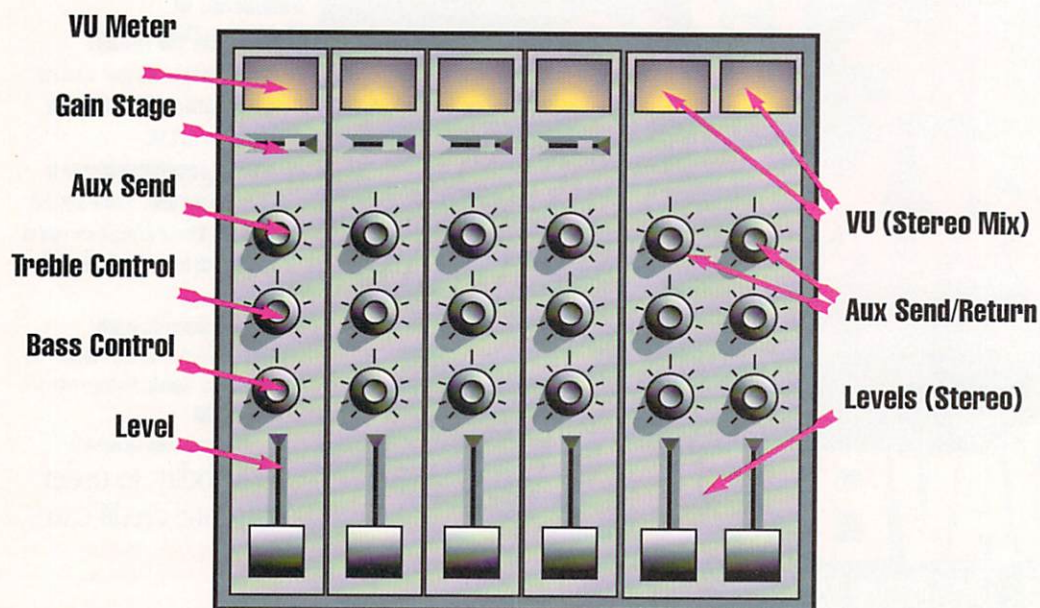
The most basic mixer capabilities can be described generically by the number of inputs and outputs the mixer has. An 8 x 2, for example, has eight inputs and two outputs. Unless stated otherwise, you can generally assume that the inputs are monaural (single-channel), and that the two outputs represent the left and right channels of what might be thought of as a single stereo signal. Since the inputs are mono, feeding a stereo signal, such as from a CD player or cassette deck, will require the use of two input channels. An eight-input unit can thus combine up to four stereo signals.

Eight microphones could also be plugged into an 8 x 2, assuming it has the appropriate input jacks. Semi-pro and professional mixers offer low-noise, balanced-line, three-pin, XLR microphone jacks (also known as Cannon connectors)—an absolute necessity for microphone mixing. These jacks offer a distinct advantage over the cheaper, lower-quality, and noisier mini-jacks found on most computer multimedia audio inputs. (We'll look at computer software audio

mixing—as opposed to the traditional analog mixers discussed here—in a future column.)

Most mixers offer a switch that chooses between a microphone jack and a line-input jack for each input channel. Some offer special phono inputs intended for use with turntables. The more things you can leave connected to a mixer without having to plug things in and out, the more time you'll save and the less wear there will be on the jacks. Professional mixing consoles used in recording studios offer built-in patchbays to facilitate quick changes in the connections.

Intended for use in discos, stereo mixers are set up so that a single fader simultaneously controls both left and right signals. For video applications, however, these mixers are generally less versatile than the music/recording studio



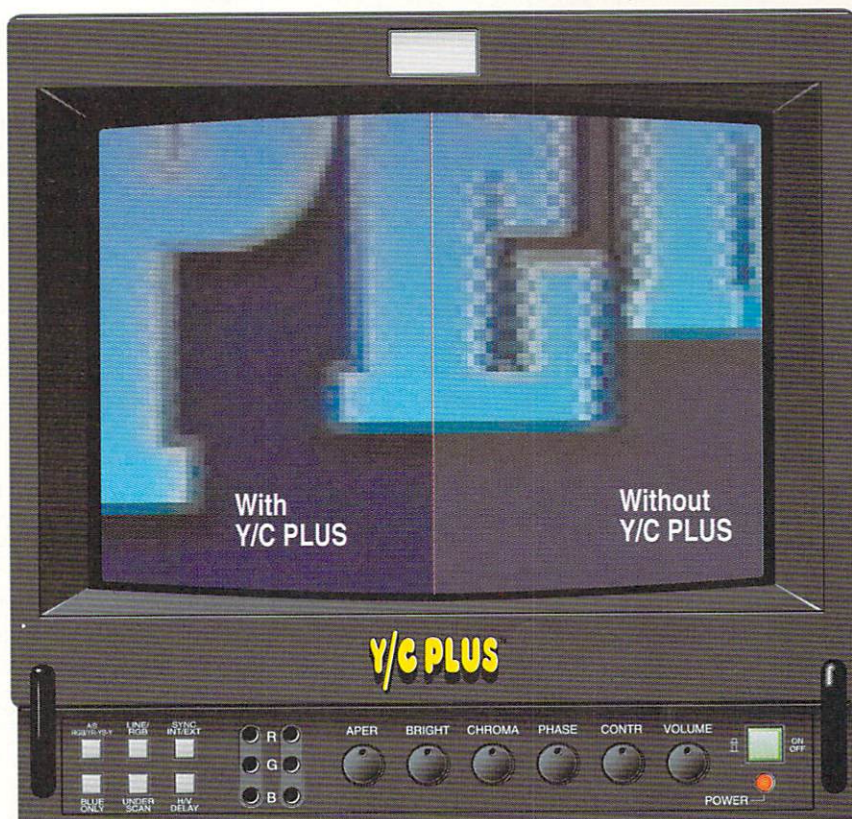
voice-overs, and background ambience tracks (such as room tone, street noise, forest sounds, surf, etc.). The mixer can also shape each individual sound element by tweaking tonal characteristics and adding special effects like reverb.

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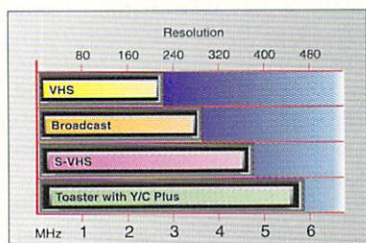
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SOUND REASONING

mixers—even if it means using many inputs in pairs.

The most sophisticated mixers, intended for use with multitrack recording and complex music mixing, are commonly described as having three sets of numbers, such as 32 x 24 x 2. These are designed for use with a 24-track tape recorder. First, during the laying of the tracks, up to 32 inputs can be combined in practically any combination onto the 24 tracks. Usually, each microphone gets its own track so that decisions about mixing can be put off until later. Then, during the mix-down, the 24 tracks are combined together, along with effects like reverb, flanging and harmonizing to create the final (two-channel) stereo mix. In audio engineering jargon, the 24 intermediate outputs are called busses or submasters.

Equalization

Equalization (EQ) is engineering parlance for tone controls, which are generally found on each input channel of a good mixer. The EQ controls are

similar to the treble and bass controls found on a stereo system, but the audio spectrum is usually divided into a larger number of ranges (bass, mid-range, and treble; or bass, low-mid, upper-mid, and treble), and the degree of control is usually more flexible and precise.

Better mixers can independently vary both the center frequency that will be affected and the degree of boost or cut that is desired. The best mixer EQs also let you vary the bandwidth around the center frequency that will be affected (this feature is called "variable EQ").

In professional recording studios, EQ is used to make each ingredient of a multitrack mix sound its absolute best. In low-budget video applications, EQ can be extremely useful for eliminating noise problems like hum, or for making semi-intelligible speech sound clearer on problem recordings.

Sends and Receives

Better mixers offer a set of auxiliary outputs, called sends, that are useful

for hooking up outboard effects devices like reverb. The sends are most effective in situations where several different inputs all need to use the same effect, such as several microphones needing reverb. Mixers that offer sends have individual send-level controls built into each input channel. One microphone might send a large signal level to the reverb, while another sends a smaller amount.

The mixer has a separate output jack for each send, and these jacks get connected to the effects unit. In other words, one (or two for stereo) of the mixer's send outputs is (are) connected to the input(s) of the reverb.

The output of the reverb is then brought back into the mixer through another ordinary mixer input channel; or, if none are available, through a special auxiliary input called, appropriately enough, a receive input. Note that whereas the number of available sends is a very important measure of the sophistication of an audio mixer, the number of receives is not that important because you can use ordinary input channels instead. With a 32 x 24 x 2 mixer, during mix-down of the 24 tracks there are eight extra inputs left over to bring in signals from outboard processing gear.

Besides reverb, other commonly used special effects include the harmonizer (pitch change), echo, delay, envelope modification, chorus, flanger, phase shifter and compressor. Note that some other effects, like the noise gate, are generally applied to just a single signal at a time, and therefore don't require a send. In the old days of analog, each of these effects required a separate piece of equipment; nowadays, digital sound processing effects units can perform all these functions, albeit only one effect at a time.

Meters and Monitors

VU meters measure volume units—a relative measurement of loudness. They're essential for setting mixer levels so you get the cleanest possible recordings with the strongest possible signal level that doesn't distort.

Higher-priced mixers offer a separate VU meter for each submaster channel, as well as meters for the final stereo or mono output signal(s). A modest 8 x 4 x 2 mixer, intended for

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use with a four-track tape deck, will offer four meters for the input signals, for example.

Less-expensive mixers tend to only offer meters for the outputs. This is one drawback of those used in discos. Having individual meters for each input channel is an absolute must for multitrack recording because it ensures proper recording levels.

For mixing low-budget videos, these input meters are a useful luxury, but not an absolute necessity. They can help you spot missing or noise-plagued signals.

All but the cheapest mixers offer VU meters for the output level: one for mono, two for stereo. To use these effectively, it is crucial that the mixer's meters be calibrated to the recording VCR's audio, record-level meters. When the output meter on the mixer reads 0-VU, the record level meter on the VCR should also read 0-VU. You can adjust the VCR's record level to get them in proper calibration.

Some mixers offer a choice of VU or peak-level metering. The peak meters, which are always made from display lights (as opposed to a mechanical meter movement), show the highest level reached, even if it lasts for just one-thousandth of a second. The VU meters are more sluggish in their response (due to mechanics, originally, and circuitry that duplicates those mechanics in electronic displays) and thus tend to ignore very short-lived transients and show a more averaged-out level. Both indications are useful. The best mixers can display either.

The meters provide a visual indication of the audio signals passing through the mixer; but, of course, you want to be able to hear these signals also. That's where the mixer's monitor section comes in.

On less-expensive models, the monitor section may consist simply of a headphone jack with its own level control. More sophisticated ones generally offer separate monitor-line output jacks, intended for hookup to a stereo amplifier and monitor speakers (or powered speakers). A separate monitor-level control lets you adjust your listening level from the mixer, without affecting any recording levels.

The fanciest mixers used in professional recording studios offer a sepa-

rate monitor mix level for each input channel. In principle, this is similar to the way the sends work. If you're recording a rock band, for example, the separate monitor mix can allow the producer to focus on listening to the vocals during recording, with most of the instruments mixed low.

The Final Mix

Mixing audio is a bit like cooking—you need to start with good ingredients for the final dish to taste great. The mixer is a tool for optimizing the audio ingredients and combining them with enough control that they don't overpower each other. Even a simple project like combining voice-over narration with recorded music can benefit from a good mixer.

All mixers add a slight bit of noise to the signals they're combining. The best models keep this to an absolute, inaudible minimum, while cheaper models may add a noticeable hiss or buzz. The more circuitry that stands between the original signal and the mixer's output, the more noise that

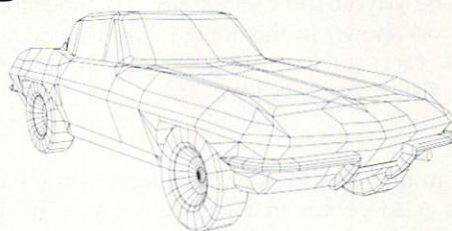
gets added. That's why the best mixers often offer in/out switches that can take an entire set of circuitry (such as the EQ section) out of the signal path if it's not needed.

Just as most professional videographers shooting with a camcorder tend to leave the editing decisions until later (preferring to get as much coverage during the shooting phase as possible), most professional recording engineers opt to leave the mixing until later. Ideally, each sound element is recorded separately, without any effects, so that all the decisions about mixing, EQ and reverb can be made later when things are less hectic.

This, in a nutshell, is the advantage of mixing music, narration, and sound effects into your video production during the editing, rather the shooting, phase. You get more control, a calmer environment and can take your time before deciding on all the adjustments for the final mix.

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TAMING THE WAVE

Boolean Operations Part II

Building a Slot Machine

By David Hopkins



A

s you may recall, in January we got about halfway through building a slot machine in Modeler with the help of Boolean operations.

Last month I explained how to build the main body of the slot machine. This month, I'll teach you how to begin hacking away at the parts of our basic form that are not a slot machine.

Enter LightWave and Clear the Scene, then enter Modeler and click New. Make sure that Modeler is working in LightWave's version of Metric by going into the Display menu, clicking Options, then clicking SI under Unit System. Load the SlotMachineRev1.lwo object, which we saved at the end of last month's column, into Modeler's Layer 1.

top of the machine, so let's scoot it down a little bit.

From the Modify menu, click Move. In the view marked Face, click and drag the box down 2 inches. Check the coordinate display to make sure you move only on the Y axis. Now we'll angle it. You should be in the Points Select Mode along the bottom of the screen. In the view marked Left, click the point sitting in the upper right corner of the box. This will actually select two points, both of those along the rear top of the box. Choose Move again from the Modify menu and move the points to the left 5 inches. The coordinate display should read Z-5 when everything's correct.

Click the Points Select Mode again to switch out of the Move function. Press the / key to deselect those

two points. Now we want to select from the Left view the point in the lower-left corner of the box. You should have two points selected again. Drag these down 10 inches (Y-10). Deselect the points by clicking Points Select Mode and then / again.

Before You Start

To complete this tutorial on building a slot machine with the help of Boolean operations, you'll need to create a payoff scorecard similar to the one that my assistant Tony Rizo created (pictured).

The Payoff scorecard is that portion of the slot machine that sits above the dials and explains the payoff for various slot machine combinations. Try to duplicate the scorecard shown in this image. Use DeluxePaint in the 16-color high-resolution mode (or a similar paint program) and save the final version in your Images drawer. Call it SlotPayoffChart.16.

	1ST COIN	2ND COIN	3RD COIN	4TH COIN	5TH COIN
ANY TWO 2-4-6-8	200	500	1000	1500	2000
ANY TWO 1-2-3-4-5-6-7-8-9-10	50	100	150	200	250
ANY TWO 1-2-3-4-5-6-7-8-9-10	20	40	60	80	100
ANY TWO 1-2-3-4-5-6-7-8-9-10	20	40	60	80	100
ANY TWO 1-2-3-4-5-6-7-8-9-10	10	20	30	40	50
ANY TWO 1-2-3-4-5-6-7-8-9-10	5	10	15	20	25
ANY TWO 1-2-3-4-5-6-7-8-9-10	5	10	15	20	25
ANY TWO 1-2-3-4-5-6-7-8-9-10	2	4	6	8	10

Large and Small Slopes

The large slope we made will be the payoff chart, while the smaller slope will contain the actual slot wheels. In Polygon Select Mode, click on the steep slope in the Left view. This selects more polygons than we want, but we can remove the others by clicking on the smaller slope in the same view.

The Polygon Count at the bottom of the screen should read 1. From the Polygon menu, choose Surface and type

in PayoffChart and hit Return. Press the / key to deselect that polygon, then click on the smaller slope in the Left view. Deselect the extras by clicking on the larger slope in the same view. Again, make sure that the Polygon Count at the bottom of the screen reads 1. Choose Surface again and this time type in WheelDisplay. Hit return. Press the / key to deselect the polygon.

Now, press the W key. This will bring up the Polygon Statistics for the current layer. Towards the bottom you'll find a pop-up button that should say Default. If it doesn't, simply click and hold down your mouse button over the pop-up button and select the name Default. Click the + button just above and to the left of the pop-up and all of the polygons in this layer named Default will be selected. You should get four of them. Choose Surface again from the Polygon menu and use this pop-up button to select the surface name SlotMachineBody, then click Apply.

Put layer 2 in the foreground and layer 1 in the background. Press A to center in all three views. The first cut to make will be the Payoff Chart. It sits very near the top of the machine and slants back into the case.

Choose Box from the Objects menu. Click Numeric and set the fields like this: Low X = -1.5, High X = 1.5, Low Y = 3, High Y = 5, Low Z = 0, High Z = .85. Set Segments to 1, and Units to Feet. Click OK. You'll see your new box in white over our slot machine shape.

Where did these numbers come from? Well, we want to map an image into the area we are about to cut out for the payoff chart. We also know that the normal aspect ratio for an NTSC image (a.k.a. your Payoff Chart) is three units wide by two units high. Hence the total X measurement of the new box is three and the total Y measurement is two. The .85 on Z is simply to give us depth for cutting into the slot machine. Your box should rise just over the

TAMING THE WAVE

Let's scoot our cutter to the front of the machine now so that we can prepare for the Boolean operation itself. Click Move, and in the Left view again, drag the entire box over to the left until $Z = -2$ (feet). Your screen should look something like Figure 1.

Press the ' key to swap foreground and background layers. Now press Shift-B to bring up the Boolean options. Make sure that Subtract is selected and click OK. You should be in Points Select Mode, press M and click OK to Merge Points. Save the foreground layer as SlotMachineRev2.lwob. According to LightWave, our slot machine now looks like Figure 2. Note that the two different colors inside the machine represent the surfaces we'll be mapping onto later.

Making the Tray

Now we need to make a tray for the slot machine. Go to layer 2 and click Cut at the bottom of the screen to remove the cutter. Return to layer 1. Go to Points Select Mode and then, in the Left view, use the right mouse button to drag a lasso around the points located in the bottom left corner. You should get 14 points. Click Copy, go to layer 2 and click Paste. Press the A key to fit these points in all three views. If you click and drag on the intersection of the three (well, four) views in Modeler, you can change their shape. Drag your intersection to look like Figure 3.

In the Top view, select the two points at the upper ends of the point curves. From the Multiply menu, click Mirror and place the mirror horizontally across the Top view at $Z = -1'2$, then click on Make. Place your pointer in the Top view and click the up arrow on your keyboard to scoot your view upward. You should be able to see the two new points you made after just one or two presses.

Still in Points Select Mode, select all the points you can see in the Top view in a clockwise direction, click P to make a polygon. We've just built the base of the payoff tray, but it needs to be a little thinner.

Put layer 1 in the background. Go back to Points Select Mode and drag a lasso with the right mouse button around the points on the left half of the Top view; you should get 8 points. Change to Move from the Modify menu and drag those points to the right in the Top view until $X = 2$ ". Press the / key to

deselect those points, drag a lasso around the points on the right side of the top view (8 again) and Move them to the left in the Top view until $X = -2$ ".

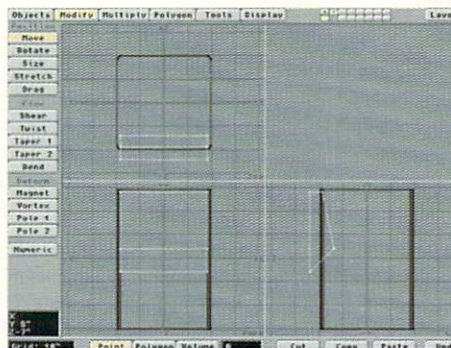


Figure 1



Figure 2

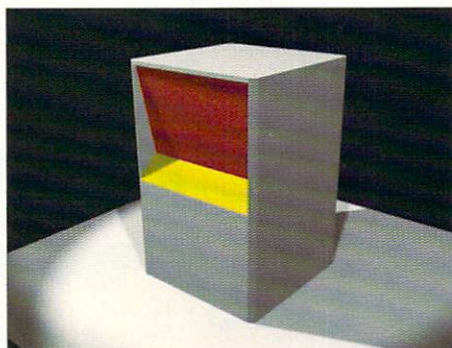


Figure 3

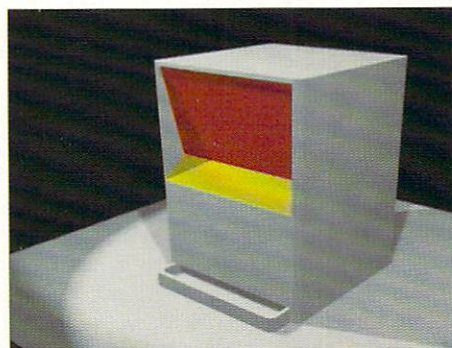


Figure 4

When you have done this, shift to Polygon Select Mode and then click Copy, go to layer 3, and then Paste.

Now height must be added to the tray. From the Multiply menu, choose Extrude and then Numeric. Make sure that the Units are Inches, and the Axis is Y. Set the Segments to 1 and the Extent to 4, then click OK and Make. Press the F key to Flip the polygons since the extruded shape is inside out. How did we find out that it is inside out? Just click on any edge of the shape to select a polygon and look which way its normal faces. The normal is the little dotted line. Make sure no polygons or points are selected, then choose Surface from the Polygon menu and choose the Slot Machine Body from the pop-up list and hit return.

Here comes a nifty part. Move the new shape down in the Top view until $Z = -5$ ". This pulls the tray a little out from the machine. Put layer 1 (where your slot machine is) in foreground and select layer 3 as background. Press Shift-B to get the Boolean options, choose Subtract, and then OK. Our tray has just cut a slot into the base of the machine. Now we'll use the tray to make a better one.

Make sure that nothing is selected and then Copy, go to layer 4, and Paste. Put layer 3 in the background. From the Modify menu, click Stretch, then Numeric. Set the X and Z factors to .95. Leave Y at 1. Click OK. From the Modify menu, click Move and scoot the smaller version up in the Face view until $Y = 1$ ". Press the ' key to swap the layers. Put 3 in the foreground and 4 in the background. Press Shift-B to bring up the Boolean options, set it for Subtract, then click OK. Voila! Now we have a proper coin tray! Put layers 1 and 3 in the foreground, Cut, and then Paste. Make layer 1 foreground and save the object as SlotMachineRev3.lwob.

This is where we are going to stop for this installment. You can see in Figure 4 how far we've gotten. With luck, we'll be able to finish off this object in the next issue. I want to stress that Booleans are not nearly as complicated as they may seem. In fact, it takes longer to read about the process than it does to perform it.

As usual, if you have any questions, comments, suggestions or even just want to send a copy of your latest demo reel, please feel free to write to me at:

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CYBERSPACE

Image Processing

With Shareware Programs

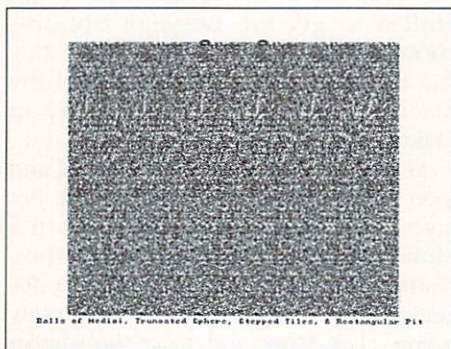
By Geoffrey Williams



In the January issue I wrote about utilities and scripts to use with commercial image processors, but there are also a number of very good shareware image processors available with a wide variety of capabilities. Some of them even have features not available in commercial programs.

Animation

One of the best shareware programs I've come across is Tonny Espeset's Digital Illusions, an image processor and animation utility that the commercial programs could learn from.



SIRDS allows you to make random dot stereograms.



TSMorph creates standard and animated morphs.

The most recent Digital Illusions version adds some powerful new features. The interface is similar to the one used in Art Department Professional, with a screen full of buttons. Most of them are available from this main screen. It won't load HAM-8 images in the version I have (1.47), but it will accept everything from 256 color images to normal HAM and 24-bit images. It loaded Toaster resolution IFF-24 images just fine, and while theoretically it can take images up to 1,024 x 1,024, I had no luck doing this on my machine.

Once the image is loaded, you can choose from many standard image processing functions.

Rendering images to all standard formats is possible, although this version does not support the new AGA color modes. You can render any image into 24-bits for direct loading into the Toaster, or into programs such as Brilliance or Deluxe Paint AGA for creating a Toaster-compatible animation.

Images can be scaled using intelligent antialiasing. There is visual cropping, where a box can be dragged around the area you want and displays both

the x and y location of the pointer and the size of the cropped image. You can adjust the brightness, the red, green, and blue intensities, and convert the image to gray, negative, line art or an emboss. Images can also be flipped horizontally and vertically. Some of the more unusual effects include Stars, which lets you put star highlights anywhere on the image, and Random Shade, which randomly changes the image's color.

The real power of this program, though, is in its animation capabilities. Creating an animation is easier in this than in any other image processing program I have worked with. You choose the image processing settings you want for the first frame, the number of frames and the image processing settings for the last frame. All of the in-between images are created automatically.

Line Art, Brightness and Emboss are the only processes from above that can be animated, but there are many others that work especially well with animation. Starburst adds star highlights based on adjustable area brightness levels. Splatter adds random pixels from one to 10,000. Spiral twirls the image from zero to 1,440 degrees. Mosaic creates a blocky effect with adjustable block size from zero to 100 (a single, full-screen pixel). Motion Blur lets you set the angle and distance. Metamorphosis can composite two images with a mixing level of zero to 100. Explode blows up the entire image into separate pixels, which is helpful only when using it for animation.

There are also a number of wave and quake effects. Horizontal Quake distorts the horizontal lines and Vertical Quake randomly warps the vertical lines of an image with a defined radius. Horizontal Wave generates smooth horizontal waves and Vertical Wave produces smooth vertical waves with a given radius, frequency and offset. Horizontal Depth Wave makes the image look like it's been held underwater with horizontal waves above, while Vertical Depth Wave does the same vertically. Horizontal Shade Wave produces horizontal waves with shades while Vertical Shade Wave does the same vertically.

Any of these processes can be combined when creating an animation. Some of them work even better when combined with others, such as using the Vertical Wave with the Vertical Shade Wave. Motion Blur can be turned on too. Settings can be saved and the current Digital Illusions provides some as well.

One of the more interesting is called DItoDust that combines horizontal and vertical waves to make it appear as if the image is being blown apart into

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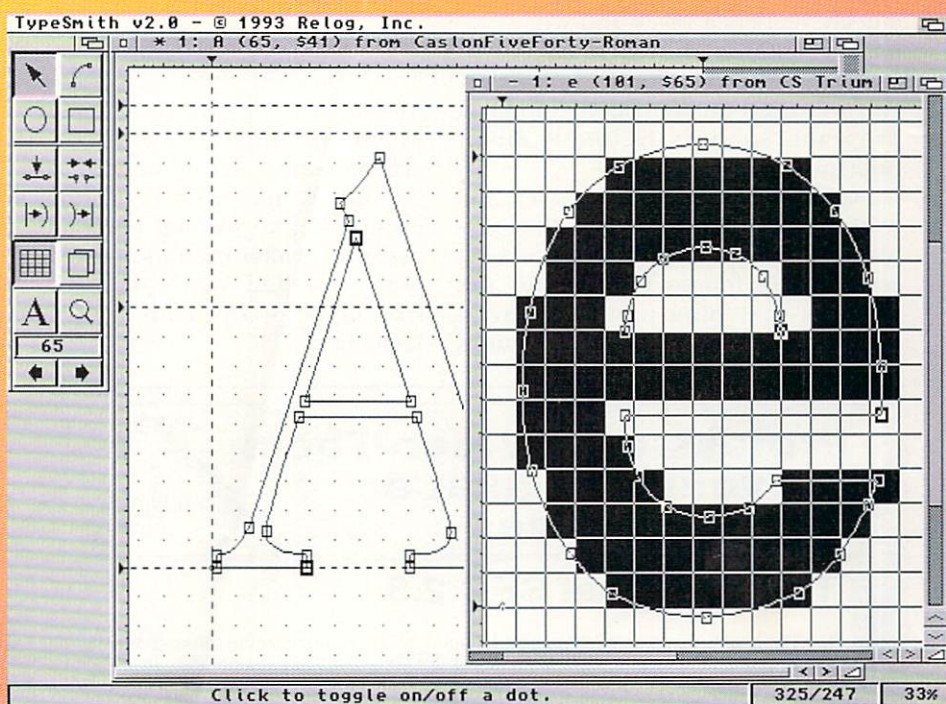
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swirling dust. This is an awesome effect with text. Another setting is Explosion, which uses the Explode operation in combination with decreasing brightness to make the entire screen blow apart into decaying pixels. There are several others, and you'll have great fun trying them out, and of course, you can make your own.

After an animation is created, you can preview it by playing it directly off the disk (although playback is about a frame per second, and can't be used with 24-bit images). You can also create fast previews by setting the rendering mode to Preview, which quickly renders a black-and-white animation without the optional Floyd-Steinberg dithering. For final playback, you will need an animation compiling program, such as DeluxePaint or Brilliance.

Digital Illusions multitasks well and works great. It also comes with a simple utility that lets you reverse a sequence of frames for creating animations that ping-pong or run in reverse. There are many great features

promised for version 2.0, so you would be well advised to send in the modest shareware fee.

Morphing

The best capability in image processing is the ability to create animated morphs of one object into another. Believe it or not, there is a freely dis-

"Creating an animation is easier in this than in any other image processing program I have worked with."

tributable morphing program. Its not as fast or easy to use like the commercial programs, but it will generate 24-bit frames and even do ARExx processing before loading each file, and before and after each morph. The program is called TSMorph and comes from a company called Topicsave Limited.

To use it, you will need two versions of your beginning and ending frames. One version is the original full 24-bit image, the second is a version in the same number of colors as on your Workbench screen. TSMorph uses the second as a display version that lets you set the points for creating your morph. You can use Digital Illusions or any image processor to create this second image.

TSMorph creates both standard morphs from one image to another, as well as animated morphs in which each frame is different. You can also distort a single image through warping.

Like most morphing programs, in TSMorph you place control points to outline the object you want to morph. Identical control points are automatically added to the second image (they should be adjusted to match its outline). The two are both in scalable windows; they can fill the screen or sit side by side.

Once the control points are adjusted, set the number of frames and the animation filename. You can adjust how each frame will be sequentially numbered as well as setting the starting frame number so that you could make several sequential morphs.

TSMorph-Render is a companion program that performs the actual rendering. The program displays a gauge to show the progress of each frame, an indicator for the total rendering time for the previous frame, and the current frame number. The rendering speed is not great (a Toaster resolution image with about 20 points took about six minutes per frame on my 50 MHz '030), but the quality is reasonable.

A well-implemented feature is the on-line help using AmigaGuide. Hold the pointer over any gadget or menu item and press the help key, and you'll see context-sensitive help screens. The entire manual is also in AmigaGuide format (a Commodore standard for interactive help and hypertext documents. It requires that you have the AmigaGuide.library installed, and either the AmigaGuide text or compatible file reader for Workbench 2.1, or MultiView for Workbench 3.0. Unless you have an older system, these should already be installed).

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CYBERSPACE

Traditional Image Processing

Unfortunately, I was unable to find a program that could load IFF24 images and do a wide range of traditional image processing. Since there is still a lot of clip art and imagery available in the standard Amiga resolutions, Gary Milliorn's ImageLab can still be useful. It does not support 24-bit or AGA, but will handle all other Amiga image formats.

The program comes with on-line help, and most of the features can be accessed through menus and keyboard shortcuts. ImageLab also permits the user to select a region of the image to apply the processing to.

The documentation is very good; one advantage is it helps users gain a better understanding of what many standard image processing functions do. ImageLab does a wide variety of pixel averaging, including a custom matrix editor. It has many color conversion options, such as grayscale, negative, saturate, pseudo color, color to black and white, linearize, map colors, and delete colors. It also has a customizable convolution matrix with settings for smooth, sharpen, laplacian, vertical and horizontal edge, and high and low frequency. There are several filters, such as Sobel, Roberts, binary, threshold, pixelize, minimum, median, maximum, distort, and noise. It has extensive FFT (Fast Fourier Transform) options. You can also merge one image with another, with overlay, add, subtract, and, or, xor options. There is even a draw function with a tool bar that lets you do some image processing by drawing directly on-screen.

ImageLab is an interesting program, and by reading the manual, using the interactive help, and trying out the different options, you'll learn quite a bit about image processing. Even though its utility is limited because it does not manipulate 24-bit images, it is still worth a look.

3D without Glasses

If you've recently wandered into a store that sells color prints, you may have seen an interesting form of optical illusion that creates a 3D stereographic image. At first, the entire picture looks like random noise, but if you look at it in the right way, a 3D image suddenly appears. It's quite

startling when you see it—an emphatic 3D effect.

Thanks to a splendid utility by Ross Fuller called SIRDS, you can make your own random dot stereograms. Using a paint program, it is possible to create several objects in different colors on-screen. SIRDS image processes the picture into what looks like a jumble of

"TSMorph creates both standard morphs from one image to another, as well as animated morphs in which each frame is different."

dots. Amazingly, though, if you look at it as described in the instructions, the images will appear to jump off the screen in three dimensions, with the depth of each object determined by their color value in the original image.

The instructions state the image is easier to view when printed, but I thought the effect looked even better

on-screen. For some people, it takes more time to see the image than others; but once seen, your eyes lock on to it. And even when you move around, it remains three dimensional.

Random dot stereograms are more a novelty than anything practical, but you can use the Toaster to dump them to video. Large areas rather than fine detail are easier to see as video adds a lot of artifacting. You could key over the original image and fade it out, showing the viewer what they are trying to see. This might help make the 3D effect easier to perceive. Truthfully, though, you'll probably never use it for anything other than to amaze and amuse yourself.

VTU

You can find the utilities covered this month by contacting private and commercial computer bulletin boards. For your convenience, I've put them all on a disk, which you can get by sending \$5 to Geoffrey Williams, VTU Image Process Disk Offer, 1833 Verdugo Vista Dr., Glendale, CA 91208.

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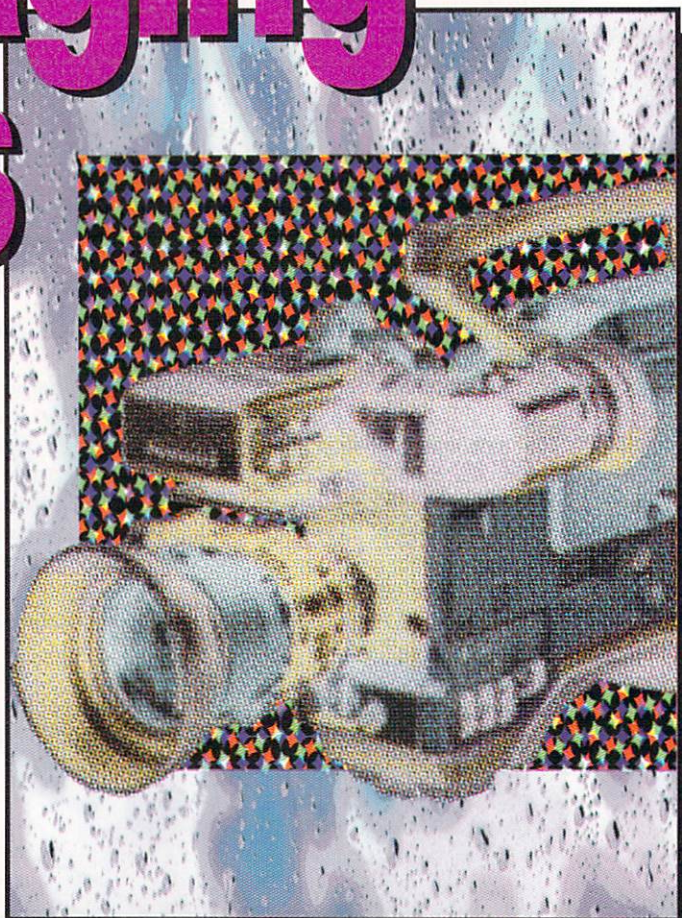
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How to Capture the Best Image and Sound:

The Imaging Process

By Cecil Smith



[Editor's note: This is the second installment of a four-part series of articles about getting the highest quality images and sound through your system. Last month, Smith discussed matching the lens to the desired scene. This month, he dives into the processes that go on inside the camera to convert the scene information into useable electrical signals.]

When picking up a video camera, you probably don't think a lot about the electronics inside that make the pretty pictures you record. But you should.

Understanding how a camera operates internally and relating that knowledge to setting up your camera for a

given scene will give you confidence that your video will live up to your expectations about its technical quality.

Before getting started, you should understand the ground rules of this article. When I refer to the electronics of a camera, the word *camera* pertains to both a standalone camera and a camcorder.

When thinking about the operation of a television camera, it helps if you mentally divide the camera in two. Think about it in terms of the processing of the generated video signal and the synchronization of the operation of circuits within the camera.

The video signal must be created and processed with adherence to strict voltage standards. The operation of the circuits creating and pro-

cessing the video signal must be timed together so other pieces of equipment can decode the signal into a usable picture.

Television Standards

Objects in a focused scene are rarely stationary. To convey the motion, television uses the old film technique of rapidly sensing a series of complete pictures or *frames*. In North America, 29.97 of these frames are sensed each second. Outside North America, depending on the country and its official video standard, you may find 25 or 30 frames per second.

Each frame of the focused scene is sliced into horizontal strips or lines. In North America, 525 strips are used to

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The Imaging Process

form a complete picture or frame. Outside North America, depending on the country, you may find 625 strips. Most high-definition television systems use 1,125 strips to form a frame.

These strips of image are further divided into small picture elements or *pixels*. The more pixels on a given strip, the finer the image detail that can be seen in the strip or the greater the *horizontal resolution*. With existing popular television systems, between 600 and 800 pixels are usually present in each strip. The greater the number of pixels, the

various types of sync signals that are created by an internal sync generator circuit. Some cameras allow the locking of this internal sync generator to other pieces of equipment through a *genlock* circuit to time the camera into a larger production system with multiple cameras and other video signal sources.

The timing for synchronized shifting of charges is provided by clock pulses supplied by clock circuits. The operation of the clock circuits is synchronized with the operation of other circuits in the camera by pulses from the built-in sync generator chip.

All imaging chips perform the same basic function: They create a pattern of electrical charges in response to the image focused on them and shift these charges out of the chip in a manner that emulates scanning of the image. Each pixel becomes a discrete packet of electrical charge flowing off the chip. The flow of electrical charges will be amplified and processed to become the video signal.

So far, the explanation has pertained only to black-and-white pictures. Adding color is a real challenge. Somehow, the focused scene must be separated into the primary colors used in television systems (red, green and blue), and the brightness of each must be detected. A focused image that passes through a red filter will sense only the brightness of red in the scene; the same is true for green and blue.

To sense all the color in the focused image requires three independent and parallel conversions of the scene to an electrical signal. Sensing the three primary colors requires either three chips (one for each of the primary video colors) looking through a scene-splitting prism or one chip looking through a tiny filter built into the chip.

A few cameras use a variation of this method. They rely on one unfiltered chip to sense the black-and-white (luminance) component and a second chip that is filtered to sense the color (chrominance) component of the scene. When fewer than three chips are used, the filters through which the chip looks can be quite complicated.

Figure 2 shows a typical filter with diagonal stripes of unfiltered, primary color and complementary color (yellow, cyan and magenta) areas. With a known color filtration pattern, a circuit can be designed to route the signal rapidly through the proper color signal processing circuits.

With all other picture quality influences being equal, the more imaging chips that are used in a camera, the more accurate the color rendition of the picture. The primary visual improvement in color quality is in the reproduction of saturated scene colors. Colors will appear more intense in the picture if more chips are used for imaging.

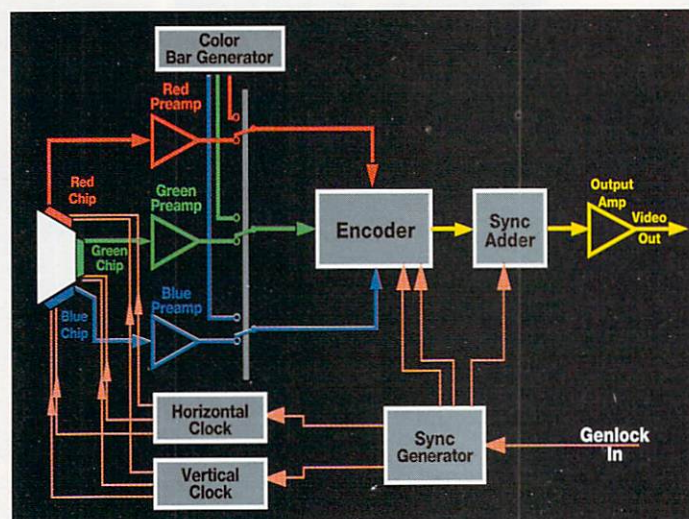


Figure 1

higher the cost of the equipment required to image and process the resulting signal. The pixels in a given horizontal strip are *scanned* one after another from left to right.

Imaging Chips

The first step for the camera's electronics is to convert the focused scene into a weak video signal. This function was once performed by pickup tubes, but special integrated circuit imaging chips, called *charged coupled devices* (CCDs), are used in most of today's cameras. The design of the imaging chips allows them to emulate scanning the scene by shifting electrical charges across the chip in a special pattern, depending on its architecture.

There are three basic chip architectures: frame transfer (FT), interline transfer (IT) and frame-interline transfer (FIT). For most applications, the FT chip has long been replaced by the IT and FIT chips. The relatively low cost of an IT chip allows its use in most cameras in the consumer, prosumer, and industrial markets. The FIT, much higher in cost than the IT chip, is the state-of-the-art in professional imaging applications.

Synchronized timing of the operations that must occur in circuits throughout the camera is critical. Figure 1 shows a block diagram of a typical color television camera. The shifting of charges across a chip must be synchronized so they don't bump into each other and create distortions in the picture. It must be timed to the synchronization information that is later added to the signal so that other pieces of equipment can lock to the signal.

All of these activities are accomplished by referencing

What is Color Temperature?

Color temperature is the temperature (on the Kelvin scale, degrees Celsius + 273.15) to which a perfect black body and vacuum (both of which do not really exist) must be elevated to approximate the spectral characteristics of the light source that is being described. It's like raising the temperature of steel from cool gray to red hot to white hot.

Getting Ready for the Shoot

- **Prepare the scene.**
- **Place the sets, props etc.**
- **Light the scene.**
- **Prepare the equipment.**
- **Set up the camera and allow it to warm up.**
- **Place the microphones and connect them to the mixer or recorder.**
- **On a multi-camera shoot, time the cameras with the H-phase and SC-phase adjustments.**
- **Adjust white balance and black balance (once the lighting is exactly the way it will be during the production).**
- **Check audio levels.**
- **Repack the tape (fast-forward to the tail and rewind to the head) if fresh stock is used.**
- **Make and evaluate a test recording, checking both video and audio.**
- **Record at least 30 seconds of color bars and tone and 15 seconds of black and silence immediately before beginning the production.**

There is also an increase in the amount of color detail that can be seen.

Pre-Amplification

Once the weak video signals are created by the imaging chips, the separated primary color signals are sent to separate pre-amplifier circuits. These circuits provide adjustments for *gain* and *pedestal*. The gain of the individual red, green and blue pre-amplifier circuits is adjusted relative to each other to *white balance* the camera. The pedestal of the individual pre-amplifier circuits is adjusted relative to each other to *black balance* the camera.

White and black balance adjustments are needed to match the response of the camera to that of the human eye. The CCD chips see colors differently than we do. As a light source changes in color temperature, the camera must be readjusted to approximate the eye's response.

White is defined as an equally bright presence of red, green and blue. While the camera is viewing what the eye interprets as being white, the gains of the preamplifier circuits are white balanced for equal amounts of red, green, and blue video signals.

Black is defined as the equal absence of red, green and blue. While the camera is viewing black, the pedestals of the pre-amplifier circuits are black balanced for equal amounts of red, green, and blue video signals. (For technical reasons, there is a small voltage left when viewing black.)

Video Signal Processing

Although some applications use the pre-amplified red, green, and blue video signals with little more processing, most cameras combine and process the primary color signals in some fashion. There are several types of video signal processing available. The type is usually determined by the input signal requirements of the videotape format used to record the signal.

Now, let's look at each of the three popular analog video signal processing techniques in the order of increasing quality: encoded (NTSC, PAL, SECAM), Y/C and component.

Encoded Signals

Encoded signals are used among equipment supporting BetaMax, VHS, 8mm, 3/4-inch U-Matic (not operating in the dub mode), two-inch Quadraplex, and one-inch Type-C videotape formats. Most older equipment supports one-cable encoded signal interconnection.

As shown in Figure 3, a camera that offers an encoded output squeezes the three primary color signals into one signal that contains all of the information needed to recreate the color picture. This reduces the number of cables required to convey a signal from three to one.

Within the encoded video signal is the black-and-white picture information conveyed by the luminance portion of the signal (abbreviated Y) and the color picture information conveyed by the chrominance portion (abbreviated C).

The chrominance portion of the signal is conveyed by a modulated subcarrier signal that is added to the unmodulated luminance. The peak-to-peak voltage amplitude of the chrominance represents color saturation in the picture. The color picture hue is determined by comparing the timing of the voltage peaks and valleys of the chrominance signal (that vary, depending on the hue) with the timing of the peaks and valleys of a non-varying *burst* reference. This burst is inserted into the chrominance portion by the encoder circuit.

The two popular methods of encoding signals in a camera include a standard established by the National Television Systems Committee (NTSC) of the U.S. Federal Communications Commission and a Phase Alternation Line (PAL) technique developed in the United Kingdom. (A



Figure 2

French technique using Séquentiel avec Mémoire, or SECAM, uses a completely different method of encoding. SECAM is used primarily for transmission and is rarely found in professional production equipment.)

The government of the country in which you operate determines which television standard is officially used for transmission and reception. There is no one best standard. The quality problems associated with encoded signals pri-

The Imaging Process

marily involve interference between the luminance and chrominance portions of the signal. The most common picture artifact is a pattern of dots that crawl around adjacent picture details with dramatic differences in luminance or chrominance. Another problem is a reduction in picture resolution that is required to fit all of the signal information within the allocated bandwidth.

Y/C Signals

There are two popular videotape formats that support Y/C signal operation: S-VHS and Hi8. Figure 4 shows a block diagram for a camera with Y/C video output signals. Two cables (that can be contained within one sheath) are used to convey a complete picture. One carries luminance (Y) and the other chrominance (C).

The Y/C signals are identical to the Y and C portions of an encoded signal, except they simply are not added together. However, the chrominance component of a Y/C signal contains burst. By keeping Y and C separate, the possibility of interference between the signals is eliminated.

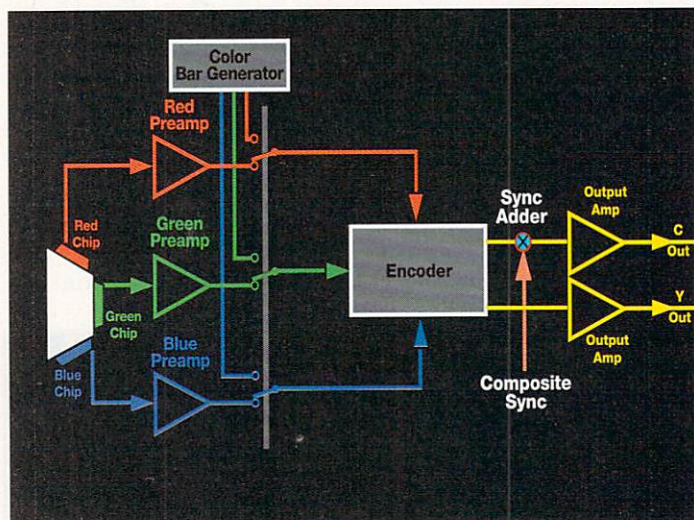


Figure 4

Component Signals

Interconnection among equipment that supports component operation requires three cables—one each for luminance (Y), red-minus-luminance (R-Y) and blue-minus-luminance (B-Y). Figure 5 shows a block diagram of a camera with component video output signals. These three signals are simply three different combinations of red, green and blue with no modulation applied to a subcarrier and no burst present.

The absence of distortion-prone processing and the separation among the critical parts of the signal creates the highest quality available from a videotape format using a small tape width. The two popular videotape formats supporting analog component operations are Betacam-SP and M-II.

Adding Sync

Once the video signals are processed, synchronizing information must be added so that other pieces of

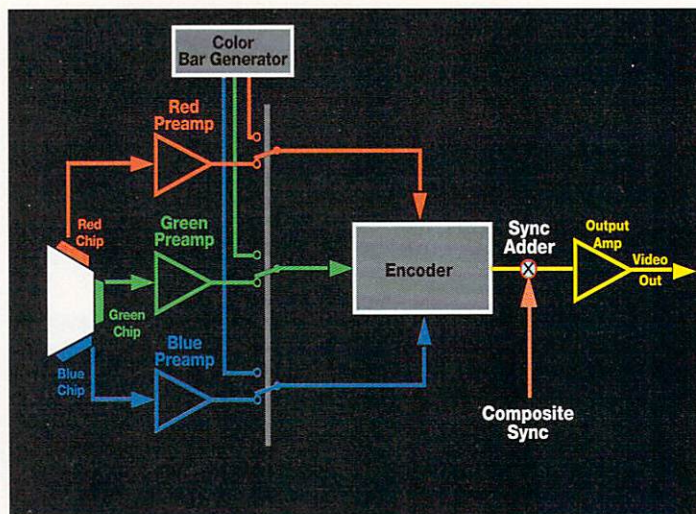


Figure 5

equipment used to record, process, or display the signal know exactly how it was created within the camera.

In a circuit called the sync adder, composite sync (with vertical and horizontal synchronizing information) is added to the processed video signal.

Output Amplifier

The output amplifier circuit is the last circuit through which the video signal passes before it leaves the camera. It is this circuit that determines the *master gain* and the *master pedestal* that is applied to the signal(s).

With this overview of how a basic color television camera works and last month's information on how to match the lens to the scene and to the camera, it's time to move onto sound. Next month, same time, same channel, we'll look at the audio process. In the final installment, we'll look at the recording process and include an overview of what it takes to display the signal.

VTU

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

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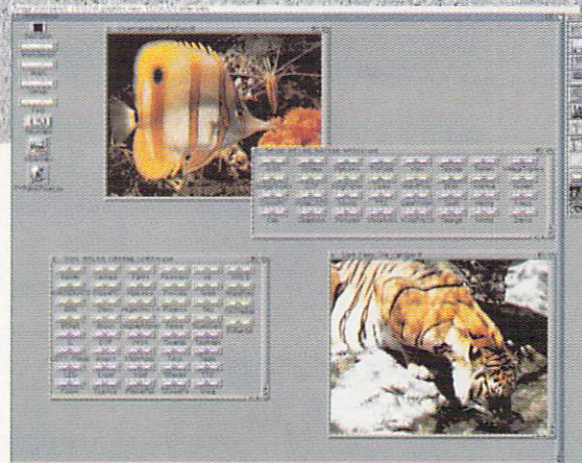
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The Picasso II RTG emulator has been designed so that it uses no chip ram for its emulation. Only the currently visible display is kept in the Picasso II display memory, all other screens are stored in standard system memory. This means that all system 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.

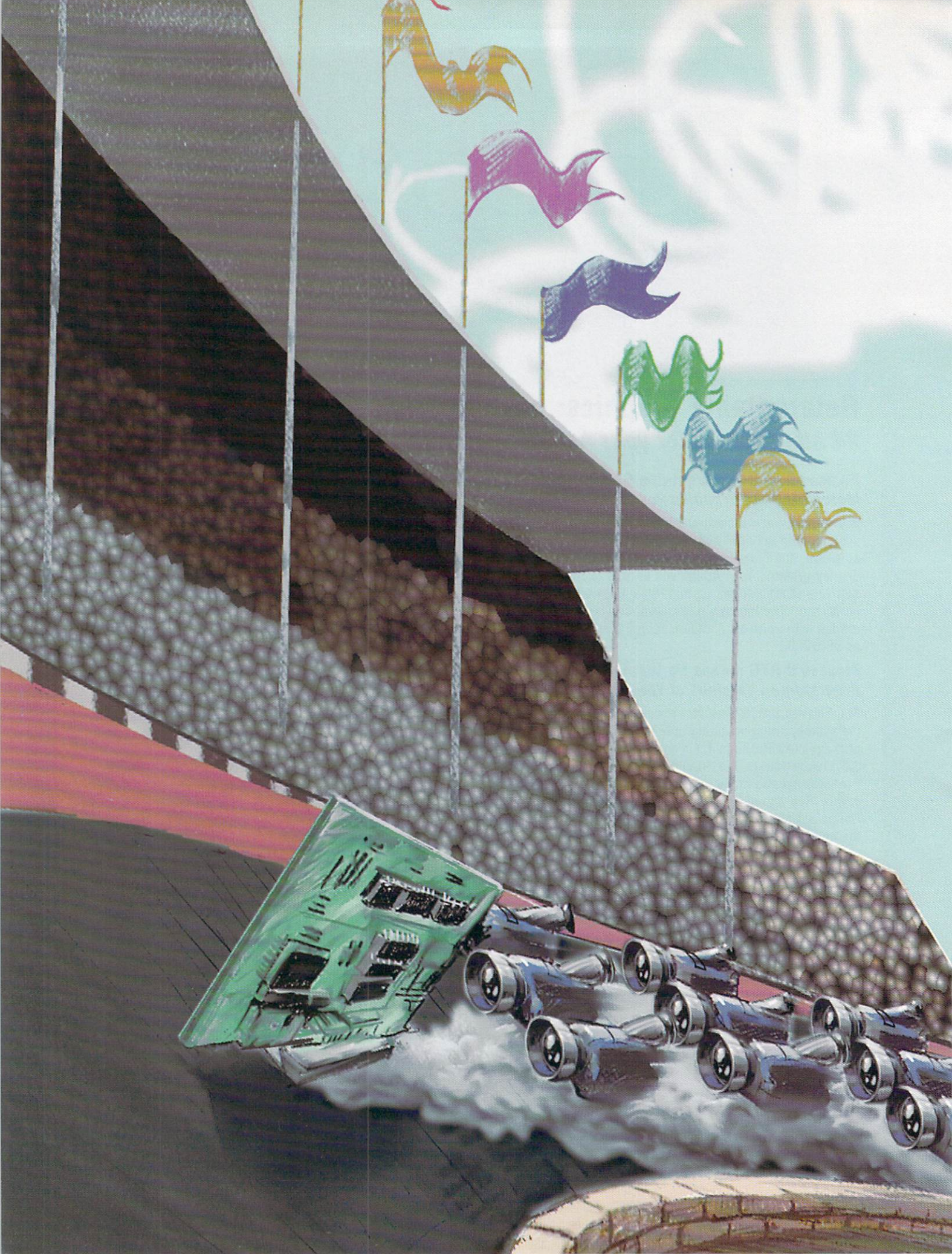


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The Evolving TBC

By Phil Kurz

Imagine standing high above the brickyard at the Indianapolis Motor Speedway. Before you on the track rests the entire field of race cars neatly arranged three abreast in rows and evenly spaced in columns.

The voice on the public address system tells the racers to start their engines. The pace car pulls in front of the racers and the pack of cars begins to roll down the track. From your vantage point, you notice that for the first few moments of the pace lap, the cars appear to be locked in their rows and columns, each maintaining its position in relationship to the next in distance and in time.

Now imagine that the pace car remains on the track for the entire race. For some inexplicable reason, the Indy cars remain locked in their precise formation, never deviating from their designated position, never changing their speed. If this were the case, the cars could be said to have a stable time base. If a car changed its speed, straying from its appointed spot, a spotter in the pace car would communicate with the driver over a cellular phone and tell him to speed up or slow down to maintain the formation. Thus, the time base of the pack would be rectified. The pace car spotter would in essence become a time base corrector.

Pause, Rewind

The Indianapolis 500 exists in the real world, however. Once the pace car leaves the track and the Indy cars cross the starting line, they begin to accelerate independently, tearing the tidy formation they held into an unrecognizable shadow of its former self.

The same sort of precision demonstrated in the pace lap is necessary for video to take shape on-screen. In video, row after row of electrons are sprayed successively across the picture tube to paint a field of video every sixtieth of a second. Each time the tiny guns shooting the electrons reach the end of one row, they stop firing, which is called blanking in video parlance, retrace to the beginning of the next row and begin firing again. When the guns have sprayed

one entire field of video on-screen, they blank for their vertical retrace to the top of the screen and begin shooting the next interlaced field of video one row at a time.

This process of spraying electrons and retracing the TV screen relates directly to what goes on inside a television camera. In a camera, light energy falling upon the photosensitive imaging area of a CCD (charged couple device) or pickup tube is converted to an electrical charge for each picture element in the system. One row of charges is read out of the imaging device or scanned from a pickup tube every 63.6 microseconds. (Actually the picture information occupies 52.1 microseconds and the remaining time allotted to one horizontal scan is occupied by system synchronizing and blanking signals inserted before and after the active picture information.)

Like the imaginary Indy 500 where the race cars remain absolutely locked in position and time, video has a precise time base. Its race cars are picture elements called pixels and its pace car is called a time base corrector (TBC). Without a TBC, video played back from a VCR in an editing suite would at best look like a flag waving in the breeze. At worst, it would tear into an unrecognizable display much as the real Indy cars break out of formation as the race begins.

Time base errors in video can result from many causes. Videotape that's stretched, imprecise servo motors in tape machines that cause the video equivalent of wow and flutter, and gyroscopic time base errors resulting from sudden fast pans can create video time base errors. Upon playback, these kinds of errors cause the rows of electrons to be shot across the screen in more or less time than the precise time base of video, which is exactly 63.6 microseconds.

The job of a time base corrector is to rectify the timing of a video signal so that it can be mixed with other video source material flawlessly. Unfortunately, retiming the video signal isn't as easy as picking up a cellular phone, calling an individual pixel and telling it to speed up or slow down.

To retime the video signal, modern time base correctors escape the analog world and rely upon

The Evolving TBC

the easily molded clay of the digital domain to reshape the time base and even the signal characteristics of video.

Inside the time base corrector, incoming video is stripped of its synchronization and blanking information. The remaining raw video is digitized and stored in digital memory. Finally, timed by an internal clock, the

TBC reads out the digitally stored video signal timed precisely to the correct video time base, converts it back to an analog signal, inserts clean synchronizing and blanking signals and sends the video on its way.

Rectifying the timing of every line, every field and every frame of video that enters the device is the essential task of the TBC. However, because the video is digitally stored, the time base corrector is well-suited to manipulate the signal in ways that would not be possible in the analog domain.

Many TBCs let users apply two-dimensional video effects, such as posterization, solarization, freeze frame and inverse and upside down display, to incoming video. To illustrate how a simple digital effect works, consider inverse, upside down video. Once a frame of video has been stored digitally, it is not a difficult task for pixel information to be read out of memory in reverse order, that is right to left, bottom to top. The resulting video will display an upside down inverse image of the original video.

What is a Component-Processing TBC?

If you are thinking about buying a time base corrector, be sure to ask if the device you are considering provides composite or component video paths through the TBC.

A composite TBC processes luminance and chrominance information

together. It requires that coherence between horizontal sync and color subcarrier be maintained. To do so, composite TBCs are designed with onboard 3.58MHz voltage-controlled oscillators (VCOs) that lock to the horizontal sync coming from the

tape machine. The VCO feeds a coherent color subcarrier back to the VCR, which replaces its non-coherent color subcarrier with the newly created subcarrier. This approach is only appropriate when using heterodyne VCRs, such as 3/4-U, that provide for the subcarrier feedback and a composite TBC.

A composite TBC is generally less expensive than a component processing TBC, but VCRs with subcarrier feedback provisions are less common nowadays.

A more modern approach to composite TBC design separates incoming luminance and chrominance, creates coherence between the color subcarrier and horizontal sync through an on-board VCO, and then recombines the video for its one-path digital trek through the TBC.

A component-processing TBC maintains three digital paths through the TBC, one each for luminance (Y) and two chrominance components (R-Y and B-Y.) Because of its design, it does not have to deal with maintaining coherence between the color subcarrier and horizontal sync. Generally, the component-processing TBCs use a more-expensive filtering technique than their composite cousins, which results in reduced ringing in the video.

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Most TBCs also provide control over other aspects of the video signal through adjustment of processing amplifiers, often called proc amps. Proc amps allow users to adjust video level, chroma level, burst phase and blanking level. (See "Understanding Proc Amp Controls" for more information.) These proc amp functions give users of TBCs control over critical analog video signal parameters to ensure that the signal they are introducing into the rest of their video system is correct in every respect.

Climb Every Mountain

The NewTek Video Toaster launched a stampede of personal video producers to the desktop. With its video switcher, effects, character generation and video paint capabilities, the Toaster was a natural for desktop video editing. At about the same time, inexpensive S-VHS decks, such as the Panasonic AG-1960 and its successor the AG-1970, presented personal video producers with affordable VCRs around which to build a desktop A/B-roll editing system.

Seeing the need for an affordable TBC, Digital Processing Systems (DPS) introduced the \$995 Personal TBC board-level time base corrector for Toaster users shortly after the Toaster shipped. Since that time, other companies, including Great Valley Products, Digital Creations, I.Den, Feral, Nova Systems, FOR-A, Prime Image and Hotronics, have followed suit.

Many of these companies have built their board-level TBCs around the Philips digital multistandard decoder (DMSD) chip and its supporting set of chips, which include a digital encoder and analog-to-digital and digital-to-analog converters. Besides the relatively low price of these chips, the DMSD and its companion chips have offered TBC designers the opportunity to provide functions, such as video standards conversion and compression effects, never before offered on time base correctors.

At least two recently introduced TBCs, the Prime Image Std/Con TBC (\$1,600) and the Great Valley Products TBCplus (\$949) offer the ability to convert video from one nation's video standard to another. The Std/Con TBC is being integrated into Toaster 4000 systems destined for the European and Asian markets by New York City-based equipment distributor Kelper International to offer a PAL solution to potential Toaster users overseas.

Understanding Proc Amp Controls

Most TBCs give users the ability to adjust a number of key analog video signal parameters. Board-level TBCs often provide software control over these functions. Most also offer an optional remote control of proc amps. Standalone TBCs often give users control over proc amp functions from the front panel of the device.

Among the commonly controlled proc amp functions are video level/luminance level, chroma level, hue or burst phase and set up or blanking level.

Set up or blanking gives users control over the voltage base upon which the video picture information is built. Blanking is measured as 0 IRE, pedestal, the blackest viewable black, is set 7.5 IRE units above blanking.

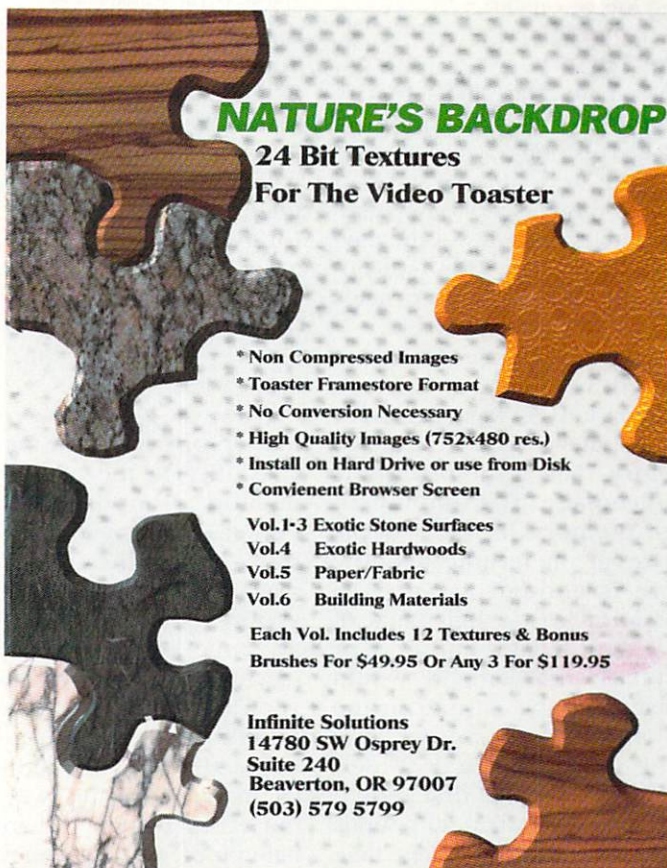
Hue or burst phase allows users to adjust the phase relationship between the color burst and the chrominance subcarrier. In effect, it adjusts the color hue of the video picture. (Think of hue as the spectral quality of color, i.e., colors in a rainbow.)

Chroma level lets users boost or reduce the amplitude of the chrominance signal, which allows manipulation of color saturation. (Think of saturation as the intensity of color.)

Video or luminance level provides users with a way to adjust the amplitude of the luminance or brightness of the video picture.

Proc amp controls over burst amplitude and sync amplitude are beginning to be dropped from TBCs because the digital video encoders used in today's TBCs are preset at the factory and do not drift.

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The Evolving TBC

When the prices of these products are compared to the tens of thousands of dollars typically charged for stand-alone standards converters, it's easy to see why these TBCs are attracting the attention of non-broadcast video producers in PAL nations who desire the features of a Toaster but had no reasonable NTSC workaround.

Both the Std/Con and the TBCPlus accept NTSC, NTSC 4.43, SECAM, PAL, PAL-M and PAL-N video inputs and will standards convert to any of standards with the exception of SECAM.

The ability of the Feral Effect from Feral Industries to perform clean video compressions is another example of the expanding universe of TBC functions. The TBC, available as a stand-alone (\$2,295) or board (\$1,495), relies on some of the same Philips technology used in the standards converting TBCs. By using pixel and line interpolation techniques, the Feral Effect eliminates the pixelated effect often associated with compressed video. In so doing, it allows users to shrink video to various sizes without diminishing image quality.

Inside the TBC

While it's true that TBCs rectify video signal timing by digitizing incoming video, storing it and reading it out one line at a time every 63.6 microseconds, this description glosses over many of the intricacies of the time base correction process. How individual TBCs deal with these intricacies sets one device apart from another.

Today, many time base correctors are described as having an *infinite window*. A window is video jargon for what the computer industry calls solid state memory. The term *infinite* is really a misnomer. The amount of solid state memory in any TBC is finite; however, in infinite-window TBCs there is enough memory to accommodate at least a full frame of digitized video. That's enough for nearly any task and certainly would have appeared to be infinite in the early days of time base correctors.

In 1971, Consolidated Video Systems introduced the first digital TBC. It weighed more than 40 pounds and was five rack units high. The time base corrector held three memory

boards, each crammed tight with 1K shift registers to provide a three-line window of memory. CVS, which eventually went out of business, won an Emmy for its achievement and provided the rest of the television industry with a blueprint for rectifying time base errors in the digital domain. Even today, many of the basic principles used in the first digital time base corrector are applied in TBCs.

While three lines of digital memory may seem small when considering that most Toaster systems operate with a minimum of 7 MB of RAM, for the time the CVS TBC was revolutionary. Prior to its introduction, the only way to correct the time base errors of a video signal was through analog



The Feral Effects TBC compresses a second video source for insertion over programmed video.

means, most notably delay lines. Today, most TBCs have a minimum of 32 lines of memory and many provide more than a frame of digital memory. At first glance, it might appear that having more than a full frame of digital memory is overkill. After all, as long as each horizontal line scans across the screen in 63.6 microseconds, it would seem only logical that a few lines of memory would be sufficient to handle the time base correction chores.

However, time base correctors also must properly frame the video vertically. Before the price of solid state memory dropped, TBCs performed vertical framing by feeding a sync pulse from the TBC to the tape machine based on the proper vertical sync. In this way, the TBC could advance or retard the videotape machine's servo motor so that precise vertical framing could be maintained outside the TBC and read-write clashes could be avoided in the TBC's digital memory. In this way, TBCs used the existing VCR mechanism to eliminate problems before they arose.

This technique, called *advanced ver-*

tical, worked as long as the VCRs the TBCs were to work with provided an input for the TBC sync pulse. However, many of the VCRs that have fueled the revolution in personal video production make no such provision. Additionally, the price of computer memory has dropped substantially.

Therefore, most TBCs today are designed with more than a full frame of memory to do digitally what feeding advanced sync from a TBC to a deck did mechanically. With more than a frame of digital memory, incoming video can be buffered to avoid read-write errors and video can be properly vertically framed.

The Edit Suite and the VCR

If video transitions were nothing but cuts, there would be little if any need for time base correction. However, for A/B-roll editing to be pulled off without a glitch, time base correctors are essential. A quick return to the imaginary Indy 500 demonstrates why.

Imagine that instead of a single pack of Indy cars holding their position at the direction of the pace car, two clusters of Indy cars circled the track, each led by a separate pace car. In this situation, not only do the spotters in the pace car keep the Indy car drivers in precise position and time, but the pace car drivers are in radio communication with a spotter on a watch tower on the infield who feeds them information so that their driving is in perfect sync with one another.

As a result, when the two packs of speedsters pass the grandstand, it becomes obvious that the cars within each pack are in perfect position in space and time with respect to each other and that the two groups are in perfect sync with respect to each other.

In the editing suite, the spotter in the watch tower is the sync generator or video camera feeding synchronization information to each TBC. From the sync input, the internal clocks that govern the time base of each TBC as it reads out video can be locked together so that they operate in unison. Once the sources are time base corrected and synchronized, transitions in an A/B-roll edit can be accomplished without a glitch.

Raising the Checkered Flag

As long as analog videotape machines feed source video in an edit session, TBCs will be essential.

However, a quick glance around some edit suites and trade shows floors reveals that the video industry may be nearing the end of its final chapter on analog videotape machines.

Over the past few years, digital non-linear editing has made the transition from an exotic approach to building an off-line list to a form of editing that's poised to burst into the mainstream. Eventually, some non-linear system will deliver the quality that's deemed acceptable for on-line work. When it does, the need for much of the ancillary video equipment needed in an editing suite, including time base correctors, vanishes.

Does that mean that existing videotape machines and time base correctors will go away overnight? Probably not. However, it indicates that anyone wanting to edit video will shortly be presented with a radically new and different approach that will remove

many of the headaches of the traditional method of analog video editing. One of the headaches likely to vanish is the need for standalone and board-level TBCs.

With the introduction of the DPS Personal Animation Recorder, a device that lays LightWave animation to hard disk, a whole kludgy method of laying animation to tape was replaced. One can only wonder how long it will be before a similar product designed for video editing will surface to bring the benefits of non-linear, random-access digital media to the personal video producers using the Video Toaster.

When that day arrives, a new chapter in the personal video production revolution will open—one in which there may be no role for TBCs.



Phil Kurz is Editor-in-Chief of Video Toaster User and the co-author of Mastering Toaster Technology.

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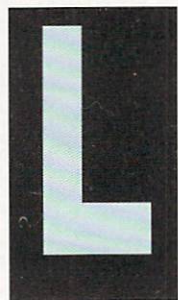
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ABCs of Video Part VI

more about match frame editing

By Rick Lehtinen

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



ast month, I introduced the concept of match frame editing and how to prepare the Toaster and its surrounding equipment to do it. The article focused on H-phase timing, the first step towards getting all the elements in your Toaster system to pull together.

This month we plunge into color subcarrier adjustments, which is the fine-tuning portion of system timing. We will also uncover a few Toaster *gotchas*—little quirks you should know about to make working with the Toaster a lot easier.

Match frame edits are those in which a series of transitions are taped rapidly back to back. A match frame edit must be used whenever the source tape is stopped and restarted. They are difficult because so much equipment has to perform precisely to do them successfully.

Without a properly timed system, you won't get to first base. Most editing systems will refuse to make a faulty edit. If any errors are detected with either the

time code or control track, the edit controller will abort the edit. The controller then lines everything up and tries the edit again. Subcarrier errors may or may not be grave enough to cause an abort, but they will certainly make an edit unsatisfactory.

A One-Liner

As you recall from last month, the Video Toaster replaces the sync on the video that feeds it with sync that it generates internally. This is why you cannot time video sources by looking at the Toaster output. Instead, you must disconnect the inputs and compare them with each other on a waveform monitor.

After H-phase is set, the subcarrier phase must be adjusted. The Toaster leaves subcarrier alone, so it is practical to make SC phase adjustments through the Toaster itself. This means we can hook up our subcarrier-phase measuring device (a vectorscope) to the Toaster output. See Figure 1.

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About Subcarrier

The color subcarrier in a video signal adds color information (C) to the basic monochrome luminance (Y) signal. Modulating all the color information on a 3.58MHz carrier keeps it out of the way of the grayscale luminance portion of the signal. This way, the luminance portion of the color video signal can still play back on a black-and-white monitor.

The color information is decoded by comparing the phase of two subcarrier color signals (I and Q) to a subcarrier reference signal called color burst. The I and Q signals flop around in time, and the burst remains steady. The differences are interpreted as color. In a nutshell, this is why subcarrier phase is so important. If it is set wrong, the colors will look goofy.

Connect the Dots

The standard display for measuring subcarrier is the vectorscope. This plots the color contents of a given image. See Figure 2. When a standard video pattern consisting of all the TV primary and secondary colors is displayed, all of the vectors should fit neatly in their boxes. Such a standard pattern of colors, arranged from left to right according to their luminance values, is called *color bars*. The Society of Motion Picture and Television Engineers (SMPTE) developed a specialized bar pattern with a few extra goodies thrown in. This pattern is called SMPTE Bars. See Figure 3.

The best way to set color phase on a Toaster system is to record color bars from a test signal generator and play them back on the videotape machines to be tested. When the VTR (actually the TBC) is set up correctly, the *vector dots* will fall into their boxes. If they do not, you can gain some insight about what is wrong by simply reading the vectorscope. If the dots all show up slightly to one side or other of their boxes, the subcarrier is out of phase. If the array of dots is larger than the pattern of the boxes, chroma gain is set too high. If the array of dots is smaller than the pattern of the boxes, chroma gain is set too low. See Figure 4.

To compare sources, set up a wipe between the bar generator and the VTR and adjust the VTR until the dots from each source sit on top of each other in their correct positions.

Monitor Setup

If there is no vectorscope, a reasonable approximation can be made with a good color monitor and a test signal

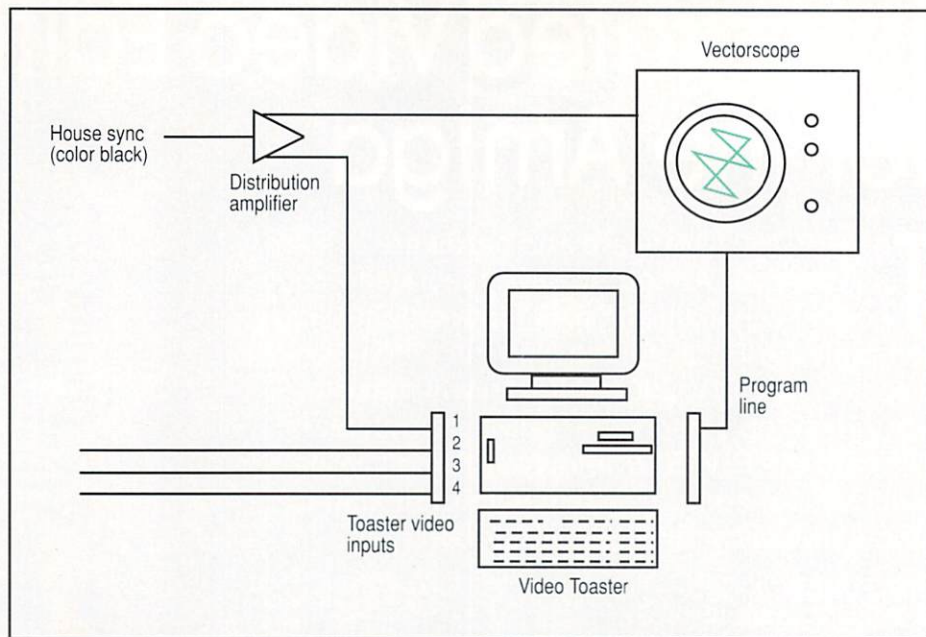


Figure 1:

The vectorscope measures the subcarrier phase of the video. The subcarrier phase must be correct in order for colors to be accurate. Subcarrier phase can be measured at the Toaster's output using a wipe between reference bars and recorded bars.

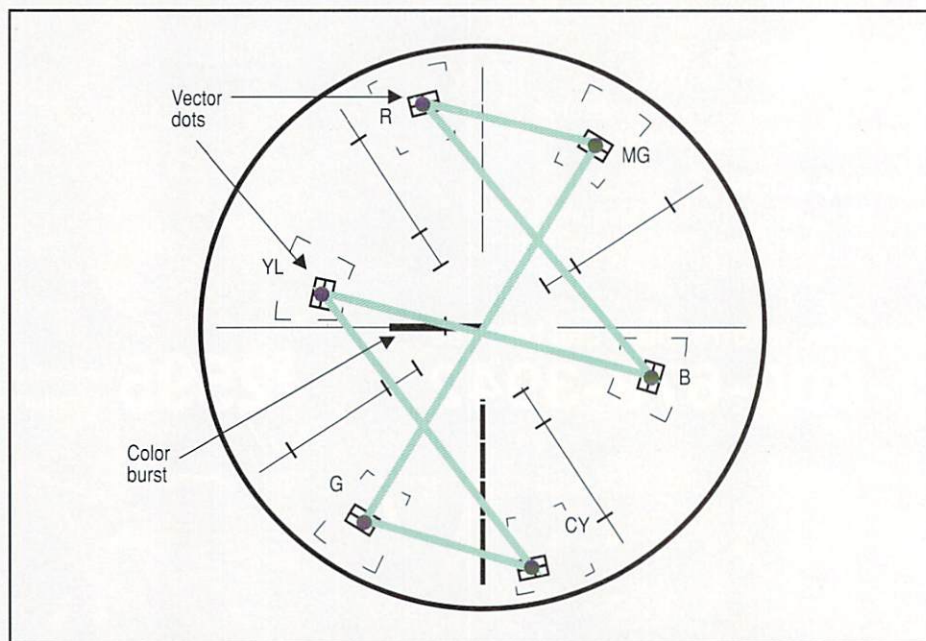


Figure 2:

The vectorscope graticule has boxes indicating the proper position for each dot (vector). Color burst shows up as a short vector reaching to the left of center.

generator set to SMPTE bars. (The bars that come out of most cameras might not work for this procedure. One of the extra goodies included in the SMPTE bars is a patch of reverse video that makes the adjustment much easier.)

The first step is to calibrate the monitor. The order of colors in the color bar signal is such that blue is part of every other bar. We can take advantage of this fact to guide us in our setting of monitor

hue and chroma controls.

Many higher quality monitors have a provision for displaying one color at a time. Set it for blue. Others have a switch that makes the monitor display only the blue channel. If this is the case with your monitor, set it for blue. You should be left with a pattern of alternating blue and black bars. In the event your monitor does not have these settings, some manufacturers supply a blue

plastic credit-card size filter or loupe. These devices pass only the light emitted by the blue phosphor on the CRT.

With the monitor set to blue bars or while looking through a filter, balance the amount of blue in the monitor's inner two bars by moving the hue control. By varying the chroma, balance the outer two bars.

However, you have to check monitor brightness. To do this, look at the *pluge* (rhymes with the winter sport of luge.) One pluge bar will be set at 5 IRE, one at 7.5 IRE and one at 10 IRE. If you set the brightness control on the monitor correctly, the 5 IRE patch will be invisible, the 7.5 IRE bar will be invisible or nearly so and the 10 IRE barely perceivable.

This routine will give you an approximation of a correct monitor setup. A true monitor setup is a detailed procedure. It may well be a job best left for shop technicians. Now that the monitor is aligned, you can feed it from the Toaster and set up a wipe between the bars from the test generator and a recording of the bars playing back on the VTR. Adjust the output of the device to match the color and brightness of the SMPTE bars.

Weird Stuff

If you have followed the procedures explained in this series of articles, you are now prepared to set up

your Video Toaster for editing using even the most expensive VCRs. You also will be able to make a better-than-average guess at what is wrong if things stop working.

However, there are a few Toaster-specific gotchas that you might encounter. These things do not happen to everybody, but they have confused enough Toaster users that you should be aware of them.

Level Shifts

The first weird thing is a series of tiny level shifts. These have several apparent causes, but they most often occur with the early Toaster boards. What happens is this: Early Toasters did not have a buffer stage to isolate the inputs from the sources. These are needed to isolate the input electronically from the source. If there is not adequate isolation, stray capacitances can change the effective

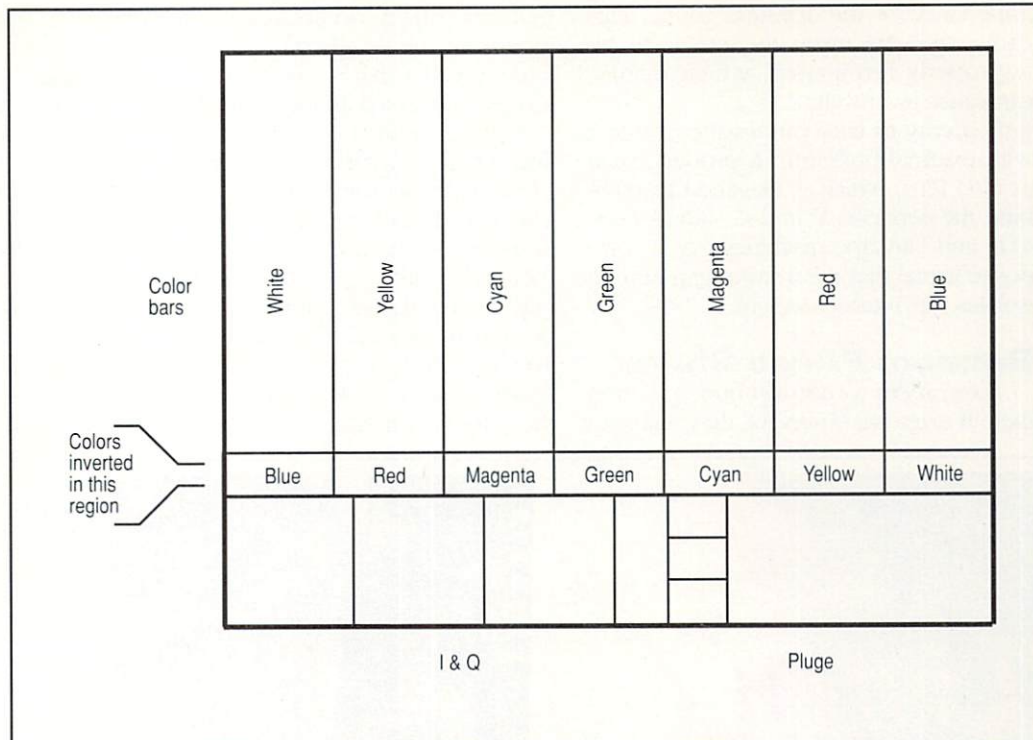


Figure 3: SMPTE color bars include a patch of inverted colors which simplifies setting the hue control on the monitor. The pluge on the bottom is an aid to setting monitor brightness.

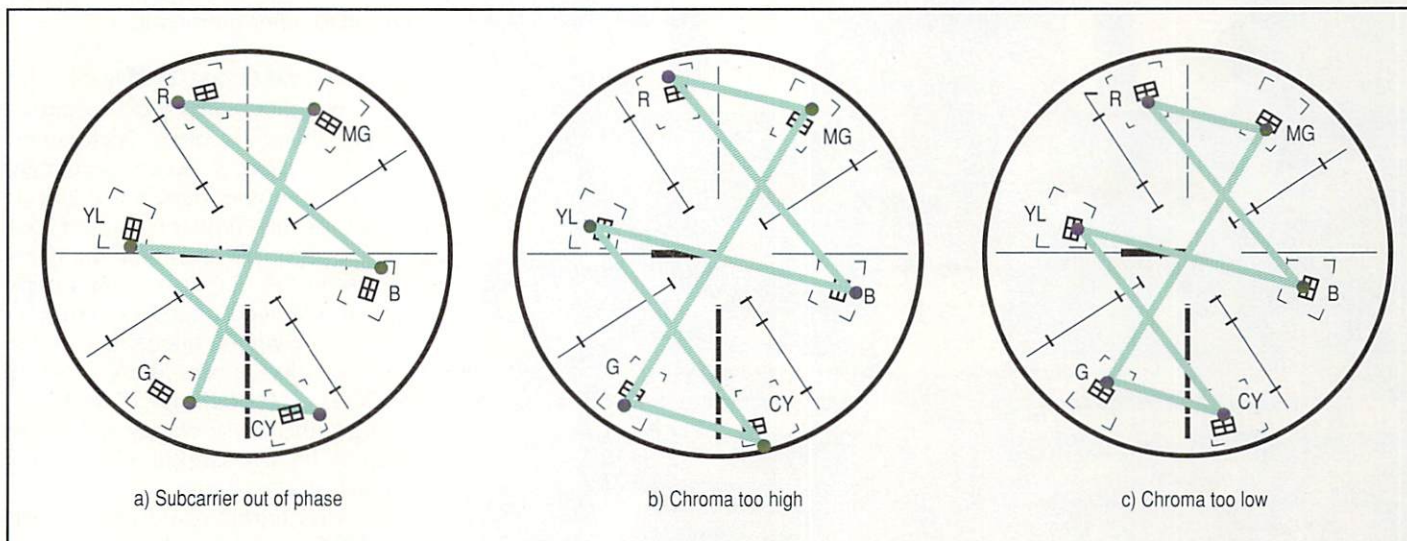


Figure 4: The vectorscope shows trouble at a glance. In Figure 4a, the subcarrier phase is rotated 7 degrees; this is a visible shift. In 4b, the chroma is too high, and in 4c, the chroma is too low. This can be corrected by setting the chroma-level knob on the TBC.

impedance of the Toaster's input. This can cause the input to appear to be improperly terminated, which in turn can cause level shifts.

It is easy to take care of the problem with external buffering. A product, such as Y/C Plus, which is designed to combine the separate Y and C signals of S-VHS and Hi8 tape machines into a composite signal that the Toaster can accept, isolates the Toaster's inputs.

Random Phase Shifts

These seem to pop up only now and then. If users are observant, they will note

that this usually occurs when the same input source is punched up to several different sources, that is, routed into a digital channel, and used as a key signal.

Here's how this one works: The Toaster uses a series of internal multiplexer chips to route its input signals to various locations on the board. Sometimes an input signal can go to more than one place at once, that is, it may feed a digital channel, a keyer and be on-line directly. Apparently, on some Toaster boards, there were certain combinations of multiplexers that could shift the internal capacitance of the circuitry

just enough to cause a minor phase shift.

The cure here is also external buffering, but it won't make it all go away (assuming it is actually occurring). The good news is that a phase shift of less than three or four degrees is usually invisible. Users should only see the problem if it in turn causes another problem, such as an editor hiccup.

High Black Levels

Some users have complained that the Toaster has high black levels. This has two causes depending on the age of the Toaster in use. In some early units, the resistors that controlled the encoder circuitry were simply the wrong value—not by much, but just enough to keep blacks around 10 IRE. Most of these cards are by now out of service. Of the ones that are not, the problem will only be apparent when trying to use the Toaster to feed a second device, such as another switcher. Most users simply won't be able to see the problem, even if it exists on their unit.

Another cause of high black levels is actually caused (and cured) by the Auto Hue adjustment. In truth, Auto Hue is both a phasing adjustment and a level adjustment. Its purpose is to match the digital levels leaving the Toaster with the analog levels passing through it.

This is done so users can transition between the digital effects and framestores without a noticeable transition. If for some reason the analog levels change or shift, the digital blacks will seem to be high. All that really needs to happen is to rerun Auto Hue. However, as Auto Hue has an effect on subcarrier phase, it may be necessary to recheck system phase after running it.

The Corduroy Effect

The new Toaster is subject to a particularly mystifying problem. Nicknamed the *corduroy effect*, it occurs seemingly at random when the Toaster is connected to a tape machine or camera that uses digital or comb filtering. If the energy present in the output of such a deck or camera is viewed on a spectrum analyzer, there are certain energy spikes visible. If the video is bars, these typically fall at 7MHz, 10.58MHz and 17.58MHz.

It's likely that these energy spikes are generated by the digital electronics inside of these decks or cameras. Frankly, this extraneous information should be filtered from the deck's output, but the manufacturers sometimes miss it. This is most likely done to preserve luminance detail.

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Now, here's the rub. The spikes are related to the video, hence they are coherent to it. The spike sometimes mixes or *beats*, with the 4x subcarrier frequency used to digitally sample the input video, and shazam, you end up with a modulation product that sits right in the middle of the video passband. This generates a whole host of spurious artifacts that aren't supposed to be there. Even at this, if the noise was random, it might not be noticeable; but, because the noise is created from and therefore related to the video, it produces a highly visible set of little lines that appear to look like corduroy fabric.

The cure for this malady is to use input filtering on the Toaster. Y/C Plus Inc. makes a gizmo called the Lopez (derived from low pass) filter that does a fine job. It is a steep-walled filter that diligently separates the spurious energy from the real thing. Interestingly, older or less-expensive video devices that use analog filtering, such as 3/4-inch U-Matic decks, almost never see the problem.

The Field One/Field Three Problem

By far the most insidious problem with early Toasters is the so-called field one/field three problem. What happens here? Basically, this happens when the Toaster genlocks to the incoming video on input one. In some modes, the Toaster reads color frames in order, but writes out two color frames advanced. In other words, it reads color field one and it writes color frame three. In nearly every instance, this hurts nothing. But if you are using fairly sophisticated decks and editors, the shift is enough to cause editors to abort, or more likely, to bump ahead one field, producing a jump on the edit.

Here's why: As the editor runs down to edit time, it uses time code to control the deck. As the time for the edit nears, the editor switches away from time code and starts operating from control track, which is more accurately tied to the servos. The editor will attempt to bump the servos so that the tape is in just the right position at the moment the edit starts.

However, if the color field is advanced, the editor will be fooled, and will either sense a problem and shut down or will bump the servo, creating a jump. Either way, the results are frustrating.

At one time, NewTek tech support advised users to turn the Toaster on and off theorizing that an internal flip flop was coming up in the wrong state. In fact, the problem is so subtle, and only

occurs on top-end decks, and then only in some modes, that this often appeared to work. However, a more permanent cure is to give yourself a handle, such as a delay line or delay DA, to tweak the phase of input one, leaving the others where they belong. This is illustrated in "ABCs of Video Part 5."

There is another trick that may be easier. It is sometimes possible to add just enough cable to input one (after it is properly timed, as described in "ABCs of Video Part 5"), to trick the Toaster's innards into bumping the phase of its internal sync generator. This will result

in a tiny horizontal phase shift, but it may not be noticeable. Again, the whole field one/field three problem is esoteric, occurs only rarely, and is associated with older Toasters. New Toaster's do not exhibit this trait.

Next Time

About the only thing left to talk about is how to use the Toaster in conjunction with other switchers and how to use it in a live switching situation, such as a multi-camera shoot. We'll investigate those next time.

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OFF THE WALL IMAGES TELEVISION PROJECTORS

By Peter Utz



Television projectors come in several tasty flavors: LCD (liquid crystal display) projection panels, LCD projectors, CRT projectors, and light-valve projectors. Each type has its own personality, strengths and cost strata. Let's go through the different choices, dwelling on the ones most appropriate for Video Toaster DJs.

LCD Projection Panels

An LCD projection panel looks like an oversized Etch-A-Sketch. The device sits on an overhead projector (the panel itself makes no light) and connects to a computer where the monitor usually hooks up. Now the image appears in the Etch-A-Sketch "window" instead of the computer monitor. Image brightness and size depend mostly on the overhead projector. Generally a 3,000-lumen projector is needed for acceptable brightness. Low-priced monochrome panels cost about \$700; 16-color models are roughly \$2,000; panels yielding thousands of color cost about \$6,000; and high-resolution types for workstations are approximately \$8,000.

Although LCD panels are primarily designed to be used with computers, a few of the upper-end models accept composite video. If you wish to display motion video, make sure the panel uses TFT (thin film transistor), active-matrix, liquid-crystal material.

Active-matrix models yield sharper colors, wider contrast ratios (the blacks are very black and the whites are very white), and handle motion well without smearing. The less-expensive passive matrix panels may display fewer colors, have poorer contrast and can only handle slow animations or stills.

Although an LCD panel may look a bit indecorous at a bar or dance, of all the technologies, they cost the least. The six-pound panels work with most any computer (if you get the right interface cable) and fit nicely in a briefcase or bike basket. Most work in VGA resolution of 640 x 480 pixels. In environments such as schools and boardrooms where overhead projectors are regularly used, the LCD panel may fit in just fine.

LCD projector

LCD projectors use a technology similar to the LCD panel, but with two major twists: The LCD panel works with an overhead projector's light, whereas the LCD projector has a built-in lamp. Secondly, the LCD panel works like an overhead transparency, blocking the light that passes through it and making all the colors at once. The LCD projector, on the other hand, has three smaller LCD panels built-in—each responsible for one of the three primary colors. Light from the projection lamp is separated into three colors, each passing through its respective panel, and is then recombined, allowing all the colors to pass through the lens at once. There is no convergence or complicated setup procedure; simply aim the projector and focus. The size of the image depends on how far the projector is from the screen and the focal length of the lens.

LCD projectors are desirable because of their light weight (about 25 lbs.) and reasonable cost. Three to four thousand dollars buys a model with relatively low resolution (around 100,000 pixels per panel) causing various degrees of "screen-door effect." The illuminated pixels are visible on the screen making the image look like it was shot through a screen door. Models costing \$6,000 to \$8,000 have more liquid crystal elements (about 300,000 per panel), yielding a sharper image with no visible pixillation.

Although some LCD projectors work with computers, most have video inputs and are designed for traveling video displays.

Tommy Gunn: New York's Video Effects Jockey

A 14-year veteran of the music business, Tommy Gunn has done it all except tour as the drummer for Spinal Tap. From supplying backup vocals for the 1980s popular, New York rap group, Grandmaster Flash and the Furious Five, to promoting heavy metal shows in Los Angeles, Gunn has continually sought new modes of expressing himself and recently found an opportunity to explore his nightclub terrain and make money.

Nine months ago, Gunn was running Acme Talent, an agency that would book Penthouse pets for public appearances and tours across the United States. Instead of hiring a graphic artist, Gunn decided to create his own business logo and a demo reel of the girls by borrowing a friend's Toaster. After exploring the machine during these projects, Gunn had found a new career path. "By the time I learned how to do the logo, I was convinced that the Toaster would enable me to do new kinds of promotion work in the music business as well as being a great tool for live applications as a video effects jockey."

Quickly relinquishing his interest in Acme Talent to a business associate, Gunn opened DNA productions, an animation and entertainment company. One of his interests was to use the Toaster's switcher effects in discos and music showcases. Armed with his list of club contacts from over the years, Gunn landed his first gig at the Grand.

"Since the club had ceiling cameras, all I needed was my Toaster and a monitor. I approached the gig as a way to be as creative and spontaneous as possible. I really know how to entertain people. After all, I used to stage dive at rap shows."

For the performance, Gunn hooked the ceiling cameras into input one and two of the Toaster to have two live feeds. At the same time, he had the program going to the club's six monitors; he noted that the same setup would be done if the club had projectors instead of monitors.

Discussing the process, Gunn explained, "All you do is switch from each input with different effects such as Chroma for psychedelics or whatever. I tried subtle effects, such as slow transitions and variable speed control. Those are helpful in really moody switches." He also likes dissolves and straight cuts but suggests not doing too many wipes because it makes the shots too choppy.

To get optimum shots of the band Naked Sun, he set the cameras off-stage right and towards the center to get a cross shot. Since they were pre-focused and very sharp, they didn't demand much of his attention.

Living in New York, in what may be a Mecca for aspiring Video Toaster VJs, Gunn believes that any Toaster owner who is serious about this as a vocation should purchase his/her cameras. "Even though many clubs like the Palladium have their own cameras or video walls, when you're starting out, you may have to approach smaller venues that don't have such equipment. And these clubs are the most approachable," Gunn said.

Currently working on integrating his live work with the Toaster into Studio 54's revamped burlesque show, Gunn believes that the creative possibilities are endless, but not necessarily in a traditional club settings. "I kind of thought that video in nightclubs was a bit out of style. It was more of an '80s creature of the night. But with the success of Raves (a late-night, after-hours club, often beginning at 2 a.m. and ending at 12 p.m.) new opportunities are always out there."

Josh Moscov



A Toaster-sized image of Naked Sun at the Grand.

TELEVISION PROJECTORS

CRT Projectors

CRT (cathode ray tube) projectors are really three, tiny, bright television monitors in a box. The image is projected through three colored filters, typically evidenced by the red, green, and blue colored snouts at the front of the CRT projector. CRT projectors are heavier (125+ pounds), more delicate, and more expensive than their LCD brothers, but yield a sharper, more accurate picture. Industrial models start at about \$5,000 and accept composite video only. Eight-thousand-dollar models are brighter and will multi-sync to NTSC video or VGA computer scan rates. Models costing from \$10,000 to \$25,000 are brighter still and will display high-resolution computer graphics from workstations.

When color accuracy and picture sharpness are paramount, CRTs are the popular choice. They are a bit inconvenient to set up, however, because the three-colored images must be converged exactly atop one another for the image to be sharp. CRT projectors are designed to work at a specific distance from the screen; when they are moved, it takes a minute to realign the colors.

If feeding computer signals to the projector, make sure that the two are compatible. Graphic workstations operate at high scan rates within the range of only a few CRT projectors. If the projector specification says that it has a horizontal scan rate of 15.750 kHz, the projector only accepts NTSC video (which could be composite or Y/C depending upon the model). If you are using a computer with a VGA card, the image will be progressively scanned at 31.5kHz, requiring a speedier projector. Professional graphic workstations go up to 60kHz and beyond.

Light-Valve Projectors

Light-valve projectors use a more complex technology to beam the sharpest, brightest pictures on the screen, suitable for theatre projection. Weighing in at over 300 pounds (enough to flatten a bike basket) and

costing approximately \$70,000, these projectors may be beyond the reach of personal video producers. Still it is worth noting that they operate with video as well as just about any computer scan rate available.

Projection Surfaces

A white matte screen is the professional version of the white bedsheet. Light bounces off such screens in all directions—both a blessing and curse. The blessing: Your audience sees an equally bright image at all angles, sitting on the floor or hanging from the chandeliers. The curse: The image is a bit dim.

Beaded screens may yield an image twice as bright spread over a narrower angle, which is great for audience

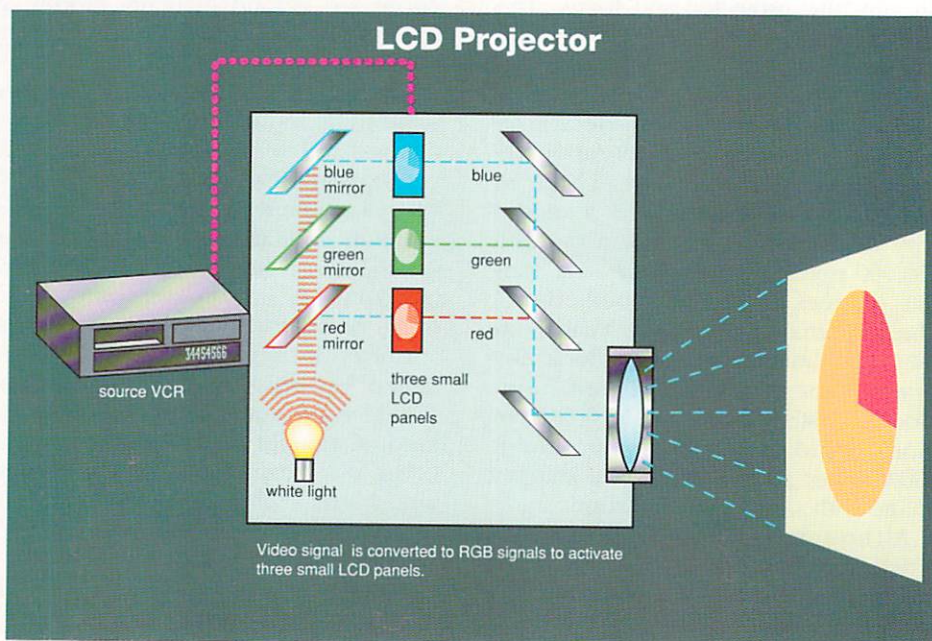
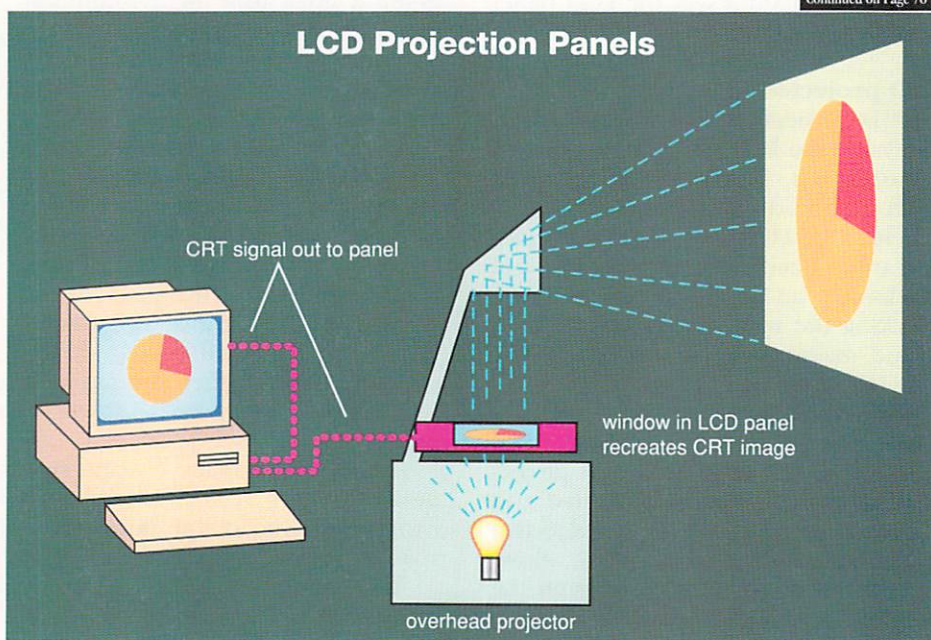
members on the axis of projection, but poor for guests on the sidelines.

Lenticular screens look silvery rather than white and reflect a bright image to the center, left and right (where viewers are likely to stand or sit) and wastes little light on the floor and ceiling. Lenticular screens work better than beaded or matte screens in partially lit rooms.

Solid, curved, silvery high-gain screens may be 10 times as reflective as matte screens, yielding a bright image unfettered by room lights or sunny windows. The high gain curse: The image is visible along a narrow field, good for only a few guests.

Rear-screen projectors look like giant TV sets and beam the image from inside

Continued on Page 76





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TELEVISION PROJECTORS

the box onto the back of a smoky-colored screen. Rear-projected images are relatively bright and can survive moderately lit rooms. Rear projection obeys the same laws as front projection: the higher the screen gain, the brighter the image over a narrower field of view. Beware of using home-style, large-screen TVs for standing or moving audiences; the best view is directly in front of the screen. Since most couch potatoes watch TV sitting down, the screen beam sits best about three feet from the floor. To impress a standing audience, set your consumer big-screen TV on a two-and-one-half foot platform.

Evaluating LCD Projectors and Projection Panels

When selecting an LCD projector or projection panel, ask these questions:

1. Is this an active-matrix or passive-matrix panel? Passive-matrix panels have low-contrast ratios (10:1), slow response time (about 200 milliseconds for one picture to dissolve into the next), and a tendency to "bleed" (causing a faint "ghost" of an object just beyond the object's boundary). Passive-matrix panels are relatively inexpensive and the image quality is improving each year. Active-matrix panels have a high-contrast ratio (up to 200:1), fast response time (about 50 milliseconds, good enough for live video), and do not exhibit "bleed". Active-matrix projection panels are relatively expensive.
2. What is the panel's response time? The faster the response time, the less smear there will be to moving images.
3. How many colors does the panel project? No one really counts the colors that a panel can make, and there are no industry standards defining how the colors are measured. We must then rely on manufacturer specifications which are generally mathematical calculations. Be aware also that the computer may generate more colors than the panel is capable of reproducing. When displaying computer text or graphics, 16 to 100 colors may be fine. When display-

ing video, thousands of colors may be necessary to adequately reproduce realistic flesh tones.

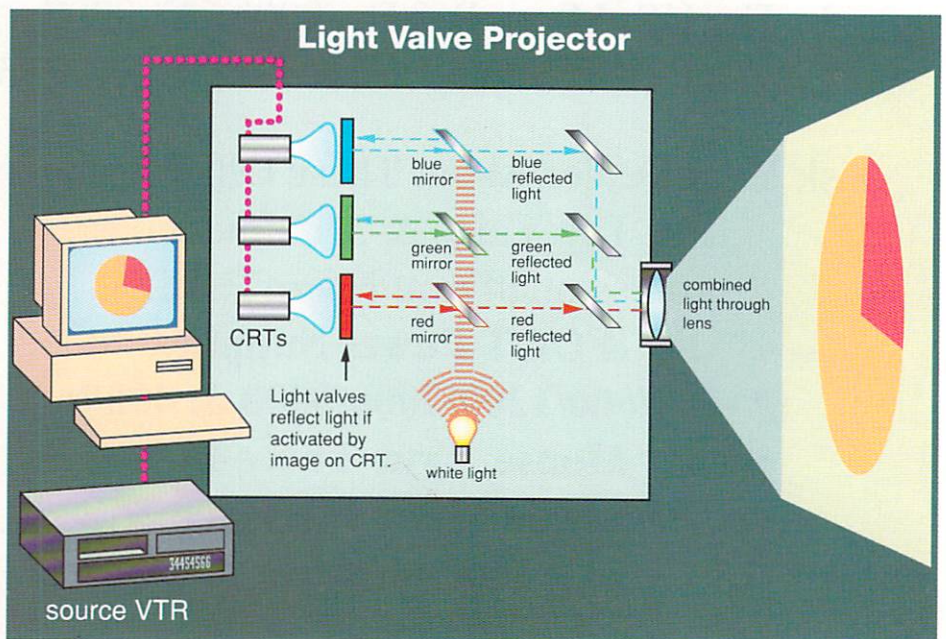
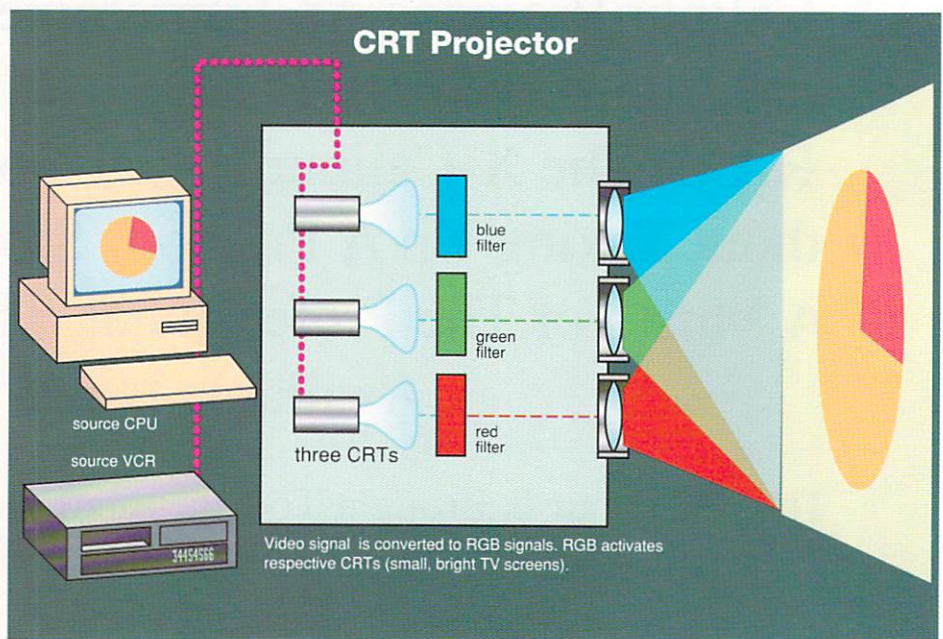
4. Is the panel compatible with your computer (or other computers that may use it)? Some LCD devices have video inputs, others require a computer input (usually VGA). If you have a Macintosh or other type of computer, check that the projector is compatible with it; optional cables or adapter boxes may be necessary. Some LCD panels require adapter boxes to display video. Some boxes will work with NTSC only, while others display the other video standards, PAL and SECAM.
5. Is there a built-in video buffer and "Y" cable? A Y cable will split the

signal allowing half to go to the CRT for simultaneous monitor viewing while the other half goes to the LCD panel. Splitting the signal weakens it, making the image dimmer unless the panel has a video buffer to isolate the two.

6. How resistant is the panel to heat? Some overhead projectors get pretty hot causing the colors to fade and change. The better panels have fans and infrared filters to keep them cool.

Projection on the Go: Tales from a Rental House

To get a better idea of the problems you might encounter when moving video projection equipment and leaving it in public areas, I spoke with



Guy Nadeau of Giant TV rentals in Dover, N.J. He had the following tips regarding LCD panels.

The minimum 3,000-lumen projector costs about \$600. The color and brightness of the image across the projection screen will be slightly uneven and the fan may be loud. Approximately \$2,000 will buy an overhead projector with a metal halide lamp and better optics. These projectors put out 4,500 to 7,600 lumens of brightness spread evenly across the screen. The optics are sharp and the fans are generally quiet. Buhl, Elmo, 3M, and Dukane make such projectors. Fans and heat filters help keep the projection surface cool (LCD panels get cranky when hot). Beware that the metal halide light bulbs cost \$400 to \$800 each, as opposed to \$30 to \$40 for the normal quartz iodine projection lamp.

As for CRT video projectors, remember to keep the room dark; although their images aren't dim, they are still not generally bright enough to overcome illumination from office fluorescents or daylight from windows.

Follow the distance and height requirements for a CRT projector; its lenses are designed to work at a specific distance from the screen and the image is keystoneed (scanned in a slightly trapezoidal shape) to allow the projector to operate slightly off-center. This is so the projector doesn't have to be directly in front of the screen blocking everyone's view. Even though the projectors are designed to be placed level with the bottom of the screen (or the top when hanging from the ceiling), the floor-mounted projector still tends to get in the way of a seated audience. Moving the projector lower or raising the screen causes focus and keystoneing problems. One solution is to use a portable screen designed for overhead projector use. These screens have an anti-keystoneing boom which allows the screen to be tilted forward, making it more perpendicular to the projector.

More screen tips: Use a projection screen with a black border when possible. CRT projectors tend to under-scan, displaying the ragged edges of the image raster which include video-head switching noise, anti-piracy signals and other vertical interval data which are distracting to the eye. The black margin sweeps this visual litter under the border.

Positioning CRT projectors at the right

distance from a screen is sometimes tedious. One trick is to use a tape measure to get the distance right the first time, and then attach a string to your projector (or screen) with a button tied at the proper distance. Thus, the next time you set up your projector, you simply unwind your string from the projector and move the screen until it touches the button. Incidentally, the projector manufacturers usually have optional lens kits that can replace your projector's existing lenses and make the projector more nearsighted or farsighted. This not only changes the distance between the projector and the screen, but allows a larger or smaller image to be produced.

Whenever a projector is set up, it requires static convergence, a simple process that takes about a minute to complete. Static convergence positions the three-colored images so that they overlap exactly. CRT projectors that travel soon get road-weary and require dynamic convergence—a tedious 30-minute process of bending the pictures geometrically so that all parts overlap perfectly. For instance, if the red picture gets a little too tall, simple static convergence can only make the middle of the picture match the middle of the other two colored pictures. Only a vertical height adjustment can bring the top and bottom of the red picture in line with the others. CRT projectors are usually festooned with 20 or so controls to adjust these various geometric distortions. Tuning them up is a real pain in the wrist—a

good reason for keeping your CRT projectors mounted in one place. Incidentally, when performing a convergence of any sort, let your projector warm up for about 20 minutes, because the circuits and optics change slightly with temperature.

Guy Nadeau recommends transporting your projector in an ATA-certified case lined with 1-inch foam. He knows what he's talking about; there are no bumps or bruises on his gear.

Always bring long enough cable so that you can string it safely over doorways and away from foot traffic. Use good quality cable for reduced audio and video interference, low transmission loss and resistance to kinking. If your video cable is more than 100 feet long, you may need to give it a kick with an amplifier. Ditto if you are running several projectors or TV monitors at once from the same source.

And a few last thoughts: Buy a little circuit tester from Radio Shack and plug it in to the wall outlet before you plug in your projector. Public presentation areas get used by some pretty wild characters, some of whom take liberties with the electrical outlets. If the last person wired the outlet for 220 volts (to operate foreign or perhaps larger projection equipment), you'd rather zap your \$8 voltage tester than your \$8,000 video projector.

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Peter Utz has published over 200 articles and seven books on audio and video.

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What You Need to Know about **LENS FILTERS** and **Add-Ons**

Matching the Right One to Your Needs

By Dick Reizner



ou just finished photographing a beautiful kelly-green hillside under an azure sky dotted with white fleece clouds. Now, as you review the videotape, the hillside is pale, the sky is white and the clouds hardly show up at all. What happened?

Remember that wedding where you wanted to create a soft, romantic mood but were left with the crisp hard edges of your video picture. Is there anything you can do?

Then there were the times when you wished the zoom lens on your camcorder could get you just a little closer or include a little bit more of the subject.

Fret not for help is on the way. These are just a few of the many conditions that can be controlled or manipulated by add-on filters and lenses.

In the first case, the blue sky, clouds and green grass were probably washed out by reflected glare. Fortunately, glare differs from the light we want to record in an important way; it is polarized. That means

the waves of light are all vibrating in the same direction. (Normal reflected light is random in its direction of vibration.)

A polarizer filter can eliminate that glare. You can see the dramatic results by holding the filter to your eye and rotating it. You will notice the sky darken, and colors become more intense as you rotate the filter and the amount of glare eliminated increases. Find the picture you like and mount the filter on the camera in the same position.

To make that part of the job easier, polarizer filters can be purchased in a split mount. The filter glass is attached to the front portion of the mount and can be rotated while the back, which is attached to the camera lens, remains fixed.

Some quick hints when using a polarizer. Be sure you are not wearing polarizing sunglasses. The combination will drive you nuts.

With most video lenses, be sure to focus first, then rotate the filter for the best picture. That way the filter will not change orientation when you turn the lens barrel to focus.

It's also a good idea to turn off the automatic exposure control while you adjust the polarizer, or you may end up chasing your tail.

Polarizers come in standard and circular types. Cameras with beam splitters, which include most video and automatic-metering still cameras, will get better results with a circular polarizer.

The polarizer works best when the sun is coming from a 90-degree angle to the direction in which you are shooting. It works least when the sun is directly behind you or your subject.

Polarizers also can be helpful in reducing reflections when you are trying to shoot through store fronts, picture frames and other types of glass. They can cut down glare from water, road pavement and many other non-metallic surfaces.

I have even used a polarizer to reduce the glare from a man's bald head.

Another cause of constant reduction is ultraviolet [UV] light. It is UV light that causes a distant scene to appear blue or hazy on a clear day. The cure here is one of the series of sky or haze filters.

As with most corrective filters, the sky and haze filters come in a variety of strengths. The least effective, a 1-A, is basically a piece of optically clear glass; like any piece of glass, it will cut down UV. More importantly, it will protect the expensive front element of your lens from damage, dust and moisture. Many professional videographers leave a 1-A filter on their cameras at all times.

These filters will cut through UV haze, but they have little or no effect on smog and other types of atmospheric pollution.

The next category of filters is designed to reduce the contrast range of your picture. Some people think they make the harsh video picture look as if it had been shot on film.

Soft-Contrast Filter

Soft-contrast filters reduce the picture's overall contrast by toning down highlight brightness. Low-contrast filters do the same job by lightening the shadow areas. The low cons also can be used to ease the harsh shadows that can mar an interview in bright sunlight.

Neutral density (N.D.) filters reduce



Effect without soft-contrast filter.



Effect with soft-contrast filter (see reduced contrast).

the light reaching the lens. Many video cameras have at least one grade of neutral density filter built into their filter wheels. They are used when shooting outdoors in bright sunlight.

I use an additional N.D. filter on the front of the lens when I want to shoot at a wider aperture. The wider aperture decreases the depth of field and allows me to direct the viewer's attention to the sharp main subject by throwing the background out of focus.

Fog Filter

Fog filters create a subtle misty haze that causes highlights to glow softly. They soften sharpness and lower contrast, can be used to create a mood or add drama to a scene.

Double-Fog Filter

Double-fog filters are perhaps the most interesting because they can turn a bright sunny scene into a foggy day when properly used. They work best on large scenes with high-contrast lighting. The denser grades can make small, low-contrast objects within the picture almost disappear from view.

Star Filter

Star filters are sometimes called the glamour filters. They take any point of light within your scene, such as a candle, light bulb or bright reflection and



Effect without fog filter.



Effect with fog filter (notice the soft glow).

turn it into a multipoint star. They are frequently used to give sparkle to product shots of jewelry or automobiles and can add dancing highlights to a water scene. They are used frequently when videotaping entertainment events.

Star filters come in four-, six-, and

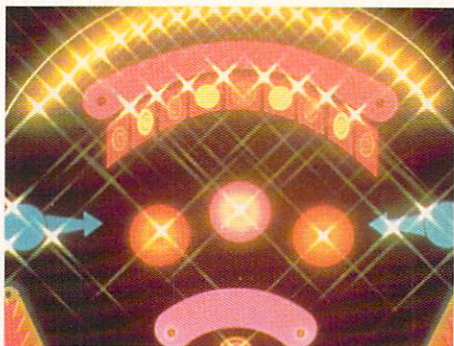


Effect without double-fog filter.



Effect with double-fog filter (from sunny to foggy).

All photos by Rob Goldman, courtesy Triften.



Effect with star filter (notice the multipoint stars).

eight-point versions as well as some interesting combinations.

Sepia Filter

For an old-time movie look, try a sepia filter. It will add warm, brown tones to your color picture.

There are also a few tricks that your video camera can do without the help of an outside filter. If you would like to give your picture a warmer look, try white balancing through a light-blue piece of lighting gel. A one-eighth blue gel, normally used to convert quartz light to daylight, works well.

Outdoor nighttime can be simulated by white balancing to indoor (3,200



Effect without sepia filter.



Effect with sepia filter (notice the warm, brown tones).

degrees Kelvin) light and then shooting under daylight conditions. This will give your picture a slight blue tint. Light your subject from behind as

much as possible and shoot one and a half to two stops under exposed. If need be, you can enhance the effect by using a polarizer filter to darken the sky.

There are several types of add-on devices to change the zoom characteristics of your lens. Some fit on the front like a filter and others go between the main lens and the camera body. They are the most practical way to handle that need for an occasional telephoto or wide shot.

Wide-angle adapters fit on the front of the lens and come in two basic types. The less-expensive kind turn your existing zoom into a wider angle non-zooming (fixed focal length) lens.

More money will buy an add-on lens called a retrozoom; it will move the range of your existing zoom in the wide direction. That means you will still be able to zoom and the wide-angle end of the range will be wider. However, the telephoto end will not let you zoom in as close.

The telephoto range of your lens can be extended with an add-on lens, which is sometimes called a teleadapter or teleconverter. Whatever they are called, they fit on the front of your existing lens and do not require additional lighting.

There are a few consumer type add-ons that can be flipped around to give you a wide angle in one direction and a telephoto in the other.

If your camera has interchangeable lenses, you might also want to investigate an extender. This is a gadget that fits between the lens and the body. It physically moves the lens farther from the pickup surface and so moves its entire zoom range in the telephoto direction. The drawback of an extender is that it will reduce the light-passing ability of the lens.

With a little practice and the correct lens add-ons, it's easy to avoid the white sky and cut off heads. Just remember when you purchase any of these filters or lenses, get the best you can afford. It's much better to buy a good filter or lens once than to purchase a cheap one, two or three times.

VTU

Dick Reizner is an award-winning freelance cameraman with more than 32 years of experience in film and video.

[Editor's note: The author wishes to thank Tiffen for its assistance in providing photos and information for this story.]

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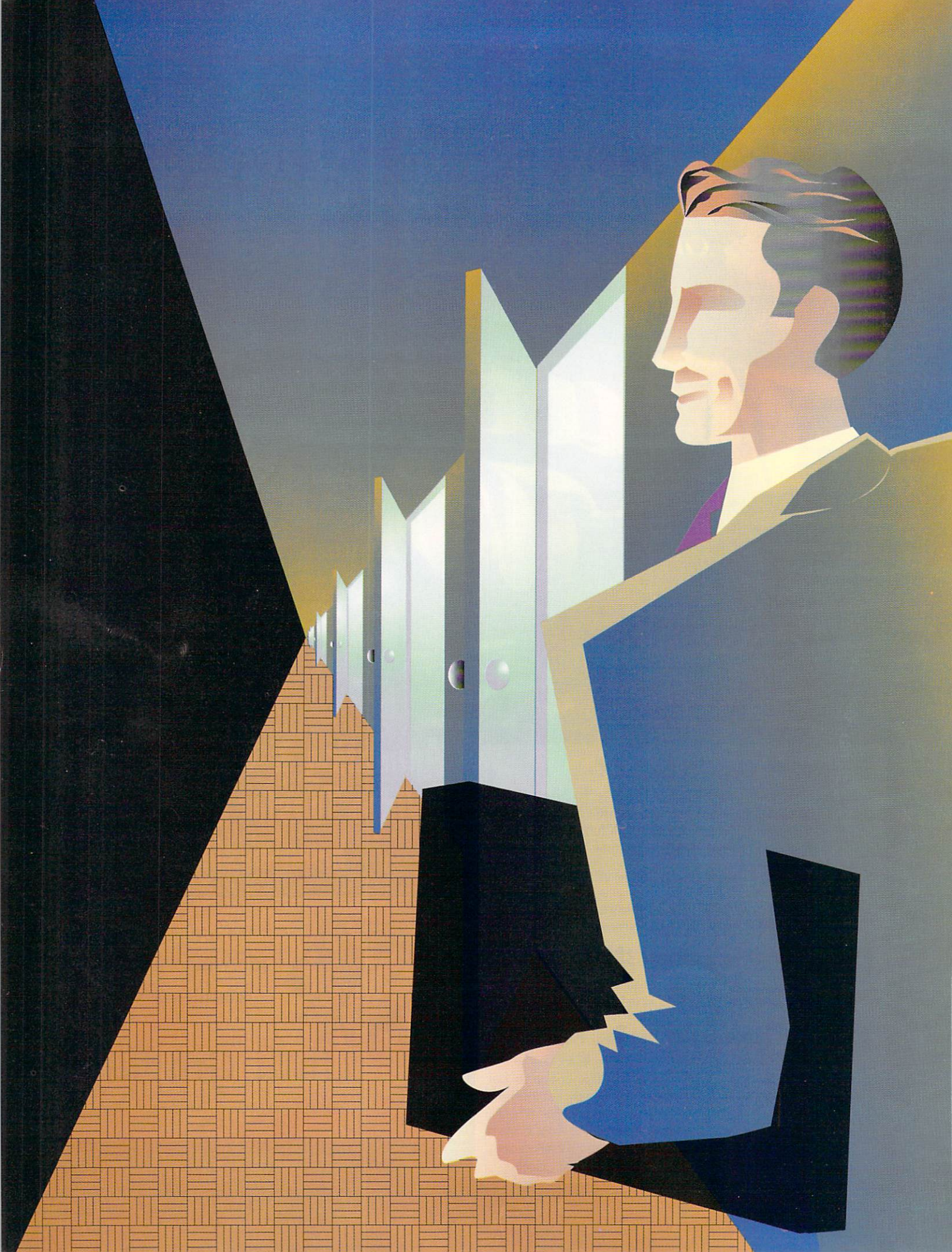


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CASHING IN ON THE TOASTER

Real People Find Business Opportunities Aplenty

By Allen Edmonds

The recent uproar over the North American Free Trade Agreement produced few areas of consensus. Proponents screamed for open markets while opponents raged against job loss. Proponents enticed us with high-tech possibilities and retraining while opponents frightened us with images of college-educated bellboys and burger-flippers. And in the end, only one point of agreement could be found: This isn't your father's work world.

NAFTA or not, we're going to be finding different ways to put food on the table and cars in the garage. Gone are the handshake and gold watch for 40 years of service. The bilateral spirit of loyalty that stood behind every shiny new widget shipped from Company Town, USA, is history. In its place is the constant, nagging cry: do it faster and more efficiently. This is the global marketplace. Every business quarter is the ninth inning. And you have to compete.

But there's a response to this shake-up. Spurred by the very technological leaps that made us a global village with competition from every corner, this response is growing louder and

louder: You can compete. Not the company you work (or used to work) for, but you.

Some call them cybercowboys, the equivalent of the cowboy who used to travel the West, hooking up with different ranches that needed their skills. They had the know-how, the rope and the horse. When the job was done, there was another herd just past the horizon.

Similarly, today's corporations are finding it more efficient and profitable to operate as contracting centers, outsourcing critical goods and services. According to *Time* magazine's Nov. 22, 1993, cover story, "Jobs in an Age of Insecurity," regardless of the outcome of the current economic malaise, the future corporate profile will consist of "a relatively small core of central employees and a mass of smaller firms working for it under contract."

Boil the universal view down to the world of video production, and you have the perfect scenario for someone with the skill and the tools. Armed with the basic equipment, a Video Toaster and the production knowledge to make it sing, and you can take on the in-house, million-dollar editing suite and win the contract. You can capture the public's eye with top-

drawer, network-quality video that expresses your life's passion. Or, you can enhance your existing business promotion with style and glitz only previously available to the giants with Madison Avenue resources. It's being done successfully now, and it could give you the chance to pick out your own gold watch.

First Cast to Closing Arguments

The range of opportunity in video production has always been virtually limitless. However, true marketability comes only through the type of electronic excellence that was once the sole domain of the major networks and studios. But no more. Just ask Eric Langshaw.

A 15-year veteran of the Canadian National Park Service, Langshaw was tired of seeing all his wildlife studies projects land on a shelf, far from the eye of the public he thought he was working for.

"I was sick and tired of working for a bureaucracy that didn't appreciate me, so I quit," he said. Always a photography buff, he knew there was little market for still photography. But videotapes, he knew, were beginning to find their way into the suitcases of tourists returning home from the

CASHING IN ON THE TOASTER

breathhtaking Canadian Rockies near his Calgary home. With two camcorders hooked together, he produced a video on that breathtaking geography. His initial foray into video well outsold his most optimistic estimates, so he began looking at ways to upgrade the quality of his product.

"I interested one of the local public broadcasting companies into helping me produce a video on a fossil discovery that was quite important at the time," Langshaw said.

"They invited me to their studio, and I produced the product on their professional equipment. At that time, everyone was talking about this new product called a Toaster. I remember thinking that I'd better check into this thing because it sounded like nirvana to me. I had one look at it and thought, 'I've got to get this thing. This will allow me to do just about everything.'

"Instantly," he said, "I had a professional-level product that everyone just gobbled up."

This year, Langshaw's Canadian Wilderness Videos, based in Calgary, has sold more than 20,000 copies of its updated Canadian Rockies piece in six different languages, "and that allows me to do shows on wildlife and geology and all kinds of other subjects that I just love."

The video has, up until now, been marketed mostly through local gift stores, but is entering international

distribution. "The distributors are just falling all over themselves now to get this product."

And he isn't surprised.

"The future of television, as far as I'm concerned, is going to be us little guys sitting in our little home offices producing top-rated programs. The networks, within the next few years,

producing news and documentary pieces in the field for the major networks, but had to rely on those networks' studios for the effects.

"We decided to start this series called *Fly-Fishing Video Magazine* for the home video market," Watt said. "We were wanting to get to the point where we eventually were doing our own effects, but we had to find ways we could do it and still save money."

Enter the Toaster.

"It's allowed us to put our shows together so that they look as good as any television show for probably one-one hundredth of the cost," he said.

So sharp was the production, he said, that ESPN snapped it up. For at least its first year on the national sports network, *Fly-Fishing Video Magazine* was the only nationwide show that was being done entirely on the Toaster."

Just as fly-fishing fits the Northwest and wildlife applies to the Canadian Rockies, surfing and skateboarding goes with Southern California.

A professional skateboarder for 12 years, San Diego's Tony Hawk had always been into computers. He bought his first Amiga six years ago and gradually got interested in video production. "I never really knew how well I could integrate the two until I got the Toaster," he said.

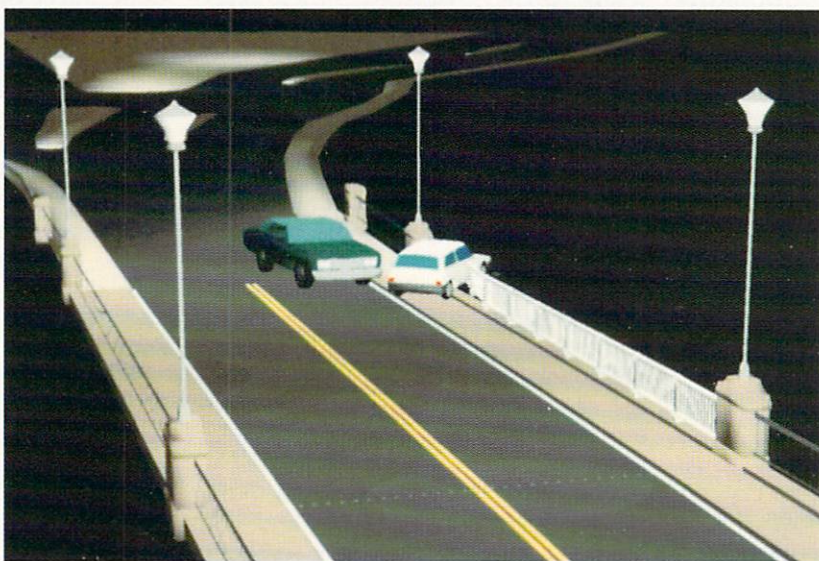
The LightWave 3D effects attracted him at first, but he now uses

all the tool's capabilities in producing videos for his company, Birdhouse Projects, which distributes promotional videos for the professional skate team he is part of.

"I've also been doing freelance



Video Law Services uses the Toaster to create forensic videos. Some of Video Law's most common video work is in depositions, day-in-the life documentaries and settlement brochures. These two images (above and below) are samples of accident re-creation.



are going to realize that we are the place to get really top-flight, inexpensive programming."

That's been the prescription for Jim Watt, whose Bennett-Watt Enterprises of Bellvue, Wash., spent its early years

videos for other skate teams, and I'm really getting into it a lot more. Right now, I'm producing a surfing video for a professional surfer. The things you can do with these kinds of productions are incredible."

Hawk's videos are marketed through local skate shops, but he has now included them as part of his team's marketing effort through skate magazines. "We tell people they can send \$15, and we'll send a video. Our productions aren't really to make money directly—they're to promote our team."

Former locksmith Steve Young of Pensacola, Fla., had similar ideas in mind when he founded Tech-Train Productions. "I used video as my way of getting out of locksmithing. So I had really found my niche before the Toaster came along—but it's certainly enhanced my business."

With 28 training tapes pertaining directly to various locksmithing topics, Young credits the Toaster with allowing his firm to grow quickly.

"The first few tapes we put together, we used a local company to do the editing. I sat behind them, and they did the editing on the first tape. On the second, they taught me how to use the equipment, and on the third, they gave me a key to the studio. So I worked all night and paid them by the hour for the use of the equipment."

The Toaster, he said, "frees me up from having to borrow someone else's equipment. I can do everything in-house and make it all look a lot nicer than I could before."

And it's expanded his business, he said.

"I've made two videos for companies that sell key machines to locksmiths—basically promotions for their machines, but they also give technical information. One of those companies is going to provide a copy of the tape with each machine. There are all kinds of companies out there that manufac-

ture products and have a need for this kind of medium."

Young discovered that need himself with a toolset he markets to locksmiths.

"Two years ago, I started including an instructional tape with each toolset, and it has boosted sales tremendously. It has also had the effect of reducing the number of questions I get about



As vice president of Video Law Services, Don Pence (pictured above) isn't one to just shuffle papers—he's a hands-on Toaster user and entrepreneurial success story.

the use of the various tools.

"There's one tool in the set that really requires some explanation on its use, and no matter how I tried to write the instructions, there was still a degree of ambiguity. But once I put a demonstration on the video, the phone calls stopped."

Young's wife, who is in the health-care field, "has discovered a crying need for video for patients on how to handle some of today's home health care situations. She's drawing up outlines now, and I plan to market some videos for that market before too long," he said.

Another friend runs a local industrial safety office which is required to give a certain number of hours of safety training each year. Young is planning to help develop a series of 10- to 15-minute short subject videos on various safety topics.

"You have to identify the need, find someone who is knowledgeable and work together. In my case, I just took the area that I already

knew and expanded upon it," Young said.

Like Young, Don Pence believes in "assessing where you're really good, then finding the niche that fits that particular area."

Vice president of Video Law Services of Jacksonville, Fla., Pence began with his wife several years ago with a minimal amount of equipment shooting forensic video. Depositions, day-in-the-life documentaries and settlement brochures dominated their activities as they began to make a name for themselves in legal circles through word of mouth and by teaching the legal community and other video professionals the art of forensic video. He concentrates on instructing would-be forensic video specialists on "how not to burn the marketplace, so that we'll all have a place to work."

"Back in 1989, we were looking for some sort of a device to provide us with graphics and a character generator. The Amiga was the only thing out there that would give us the bang for buck we wanted, and from there it was just a matter of matriculating up to the Toaster," he said.

That technological advance has "put us in the forefront with a product that is extremely polished and gives the value we have always based our sales and business practice theories on," Pence said.

"We're not brazen in our marketplace only because attorneys don't understand it. But if we can give someone, through production skill and knowledge, something that looks like it came out of a quarter-million to \$10 million suite, then we're going to do it. The Toaster is a tool that has given people a chance for decisive action—to go out and learn to produce things that have high production value."

In the sometimes staid legal com-

CASHING IN ON THE TOASTER

munity, there may appear to be only limited opportunities to really turn the Toaster loose. But Pence has learned—and is teaching others—to make it count when the time is right.

"In a day-in-the-life video, for example, we wouldn't really use anything that's Toaster-bound, save for the opening and closing graphics. But where we're really able to play it like an instrument are in our settlement brochures, which essentially are a no-holds-barred presentation of the evidence. They're done very much like a piece for *60 Minutes*—heavy graphics, lots of interviews, lots of B-roll cover footage. We use a minimum of the effects, because they're not in the taste range that would work.

"But this would apply to anyone—if you didn't shoot it, you can't cover it with effects. If it's not in the can, you can't whiz-bang it after the fact and have anything of value," Pence said.

Making Multimedia Magic

A different type of product enhancement has been critical to the success of HP Productions, a Vienna, Va.-based corporate communications and event planning firm. With eight full-time employees, the 10-year-old company does "everything from designing brochures to full multimedia," said company president Heidi Pfisterer.

"We'll design a logo for your meeting, do the print collaterals, come up with the theme and the interior design."

And here's what sets her firm apart. "We actually do it on the Amiga-Toaster system, using LightWave 3D so you can get an overview at the proposal stage before you spend money on a set. The niche the Toaster has created for us is the ability to outbid our competitors in the meeting field. It's less expensive to stage. We win because it's more flexible, and it gives us a better creative medium and tool to do what we do."

Initially, Pfisterer was excited about the release of the Toaster because of its portability and ease of use on-site.

"We do a lot of events, sales meetings and association meetings where there are hundreds of speakers who may use literally thousands and thousands of slides a week.

"And our thought was, wouldn't it be great to be able to use the frame-stores the Toaster has and incorporate



The *Educational Video Subscription Series* is an ongoing educational support program. Produced with the Toaster by Pacific Pictures, it covers subjects such as cultural education and current events.

its switcher to put together a show that allows you to accomplish all those things and not have to drag a slide projector out?"

The Toaster has propelled HP Productions' move from primarily a multi-image and video company into a multimedia firm.

"One of the most important advantages to this move is that we've found you can make changes up to the very last minute. Using a framestore and two Toasters, you can run one Toaster as a switcher to do live image magnification, and use the other to feed graphics."

There's another huge advantage. "They're real rugged to take on the road. We've never had a Toaster go down on the road, ever."

Some, like Ted Barszewski and Dan Nessel of Post Video Effect in New York City have found a way to launch an entire business on Toaster-based technology.

"We started out as a home video

edit outfit. No one we knew of had tried that, so we weren't sure what kind of market there would be, or if people would even be interested. We found out more or less that they weren't. It would have taken a huge advertising budget, because people really didn't understand the concept, and it was very difficult to get the word out," Barszewski said.

So they went a different direction—sports highlight videos for the corporate market.

"The largest corporate sports league here in New York does video highlights of all their play-offs for softball, football, volleyball and basketball. They have us film their games and then put them together into highlight videos."

It has worked beautifully, he said. "We've done some proms and school plays. But we've found sports to be the best. We can use all the special effects and graphic screens, and the Toaster really allows us to give it that network sports look which had previously been unavailable. Our scoreboards look exactly the same as they would look on any scoreboard on CNN or ESPN. And being able to do little 3D animations, like a basketball, in the openings, adds a great deal of professionalism," he said.

In addition, Post Video Effect is moving into the real estate market, producing videos that allow for video viewing of properties—a production the Toaster can also play a major role in.

"But especially with sports," Barszewski continues, "the Toaster allows us to make the presentation so professional that the league commissioner really feels it enhances his image to have it. It makes him look like the pros. Without it, his presentation would have looked like home video."

An Inclusive Technology

Everyone knows the huge percentage of business ideas that die at the banker's desk. But video has now become "an inclusive technology," said Joel Tessler director of Miami-based Automedia.

He's made a name for himself as the first person to use the Video Toaster in sports-related scoreboard

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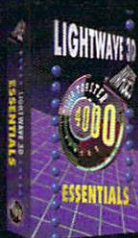
A step-by-step guide to the Video Toaster's digital video effects, set-up functions, ChromaFX and luminance keyer.

90 minutes



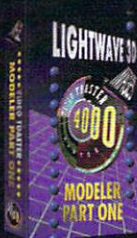
Complete instruction to ToasterCG's powerful text capabilities including font sizing, color brush loading, background & layering options.

100 minutes



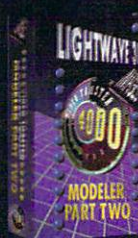
Discover the power of LightWave as basic 3D animation is explored. Learn scene creation, key framing, design and editing techniques for amazing animations.

120 minutes



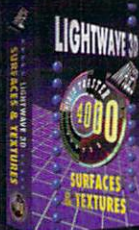
Create & modify basic shapes, making polygons with the freehand draw tool, using layers, creating text objects and assigning surfaces.

100 minutes



Change the shape and aspect of objects with modify tools, bending titles and logos, creating terrain using rail extrude, clone and lathe to create complex objects.

100 minutes



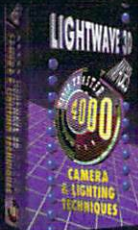
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100 minutes



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85 minutes



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59 minutes



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CASHING IN ON THE TOASTER

operations at Joe Robbie Stadium—home of the Dolphins and Marlins. His Automedia operation designs and runs automated photo classified advertising systems for cable television companies across the country.

"We're doing some modifications now so that it runs animation and full-motion video from the personal animation recorder. A cable operator is able to run 2,000 frames, each with a different Toaster effect," he said. And a major plus—the system is designed to bill automatically for the advertising.

This type of operation simply wouldn't have been possible for small business until recently, he said.

"I think inclusive technology is that technology which includes us, as opposed to the overpriced, muscle-bound technology that only a few people got to use. I think it's opened up everything for anyone who wants to get in there and put in the work to be a success on this platform."

Bennett-Watt Enterprises' Jim Watt agreed.

"With used equipment, you can put together two Betacam play machines, a Betacam SP record machine with a CMX-style edit controller that's based on an IBM platform and a Video Toaster and put the whole package together for under \$50,000," Watt said.

"And for that, you'd be doing network-quality video. Compare that with a \$350,000 suite. And with the suite, you didn't have the 3D animation capability and your character generation wasn't as good."

Richard Arsenault's Pacific Pictures International, based in Castaic, Calif., produces educational programming for elementary schools, junior high schools and high schools across the country.

"And there's no way I could produce even a fraction of what I do if I had to go to an outside source. I'd probably be doing about one-tenth of it, and that one-tenth would probably cost me three times as much."

His firm handles the entire produc-

tion process, from writing the programs to getting the tapes ready for distribution. "The Toaster comes into all the different post-production aspects—the actual switching and CG work and a certain amount of 3D graphics.

"I don't think there's a whole lot on TV that I haven't figured out a way to do in-house right now, and that's really revolutionary," Arsenault said.

"When I bought the Toaster," said Heidi Pfisterer of HP Productions, "I actually celebrated with a bottle of champagne."

The investment has meant her firm can now take on-site to her firm's events "three Toasters for less than what it would cost to have a 15-projector show. When I graduated from college in 1982, there was a room that held \$500,000 worth of equipment—equipment that couldn't even do one-sixteenth of what the Toaster can do. And for my first Toaster system, to bundle everything together that I needed to get started, I think I spent less than \$12,000.

"Who would have ever figured when I graduated from college that I could afford to buy the kind of equipment that would allow me to do this kind of work?"

You Still Have to Work

But don't think the Toaster will do everything for you, Jim Watt warns.

"A very common mistake I see people making is that they buy all this stuff and immediately think they're television producers. You do have to have some talent," he said.

"You have to invest a certain amount of time in any endeavor in order to be good at it. The great thing about this new equipment is that you can learn the business just that much faster."

Look hard at your limitations, advises Don Pence of Video Law Services.

"Don't be bogged down with fascination. When you don't know something, take the time to learn it.

"Or put together a team with a variety of skills," he said.

"Finding the niches is always going to be a tough task. It's really going to involve all the various skills your people are interested in. I've never found one person who did

absolutely everything well," Pence said.

Anyone—no matter how advanced in the field—is a possible client, said Phil Cunningham of Videodata Communications, an interactive multimedia firm based in Davenport, Iowa. Cunningham's firm supplies business-to-business software for a wide range of applications, as well as museum exhibits.

Videodata has interactive kiosks in Chicago's Museum of Science and Industry, the Shedd Aquarium and the Field Museum.

"We've been using the Toaster since day one, in just about every conceivable way," he said.

"I would suggest that if a person has the experience, the only thing the Toaster doesn't supply is the client. So if you can create yourself a niche and put together a simple demo tape showing your abilities, don't be afraid to go after the big corporate clients.

"The cost alternative for the quality you're supplying is outstanding, and they recognize that. If you're competent and have the ability to edit, to shoot and to create, go for it."

Not only can you compete with the big boys, says Ted Barszewski of Post Video Effect, but other markets have opened as well.

"Look at the small companies that have never even been able to consider videos because of the thousands of dollars that were involved. People like us are willing to do a promotional video for \$2,000 to \$3,000. We're carving out new markets that have never existed before," Barszewski said.

But even with all the new choices, there's still one thing to keep in mind, according to Eric Langshaw of Canadian Wilderness Videos.

"Do something you like and know. There are two ways of going wrong: one is that you won't make any money, and the second is that you won't enjoy yourself," Langshaw said.

"If you can enjoy yourself and just barely make a go of it, then that in itself is success. But to enjoy yourself and make money—that's fantastic!"

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

VISUAL INSPIRATIONS



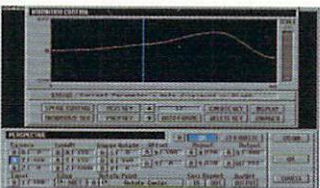
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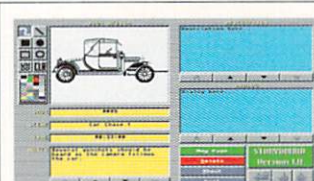
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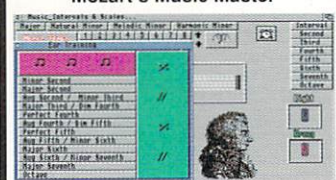
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GVP's New TBCPlus

First Video Foray a Mixed Bag

By Matt Drabick

While using a TBC with the video output from a VCR is a must with the Video Toaster, it's also a step in the right direction for building a truly professional video editing system.

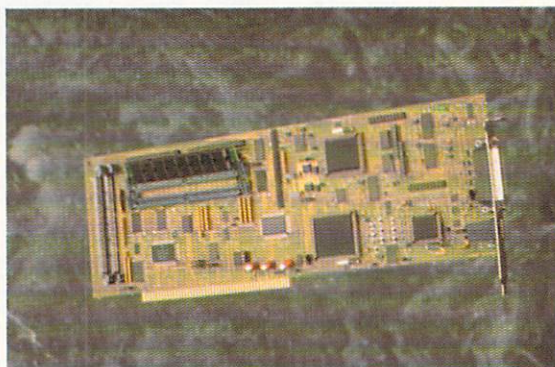
By correcting the unstable time base from your source VCRs, you will be able to switch and dissolve between sources in an A/B-roll setup without fail. With a TBC, you will find it much easier to lay graphics over stable video and your video will also hold up better when making copies. This is especially apparent when working with lower-cost videotape formats, such as S-VHS and Hi8.

With the arrival of digital, non-linear editing systems and the possible demise of VCRs dedicated to editing, the demand for TBCs eventually will decrease. However, source material is likely to continue being shot in the field using a portable VCR or camcorder for the foreseeable future.

Whether or not that videotape footage will require time base correction will depend in large part on whether the non-linear recording device has a built-in TBC. If it does not, a time base corrector will continue to be a good investment, even if you plan to buy a non-linear video editing system.

The TBCPlus (\$949) from Great Valley Products (GVP) joins a crowded field of competitors but offers some unique features, including video standards conversion and excellent overall performance. Using the ever-popular Philips digital multistandard decoding chip, the TBCPlus requires an internal Zorro-II expansion slot, Workbench 2.04 or higher and about 600K of free hard drive space. Up to four TBCPlus boards can be installed in an Amiga 3000 or 4000, while up to five units can be installed in an Amiga 2000 or tower versions of the Amiga 3000 and 4000 without using the serial port. When multiple TBCPlus boards are used, they can operate independently or with each other.

Both composite and Y/C (for S-VHS and Hi8 VCRs) video can be connected to the TBCPlus using standard BNC and 4-



"Because the unit provides full transcoding between sources, both composite and Y/C video output is simultaneously available, regardless of the input signal being used."

pin connectors. Because the unit provides full transcoding between sources, both composite and Y/C video output is simultaneously available, regardless of the input signal being used.

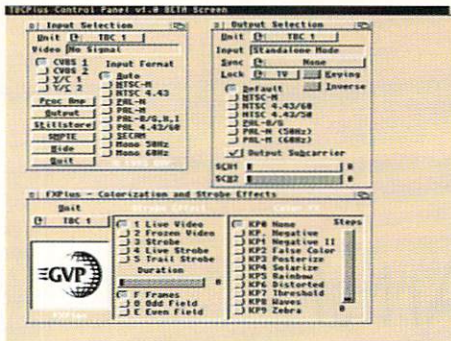
The luminance bandwidth is rated at 5.5MHz (about 440 lines of horizontal resolution) and the video signal-to-noise ratio is rated at 58dB. Two composite and one Y/C or two Y/C video inputs can be connected at the same time using the provided breakout cable. Hot switching during the vertical interval between multiple sources is possible, but the inputs should have their sync and subcarrier phase matched to each other to prevent any glitches when switching between sources.

While the TBCPlus can accept an external reference signal, such as blackburst, for timing purposes and has its own advance sync provision for connecting to a VCR, no subcarrier feedback connector is provided for working with U-Matic and S-VHS VCRs.

The TBCPlus provides full-frame or infinite-window time base correction and can work with both consumer and professional VCRs. By constantly sampling and correcting the entire frame (525 scan lines) in memory before sending it out as a fully corrected video signal, even consumer VCRs and camcorders without an advance sync input can be used. Infinite-window correction also provides for a more accurate and stable signal.

Because the entire frame is being sampled and processed, real-time framegrabs are easy. It's also possible to display, manipulate, and even load and save images. Both frames or just the odd or even fields of video can be captured and displayed. When equipped with 2 MB of VRAM, the TBCPlus is capable of capturing and alternately displaying two frames of video in memory.

Up to 8 MB of fast RAM can be added to the TBCPlus for quickly transferring video data between the TBC's framebuffer and the Amiga's fast RAM. Special software drivers, which aren't yet available, will allow ImageFX to preview, manipulate and render images using the TBCPlus. Framegrabbed and



The TBCPlus provides control over input and output selection and strobing and colorization effects.

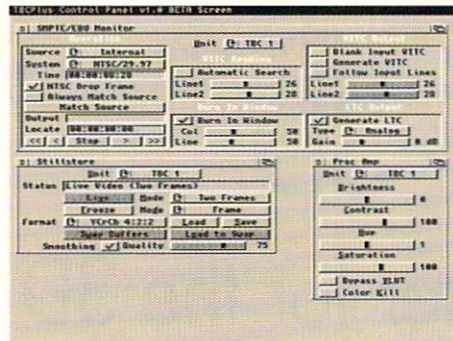
computer-generated images can be loaded and saved as IFF-24, Rendition (Caligari), JPEG, and YUV file formats.

This should allow the NTSC-only Video Toaster to be used in other countries where PAL and SECAM are used. It also provides any video producer in the United States with the ability to create videotapes locally and sell them overseas, provided that the correct VCR is available for making copies.

Real-time strobing and color special effects can be created using the provided FXPlus software control panel. Strobing can be performed using entire frames or simply the odd or even fields of the video input. Users can control the amount of delay. Color effects include negative, false color, posterization, solarization, distorted, threshold, waves and zebra with variable settings. Distorted, threshold, waves, and zebra provide unusual and powerful digital video effects, such as adding grain and smearing to the image or even creating a black-and-white image that resembles line art. Strobing and color effects can be applied at the same time.

Both an optional comb filter and SMPTE/EBU time code generator/reader are planned for the TBCPlus. The comb filter can be used with a composite video input for removing moire and edge crawl artifacts and cleaning up the signal. The NTSC/PAL time code module works with both vertical interval (VITC) and longitudinal time code at 30, 29.97 (both drop and non-drop frame), 25, and 24 frames per second. Time code can be read from a videotape or any other source or generated internally. Window dubs also can be created for off-line editing sessions.

A proc amp is included for adjusting the video, setup, hue, and saturation levels of the video input. Both the color information and the subcarrier can be removed from a video signal. Advanced features include the ability to adjust Y/C



Time code window burns are fully positionable, and proc amp controls are easily accessible.

delay, sync, and subcarrier timing, apply luminance filtering and noise reduction.

The TBCPlus has its own internal sync generator and can generate a blackburst signal for striping a tape. On-line help and extensive AREXX support are included. User-defined AREXX scripts can be assigned to any of the Amiga keyboard's 10 function keys, allowing the user to select which video input to be used.

While the TBCPlus is very good at handling time base correction and providing real-time framegrabbing and special effects, it falls short in the standards conversion department. According to GVP, when converting an NTSC video signal to PAL, a series of black lines appear at the bottom of the screen that represent the 100 additional scan lines associated with a PAL TV display.

This might be acceptable for amateur use or previewing purposes, but it isn't suitable for professional broadcast applications. Despite its many strengths, the TBCPlus is not a solution for using the Video Toaster in Europe and the rest of the world where PAL and SECAM are the broadcast standards being used.

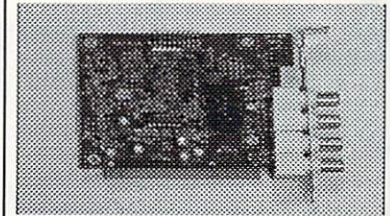
It's good to see GVP continuing to release new video products for the Amiga. With full transcoding between both composite and Y/C video sources, the ability to capture and display framegrabbed images and even load them into a paint and image processing program, such as ImageFX, the TBCPlus is an attractive package. And the fact it has real-time special effects makes the price even more reasonable.



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VTU FEBRUARY 1994

AccuTrans-3D

Object Converter for the 3D Artist

By R. Shamms Mortier

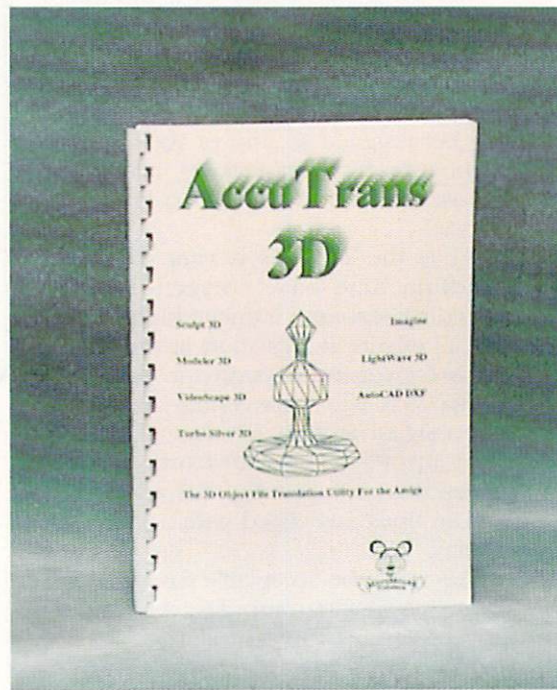
AccuTrans-3D (\$59.95), a new 3D object converter from MicroMouse Productions in Saskatchewan, Canada, reads and writes a collection of 3D object formats on the Amiga, including LightWave, Sculpt 3D/4D, Imagine, Turbo Silver 3.0, VideoScape (Binary and ASCII) and AutoCAD DXF.

Unlike its competitors, the program has no capacity to translate bitmap fonts to structured objects, which may or may not detract from its appeal, depending upon your needs. The newest version (1.6) also has a toggle that turns on a graphical interface, allowing you to see the imported object in either wireframe or shaded rendering. In this optional viewer, you can revolve the view on any X, Y, or Z axis and also zoom in on it.

How AccuTrans Works

After starting AccuTrans-3D, the first step is to select the 3D object file type that matches the object you are considering bringing in for translation. If at any point in the entire procedure you become confused, an on-screen AmigaGuide help button assists you in defining terms and processes involved. As the file is being read in, you can see the progress indicated by a table that shows the number of Blocks, Entities, Vertex, Vertices, Edges and Faces.

With all formats except DXF, a separate Preferences option exists to allow you to set various object file parameters. In the case of LightWave translations, you have control over all object colors; Diffuse, Specular, Reflection and Transparency settings; Index of Material Refraction; and Smoothing, Outline, Sharp, Outline



"It is obvious from the care taken in the manual and the sheer depth of options in this software that this is not some hacked object translator that was created to cut into the competitive Amiga market."

and Color Hi-lites/Filter settings. Most importantly, a separate button indicates turning Double-Sided on so that the object will have the best chance of having all polygons visible. If this isn't enough, you can load in a separate, previously saved set of attributes from disk.

Other file choices have their own dedicated Preference settings to play with. For instance, Imagine files can be manipulated by changing the Phong, QuickDraw, and Genlock modes as well as the Dithering, Hardness, Roughness, and Shininess settings.

It is important to access the Output Scale requester before writing a new file format. Displayed are the minimum and maximum X, Y, and Z values used in vertices and points of the model. DXF files contain 2D and 3D entities. Only the Imagine format accepts them, so a toggle is provided for switching them off, which has to be done for exporting to LightWave.

All 3D object formats allow a certain boundary for maximum values, or dimensions, of objects. AccuTrans lists these values in this requester for any format it reads and writes, and exceeding them while translating will initiate a warning flag and an aborted operation.

Here is also the place you can alter the scale between one format and the next. By using a manual input scaling factor, you could cause the translated object to be written with different scaling on

any axis. Lastly, there is a very handy gadget for altering the objects' or scenes' center point, which will make it appear in a different place when using the 3D program it is addressed to. Before moving on to the next desired 3D object file operation, the user must click on a Clear Memory button.

AutoCAD DXF Conversion

It is obvious from the care taken in the manual and the sheer depth of options in this software that this is not some hacked object translator that was created to cut into the competitive Amiga market. This is professional software meant to address professional needs. In a conversation with the author, Wayne Hogue, I learned that he originally designed AutoTrans for a friend who happened to be a professional architect with a need to import DXF files into the Amiga environment. Only later did Hogue decide to take this software to market.

AccuTrans has been tested with AutoCAD versions 10 and 11. It reads the entire DXF files, including Headers, Tables and Entities. (Headers are the general information about a drawing; Tables include Linetypes, Layers, Text Style, View, Coordinate System, Viewpoint and Drawing Manager. Blocks are entities used in each drawing block; and Entities include entity and Block references.)

A helpful section in the manual gives a complete description of the DXF file structure. Comparing this with other 3D file format descriptions should give the user a better idea of things to watch for in 3D object format conversion. There is also a section devoted to the way that a user can transfer DXF files between diverse platforms, which may be just the ticket for multiplatform users.

Although the DXF settings are not listed in the Preferences area, there is ample room in another area of the AccuTrans interface dedicated to DXF settings. Before a DXF object is loaded, you can set the DXF Points per Arc function. This tells the software that arcs of a certain degree can be configured to contain a limited number of points, which is invaluable in keeping file sizes under control. The less points an arc contains, the more blocky it will look with a zoom view in the final render or animation. Therefore, it's always a trade-off between smoothness and file size. Global points/arc also can be set in this requester. In a separate area, DXF default colors and the input scale factor also can be set.

Once a DXF file is imported, the options for file manipulation multiply. You can select/deselect Layers (the separate parts of a layered scene), Blocks (grouped elements in the scene), choose the DXF output options (output parameters for different platforms), as well as the output accuracy in decimal places from 0 to 16. The instructions for how to pro-

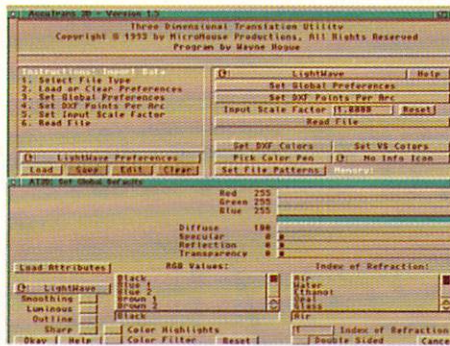


Figure 1
(Top half) The AccuTrans opening screen welcomes you to the program. (Bottom half) The Global Defaults screen.

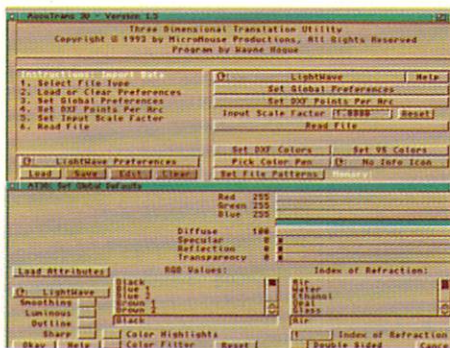


Figure 2
(Top) AccuTrans provides dozens of help screens. (Bottom left) A requester is used to set VideoScape colors. (Bottom right) Set Points for Arcs requester.

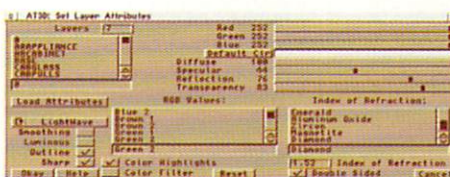


Figure 3
AccuTrans lets LightWave users address many of a 3D object's parameters.

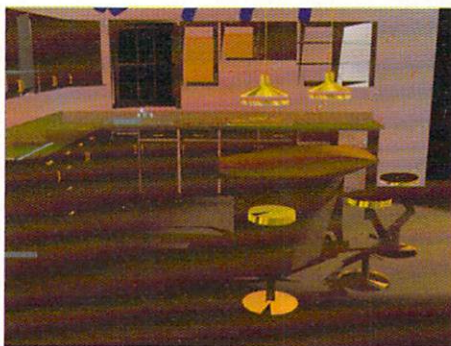


Figure 4
The objects in the rendered scene were created in the DXF format and translated to LightWave in AccuTrans. The object, while dark, is the intended architectural style.

ceed in a step-by-step fashion change to match the DXF procedure. All of this is supported by a complete Help Guide that is accessible at any time. Writing the file will then translate it to the chosen preferences and format.

The Last Translation

AccuTrans has fewer object file formats at the moment than either InterChange or Pixel 3D, but the company is considering the addition of Real-3D, Caligari, Scenery Animator and others in the near future. There is a chance that AccuTrans updates will accommodate for IBM, Macintosh, and other workstation object formats.

Its text style interface is thorough and users will appreciate the layers of options and the consideration presented by the addition of the AmigaGuide help screens. The addition of a graphical viewer option to the latest version will please users who are more visually oriented. The extensive DXF conversion routines are the program's strongest points, although all of the object formats it addresses come with extensive manipulation options on separate screens.

The manual is well written and complete with copious screen shots and an index. It is thorough in explaining the finer points of 3D-object format conversions, especially in the DXF arena. It even bothers to explain how and why it interfaces with the Workbench screen the way it does. Even if you aren't interested in such details, the overall impression you are left with is that the program was written with lots of TLC.

The LightWave interfacing is impressive. It allows users to determine beforehand what object attributes will be when rendered in LightWave itself. However, it currently does not support the addition of brush maps, textures or spline-based objects. ARexx support is not implemented at present but is planned for a future release.

If you are in the market for a 3D object format conversion program or simply want to add another one to your professional collection, include this software in your investigations. This is especially true if AutoCAD DXF files are important in your work.

VTU

Company Mentioned:

MicroMouse Productions
847 Athol St.
Regina, Saskatchewan,
S4T3B6 Canada
(306) 522-6077
Circle Reader Service No. 31

Burst Electronics VMF-2 Video Mixer/Fader

By Bob Anderson

In the course of an average day, I receive notice of several new video products in the mail. Most of the time I flip through them rather quickly, but every once in a while an item comes along that makes me really take notice.

Such was the case when I came across information about the Burst Electronics VMF-2 (\$449). One quick phone call put me in touch with company vice president Bill Kent, and I had the product in hand the next day.

This unit may be the answer for a lot of Toaster owners. It is a simple two-channel video mixer with the ability to fade to black. This allows Toaster owners to fade live video to black with a CG overlay at the same time.

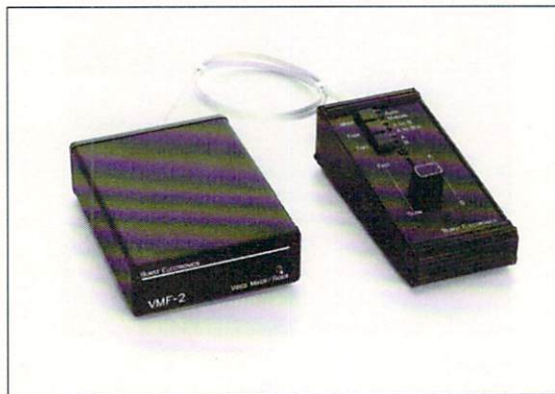
The unit consists of a one-rack-unit-tall, one-quarter-space-wide main module and a small remote unit. The main module front panel has an on/off switch and a power indicator LED. The rear panel has a connector for its external 12-volt D.C. power supply, a connector for the remote unit, video input A, video input B and video output.

The front of the remote unit has three push buttons and a slider. Each of the buttons has a red- and green-mode indicator light. The first switch toggles between auto and manual fade mode. In auto mode, the fade duration is set with the slider. In manual mode, the slider adjusts fade level. (As a knob twiddler from way back, I can tell you this slider is smooth and feels great.)

The second switch selects fade mode. You can fade from A to B or from A to an internally generated 7.5 IRE black. The unit requires that A and B sources are genlocked. This is useful as an additional input for your system. The final switch is the take button.

In manual mode, the LEDs indicate which input is selected. In auto mode, this button initiates the transition. The fade rate can be adjusted causing a fade to start slowly and increase in speed or vice-versa. Finally, the back of the remote features a GPI input, allowing the unit to be externally triggered.

The overall specs of the unit are quite impressive. The signal-to-noise ratio is 60dB; bandwidth is 10MHz at 0.5dB;



differential gain is at 0.1 percent and differential phase is at 0.1 degrees. There are internal jumpers for video termination with the inputs terminated in shipping configuration.

The VMF-2 is easy to integrate with your Toaster setup. Simply attach the Toaster's program out to the fader's A input. The B input doesn't require an input. The output of the VMF-2 goes to your record deck. You now have a master fade to black. You can fade to

black or any other source fed into the mixer regardless of how the Toaster Switcher is set up. You can fade out with the Toaster displaying CG key pages over live video or with the Toaster's luminance keyer active.

After receiving the VMF-2 from Burst Electronics and testing it thoroughly, I was convinced that this unit fills an important niche in the Toaster market. The device works exactly as advertised.

It is sturdy and could easily stand up to use in a mobile rack. Using this product is a real pleasure.

My only recommendation for improving the device would be a change to the take button; it initiates the fade while in auto mode, but doesn't take between the A and B source while in the manual mode. I mentioned this to Burst Electronics. The company said that adding the capability would be a fairly simple logic change, and that it could be easily incorporated into future versions of the device.

Burst Electronics also sells the F2B (\$249), a simplified version of this unit. That device has only the manual fader and fades only between an A source and black. This unit is not GPI-triggerable.

For those wanting a master fadeout, the Burst Electronics VMF-2 video mixer/fader or F2B fade-to-black devices would more than fill the bill.



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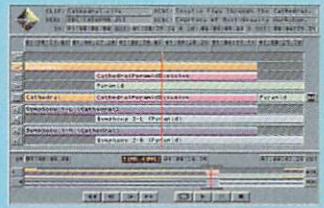
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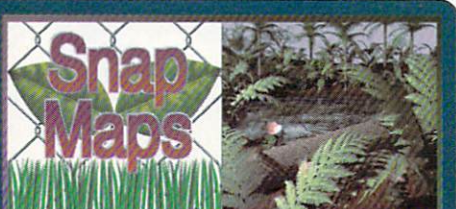


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All About Maps, Part 2

How to Apply Maps

By Mojo

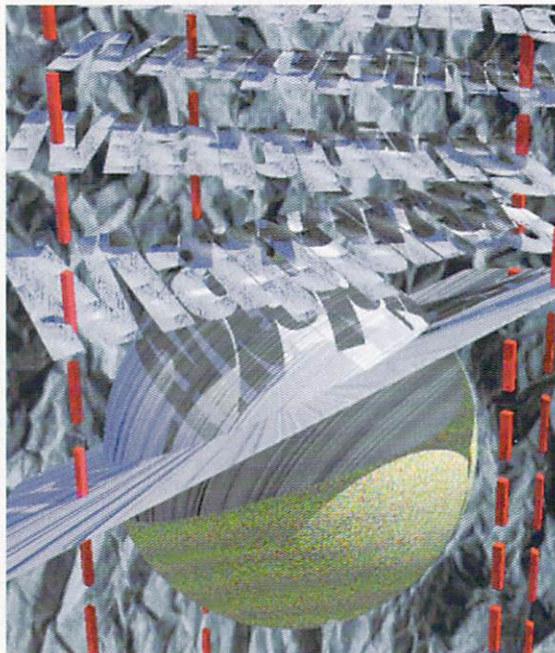
In part I of this bold new series, the importance of and ideas behind good texture mapping were discussed (see the January issue of *Video Toaster User*). For this exciting installment, mapping techniques have been collected from around the globe. Tips have been gathered from Ron Thornton and the Foundation Imaging (*Babylon 5*) staff, the well-known, yet elusive Adam Lebowitz and even a few suggestions from a Tibetan monastery where the monks believe that spiritual fulfillment can only be achieved through spherical image mapping. Last month, Toaster 2.0's splendid SpaceFighter object was used to illustrate *why* you must map. This month, it will be used to show *how* you must map. Onward!

Canvassing

Certain objects are easy to create maps for; take a table or a shoe box for instance, or perhaps even a baseball card or a refrigerator. These are simple because square shapes require square maps and your TV screens are square. Square TV translates to easy square maps. But more complex shapes, like the Sistine Chapel or a spaceship, consist of many custom shapes that require similarly shaped maps. A square canvas will no longer do—a specially shaped piece must be cut to paint on.

The SpaceFighter object consists of several distinctly shaped surfaces that must all be mapped separately. The primary surface, *FighterBody*, is more or less flat so a *planar image map* needs to be created.

First, a blank canvas in the shape of the body must be created. This can be done in LightWave. Load the SpaceFighter (or any other object you wish to map) into Layout. (For greater accuracy, load the object into Modeler first and separate the body's polygons from the rest of the fighter and load that section alone into Layout. For complex objects this may be a necessity.) Move the camera up



and away from the object and tilt it down at a 90-degree angle, so a top view of the body fills the screen from top to bottom (see Figure 1).

Keep in mind that LightWave's camera behaves very much like a real one. The default lens setting is 18mm; this is an extreme wide angle and may produce a slightly distorted image. A good idea would be to move the camera *very* far away from the object and zoom it in to at least 100mm (the more the merrier). You may even notice that the top view now looks a little flatter—more like a drawing of the object. This is good.

Make sure the object fills as much of the screen as possible so you have a large area to paint in (a small image map will show its low resolution when you move closer

to the rendered object). However, make sure it doesn't go all the way to the top and bottom of your screen. The resulting images will probably be cut off by your monitor's overscan, making them tough to work with. You can avoid this (and save some machine overhead) by creating these images in non-overscan. Simply click the Overscan button *off* from the Layout camera menu and keep the object within the safety lines.

Once the scene is ready, make the object's surface completely white. Be sure to set Luminosity to 100 percent for a uniform brightness and Diffusion to 0 percent so the object doesn't shade. Render one frame of the scene and save the RGB image to disk. This black-and-white picture is a perfectly shaped template to begin painting your map on. Note: Another way to achieve this would be to load your object into Modeler and drag the top view window out to full screen. Then, multitask any screen-grabbing program and grab the Modeler screen. Presto! A distortion-free template. Just touch it up in a paint program to make it black and white.

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template into a paint program and start creating your map. The image may only appear to be two colors (black and white), but it is a full, 24-bit file. You can load it directly into ToasterPaint or any other package that handles 24-bit images. In many cases (as with the SpaceFighter), the map can be started with far fewer colors than 16 million. LightWave allocates a little more than 1 MB for each full-screen, 24-bit file loaded, so they should be kept to a minimum or you'll

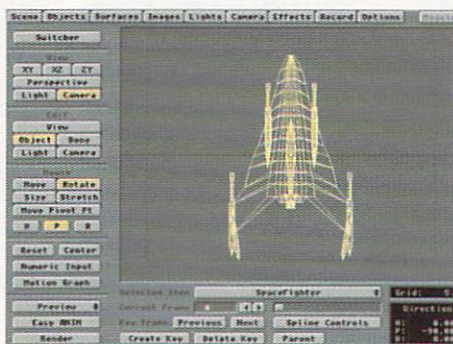


Figure 1

find all your rendering RAM eaten up.

In reality, you rarely need images with true 24-bit color. *Babylon 5* uses very few; the model of the station itself uses none. Most maps can be started in DeluxePaint. If you're not using DPaint AGA, you can convert the 24-bit template into a file with fewer colors using Art Department Professional (a necessity for the 3D artist).

The SpaceFighter's body map is a diffusion and specular map that began as a 16-color, black-and-white image of panels (see Figure 2). As explained last month, texture maps like these only need to be grayscale. It's good to start by changing the pure, white template to a medium gray, then add various lighter and darker shades. Contrast is the key to good texture maps, which are intended to break up the solid color of an object. In this case, boxes and lines do the trick. However, they could just as easily have been a custom wood texture, dirt, scratches, lettering or anything else that would add a little flair to your object. Just be sure to paint within the lines.

After the basic panels were added to this map, it was loaded into ToasterPaint where the dirt and streaks were created. These contribute considerably to the final object's realism. Eight-bit gray resolution was

needed to create smooth gradient smudges. (Note: ToasterPaint cannot currently read or write 8-bit gray images. After saving the 24-bit black-and-white files, they were converted with Art Department Pro to 8-bit gray. These files are considerably smaller than 24-bit and are recommended whenever possible.)

After you've put the final touches on your map, save it as cropped to exactly (give or take a pixel) the width and height of the original template.

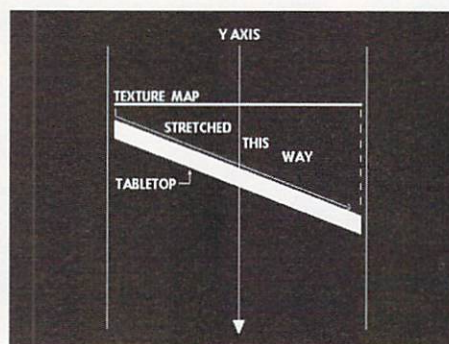


Figure 2

Otherwise, it will no longer precisely fit the object. If you're saving from DPaint, save the file as a brush and make sure you drag the brush box right to the edges of the map. It may be easier (and if you're using ToasterPaint, a necessity) to load the full-screen image into Art Department Pro and perform the operator *crop visual* (this is most highly recommended). Your map is now finished. Hurrah! Now to stick it somewhere...

Applying Yourself

Once the map is finished (assuming it has been properly created), applying it is usually quite easy. In Layout, load the map from the *Images* menu. Select the surface it was made for and click the "T" button next to the desired category of image map. In this case, it would be Diffusion and/or Specular. Under the texture sub menu, select the appropriate map and specify its type. The SpaceFighter is mapped entirely with planar image maps, and the body is mapped along the Y axis. Click the *Automatic Sizing* button and presto. The map should be perfectly adhered to the surface, fitting every contour and bump like a glove.

It's entirely possible that a map may not apply properly. A distorted template or a slightly miscropped image can show up as defects in the mapping. Unmapped areas along an edge

may appear, or perhaps the map may seem shifted to one side. This can usually be fixed by fiddling with the texture center and texture size controls in the map menu.

Let's say the map *FighterBody* appears to be shifted a bit to the left of the object. By making slight increases in the X value of the *Texture Center*, you are shoving the entire map to the right (keep in mind that left-right or X-Y-Z values are completely dependent on what axis you're

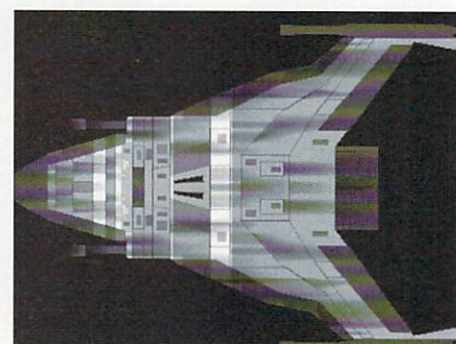


Figure 3

mapping on and what direction your object is facing). Think of changing these values as the opposite of moving your object through a stationary texture with the mouse. Instead, you're actually moving the *texture* through a stationary object using numeric values. A little tweak here and there can nudge the texture into the proper position. If you want to see what the map would look like reversed (or if the map has somehow stuck itself on backwards), simply change the appropriate *texture size* value to a negative number.

If you've improperly cropped your texture, you will very likely see what appears to be seams around your object. This is also easily remedied by altering the texture size values. Increasing them slightly will usually expand the texture enough to cover the entire object. A few tweaks to the texture center may be necessary after changing the size of the map, but few adjustments should be needed unless you've really messed something up.

A handy rule of thumb when trying to figure out which axis you should be adjusting is to forget about the one you're mapping on. Since the *FighterBody* is mapped on Y, the size and position of Y have no meaning. Everything is manipulated by X and Z values. This applies towards any axis you're mapping.

The rest of the SpaceFighter surfaces are mapped in the same fashion as described above. They may be different shapes (for different object parts) and they may be mapped on different axes, but this technique should apply for almost any form of planar image mapping. Study it well and make your mother proud.

Inevitable Problems

Nothing ever goes exactly as planned. Any 3D artist (well, at least the honest ones) will tell you there are so many variables in 3D animation that unforeseen problems are inevitable. 3D packages aren't quite yet smart enough to know what you want and all the X-Y-Z rules can get pretty confusing. Mapping itself can be particularly tricky, since maps only like to travel in straight directions and can get very fussy about how you apply them. If you try to stick a map on an object that has been saved and rotated at an odd angle in Modeler (for instance, a drafting desk) the map normally applied on the Y axis will appear streaked (see Figure 3).

How can you avoid this? Well, as stated, maps (in this case, planar image maps) are very stubborn critters. They *absolutely* insist on having a surface flush along an axis to be applied. Objects to be mapped must be saved in proper orientation and manipulated later. In the case of the drafting desk, it should be saved flat on the Z axis, loaded into Layout, mapped on Y (since that's the direction it's facing), and then rotated to the desired angle. This is a good example of why hierarchies can be so important—very often, one object must be saved in separate pieces and then parented together in Layout to insure proper mapping. However, once an object is mapped, it can be manipulated any way you want in Layout and still retain its map. Objects can be morphed, boned or displaced to kingdom-come, but their maps will always hold true (this is one way in which their stubbornness can be a bonus). In fact, morphing can be used as a technique to create a properly mapped object.

Also keep in mind that maps are applied to all polygons that share a particular surface name. If, for some reason, the surface FighterBody appears on another object somewhere in your scene, you'll never get the map right. This is why you should

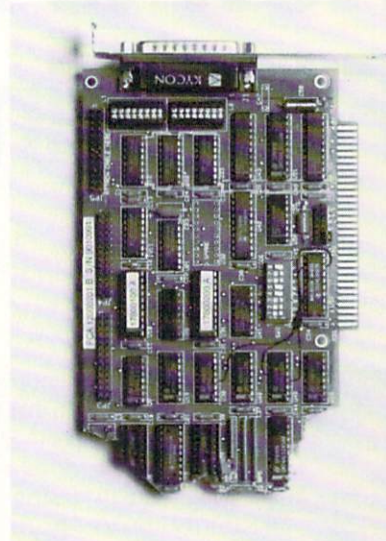
take great care to apply specific names in Modeler (as discussed last issue). Try to keep all objects except the one you are currently mapping out of Layout to make life easier. After you've finished mapping an object, be sure to save it! Mapping attributes save with the *object*, not the scene (with the exception of clip and displacement maps). In addition, you must be careful when using the new Import/Export features in Modeler.

Let's say you've spent hours perfecting a surface attribute in Layout, then decide the left wing of your object should be shorter. You switch to Modeler (which still has the object you created hours earlier), make the change and export it. You will have just lost all your mapping, since the object you just exported was never mapped. A tweaked surface has been replaced with a blank one. Think of them as two separate objects, with the Import/Export button acting like a shortcut to loading and saving. Believe it or not, careless accidents like this happen more often than you might imagine. Also be careful about reloading different versions of objects you may have created. Looking back to the SpaceFighter object for an example, perhaps you've made a bunch of cool-looking SpaceFighters—one orange and one purple, for instance. They may be saved as PurpleFighter and OrangeFighter, but you'll find that all the objects that *share surface names* will take on the attributes of the last one loaded. Make sure you change the surface name in Layout to OrangeFighterBody, etc. before you save the object. This will insure all versions of the object retain their individual mapping.

For multiple copies of an object, it's far easier to use the new *Clone Object* feature, since it leaves maps intact and also copies all motion and object envelopes (as well as helping you avoid clicking Load Object 30 times).

All this may give the impression that texture mapping is a real pain. Well, sometimes it is. But just tune in to an episode of *Babylon 5* or *seaQuest DSV* and you'll see whether or not it's worth the extra effort. Remember how good those models in the hobby shop's glass case look? Probably the only difference that ever existed between those and yours is that they spent a lot of time painting the model kit as well as building it. The same rules

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How to Fix Those Flickering Polygons

By Michael and Nicole Bushey

Have you ever rendered a LightWave animation and discovered after hours of laborious modeling and tweaking plus many more hours of waiting for the computer to render that the animated objects flickered?

Recently, we encountered that problem and, after a lot of research and effort, discovered the source of the flickering and how to fix it. If you're an aspiring LightWave animator, the few moments it takes to read this article could save you hours of frustration and sleepless nights.

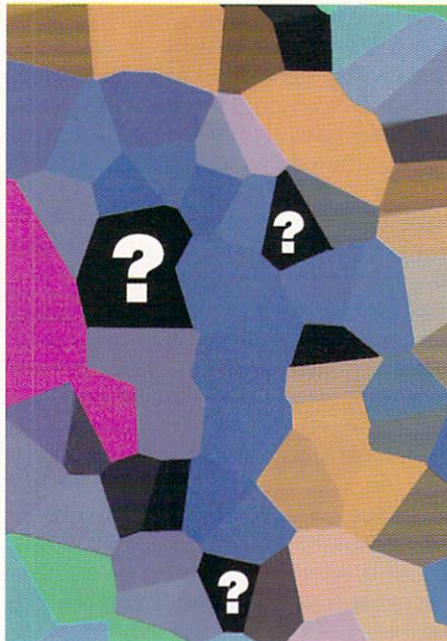
We used Modeler 2.0 to build an animated carburetor. During the 31-second animation, 50 carburetor pieces flew together. When the animation was played back some of the carburetor pieces flickered. We were shocked to see the flicker and rendered out numerous test frames in search of our problem. Each looked great.

Perhaps the problem stemmed from our reflectivity settings. We tried several different surface settings to test our theory, but the flicker continued. Worst of all, we could not tell if an object was going to flicker unless we actually rendered a portion of the animation. We tried everything we could think of to stop the flickering problem with no success.

No one else seemed to know any more about the problem than we did. Upgrading to the Toaster 4000 board and LightWave 3.0 provided us with the tools necessary to discover the source of the flicker. Finally, we learned that the flickering was caused by non-planar polygons in our objects. Once we figured out what a non-planar polygon was, we understood how to select and fix them.

Checking for non-planar polygons is an important step in the modeling process that is too often overlooked. Even if you use ready-made objects, you should understand these problems because they still apply to you. Many of the objects commercially available contain non-planar polygons.

Non-planar, degenerate, two-point and one-point polygons have the potential to cause problems. Degenerate polygons are a type of non-planar polygons. Two-point



polygons are sometimes useful but can become a problem. One-point polygons have the same problems as two-point polygons but can also cause a bug when loading your objects into Layout.

What's Non-Planar?

A non-planar polygon has four or more points that do not make up a flat plane. If you have three points in a polygon, no matter where the points are, the plane will be flat unless it's degenerate.

Once you have more than three points, you can run into problems. For example, take a four-point polygon with three of its points located at zero on the Z axis and have the other point elsewhere on Z. This is the equivalent of taking a tabletop and pulling one corner up while the other three corners stay stationary.

If you could do this without breaking the table, anything put on the table would slide off. Just as you would have

problems with this in real life, you will have problems with non-planar polygons in your computer. Polygons must be flat, otherwise there will be rendering errors. These errors appear as polygons that disappear and reappear in your animation, which can simulate flickering from frame to frame. You will also get irregular shading of your objects, such as light and dark streaks.

The theory on polygons being flat makes a lot of sense. However, when modeling complex objects it is easy to forget about subtle details while you are busy getting the job done.

There is a hard and an easy way to identify non-planar polygons. Due to our lack of knowledge about non-planar polygons at the time, we found out about them the hard way. We watched our animations flicker as the objects moved. The easy way is to use the select non-planar button in Modeler 3.0. Using Modeler to find these polygons can help save a lot of time and eliminate unneeded frustration.

One easy way to learn how to detect non-planar polygons is to load the LowTop object from the apparel directory. Click on the polygon select button and then press the W key. This will bring up the Polygon Stats menu. Now click on the + (plus sign) of the non-planar item, which is the bottom left button, to select all non-planar polygons.

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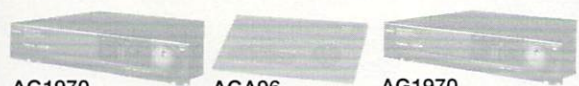


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Assuming that your flatness limit is set to 2 percent or less, you will now see more than 1,000 non-planar polygons selected. This sneaker, when animated, looks terrible. It has polygons that flash in and out, and its smoothing is abnormal. Figure 1 shows the sneaker with holes and streaking. Figure 2 shows the sneaker after the non-planar polygons were tripled.

Next, press the I key to find out the percentage of flatness in each polygon. The polygons considered non-planar

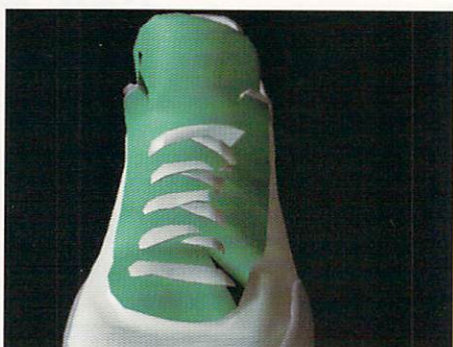


Figure 1

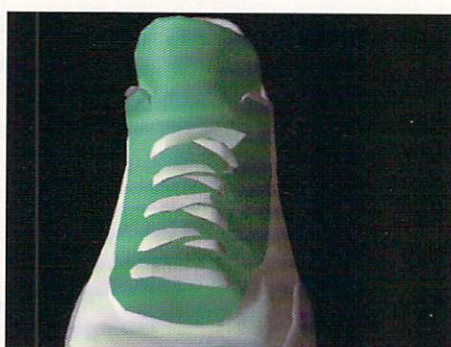


Figure 2

will have a percentage of flatness greater than the defined flatness limit. The flatness limit is entered in the Object-Options menu in 3.0 Modeler. This value is usually set between .5 percent and 2 percent. Modeler defaults to .5 percent flatness, so you do not have to worry about changing it. The larger the percentage of flatness of a polygon, the more visible the rendering errors will be.

With the new 3.0 software, it's easy

Degenerate polygons are easily detectable in LightWave because they do not render. They leave holes in objects. If you notice holes rendered in your object, you probably have either a polygon facing the wrong direction or a degenerate polygon. In Modeler, check to see if the polygon is flipped in the correct direction. If you find that it does not face either way when highlighted, you have a degenerate polygon. Figure 3 shows this phenomenon.



Figure 4



Figure 5

to fix the problems. With the non-planar polygons selected, press Shift T to triple all the selected polygons. Triple is a powerful and useful command that reduces polygons with four or more points to three-point polygons. Note that any time you plan to use bones or displacement mapping, the area of the object that will be affected must be tripled or Layout will make your polygons non-planar as it distorts them.

To check for this problem before rendering, have the Select Polygon button on and press the W key for polygon stats. Now click on the non-planar + button. Again, this will highlight all non-planar and degenerate polygons. If you want to see how many degenerate polygons you have, press the I key. You will now be able to step through the non-planar polygons that are highlighted. When the flatness reads degen-

erate, you know what you have.

To fix the degenerate polygons, merge the points. Press the M key to bring up the Merge Points function and select OK. Suddenly, the degenerate polygons will face in a direction. Double check to make sure the corrected polygons are facing in the correct direction. It is a good idea to merge points after you use the Mirror function and to clean up the object periodically. Keep in mind if you do not want all polygons to share points with their neighboring polygons,

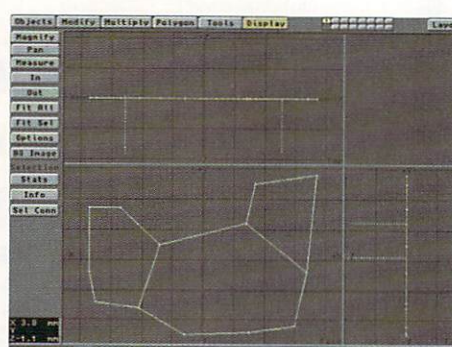


Figure 3

select only the polygons that you want to merge.

Two-point polygons are not bad polygons but can often cause problems. They are rendered as line segments, which is beneficial when creating hair, grass and similar objects. However, they pop up in unexpected places when modeling. Figure 4 is an example of an object with unwanted two-point polygons. This object was modeled using the Boolean function



Figure 6

union. As you can see there are gaps on several corners.

Boolean functions can create unexpected two-point polygons. After cutting the two-point polygons out of the object, it rendered fine as shown in Figure 5.

If you find that a seam is occurring where it shouldn't, you probably have a two-point polygon. To eliminate the problem, click on the Select Polygons button and press W for the Stats menu.

Click on + to the left of the Two Vertices box. This will highlight all two-point polygons. You may cut them out, if they are unneeded.

One-Point Problem

One-point polygons render as small dots. A good example of an object created entirely with one-point polygons is the RandomStars object in the Space directory, which comes with LightWave. Sometimes one-point polygons are confused with null objects. A null object contains only one point and is invisible because there are no polygons to render. Null objects are used for parenting objects together.

There is a bug in loading objects into Layout. This problem occurs in the 3.0 software and has plagued us several times. The object refuses to load into Layout, giving the error message "error, point XXXX Referenced in polygon," and then will abort loading (see Figure 6).

To fix the problem, load the object into Modeler. Turn the Select Polygon button on and press W for the Stats menu. Click + next to the 1 Vertex box. All one-point polygons will be highlighted. Cut the one-point polygons out of the object. Even if you do not experience this bug, it is a good idea to delete

unintended one-point polygons to clean up the object and save memory. Save your object, and this time it will load into LightWave Layout without a problem.

The Toaster 2.0 software has limited tools to fix these problem polygons. There is no practical way to correct non-planar polygons. LightWave 2.0 is unable to determine which polygons are non-planar because it lacks the definable flatness limit. Even if you manually select the non-planar polygons, 2.0 lacks the polygon tripling function necessary to fix them. Because many objects have been created using the old software, it is important to check these objects for problem polygons. The 2.0 software is capable of fixing degenerate polygons using the merge points command and can remove one- and two-point polygons just as easily as the 3.0 version.

LightWave 3.0 has made an attempt to detect and triple non-planar polygons automatically. However, this new function will not do much for you because it will only work when making primitives. As soon as you modify the primitives, you can easily make the object become non-planar. Be aware that you must still go

through the steps described in this article to correct the different kinds of problem polygons.

Checking for these problem polygons should be as much of a routine as brushing your teeth. This will save you the headaches of rendering and re-rendering animations. Remember to delete any unnecessary one- and two-point polygons to help avoid problems. In addition to rendering faster, your objects will also take up less RAM. Make sure that non-planar polygons are tripled, or you will encounter rendering errors. Using bones or displacement mapping will require that all affected polygons be tripled. Just remember, when you move points, bend objects or twist them you are adjusting points in different planes. That causes non-planar polygons.

Be on-guard for non-planar polygons. A little extra effort put into identifying and correcting non-planar, degenerate and one- and two-point polygons before rendering will fleece the frustrating flicker.

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2D Cel Animation

The Merger of Freehand and Computer Art

By Maury McCoy



cel animation has been a relatively unchanged process since "Gertie, The Trained Dinosaur" first stomped onto the scene in 1914.

Animation techniques have expanded since then to include sound in 1928 and color in 1932, but for the last 60 or so years, animation has been confined to roughly the same process.

Just as computers have touched almost every facet of our lives, it only makes sense that this wonder tool would eventually come to the aid of aspiring animators. Using the Video Toaster's improved genlock and a capable animation program, such as DeluxePaint, Brilliance or Disney's Animation Studio, the ability to output cel animations to video in a fast and profitable manner has been put in the hands of the masses.

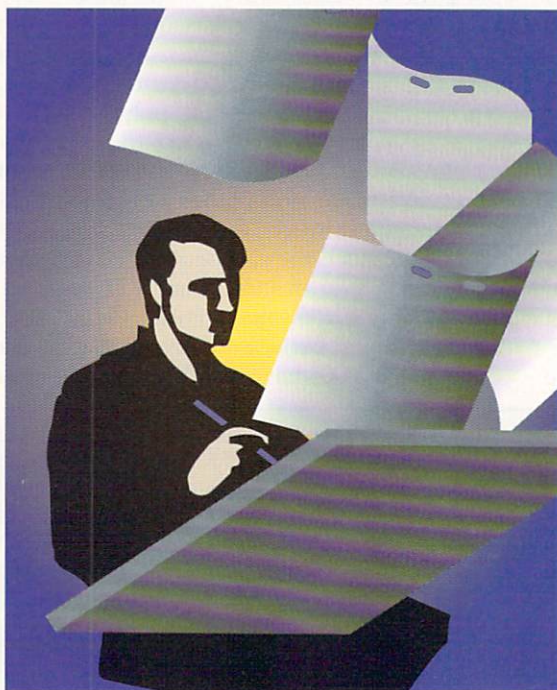
However, be forewarned. Cel animation isn't for everyone. Unlike 3D animation, in which the user can click the magic render button and watch an animation form before his eyes, not much happens in cel animation without the artist's direct input.

Chances are if you're the type of person whose high school notebook had more drawings than notes, this is the opportunity you've been waiting for.

The Way Things Were

Hand-drawn animation has traditionally been a rather tedious and time-consuming practice. Using traditional methods, the animation was first sketched on paper and transferred to clear sheets of celluloid, thus the name cel animation.

At this point the cels were individually painted by hand, placed over a painted background and transferred to film. Although this method is rather tedious, especially considering the number of frames that must be drawn, it has several benefits over animation that has been created on a computer.



First, lines drawn by hand are usually smooth in contrast to the blocky appearance of some computer drawings. Second, camera pans and zooms are easily accomplished. Probably the most significant advantage is the fact that most artists find it much easier to draw with a pen or pencil than a mouse.

A variety of drawing boards are available for the Amiga, but the relatively expensive price of quality drawing boards and the lack of software support for features, such as pressure sensitivity, has left the mouse as the tool of choice for most beginning, budget-minded artists.

Amiga Animation

Computers, however, offer a fair assortment of unique features that are starting to change the way cel animation is done. First and foremost, it is much less expensive to

create animations on a computer. Traditional methods are slow, laborious and involve many people.

Computer animation can be completed by one person in a reasonable amount of time. Brush operations, such as flipping, stretching and rotating, allow numerous aspects of the animation process to be hastened.

Although drawing images might be easier with a pen or pencil, coloring those images is definitely the forte of the computer. Not only can images be quickly colored, but with a few clicks colors can be changed at will. The ability to undo mistakes is also a comfort to many beginning animators. (Undo and changing colors aren't realistic in the ink and paint world of traditional animation.) Add to this the fact that animations can be viewed while they are being created and the option of going straight to videotape for final output as opposed to film, and it is easy to see how computers can be used to cut time and costs.

Animating for Fun and Profit!

I tend to categorize cel animation into technical animation and character animation. Technical animations include

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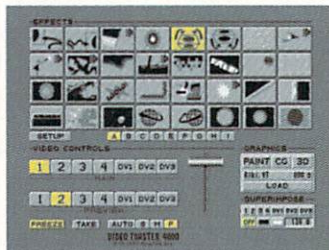
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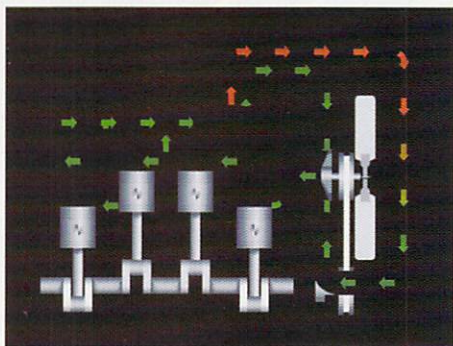
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medical, scientific, and industrial illustrations of more or less how things work. Character animations, on the other hand, are more typical of Saturday-morning, Disney-style cartoon animation. Although character animation is what usually gets most people interested in cel animation, the bread and butter of the business consists primarily of animations with a more technical slant.

Many technical animations are well-suited to being drawn on the computer, and companies that need this type of animation can ordinarily afford to pay for professional work. The accom-



Many technical animations are well-suited for the computer, such as the foreground of this engine schematic.

panying images of an animation I recently completed for Baldwin Filters is a typical example of this type of animation.

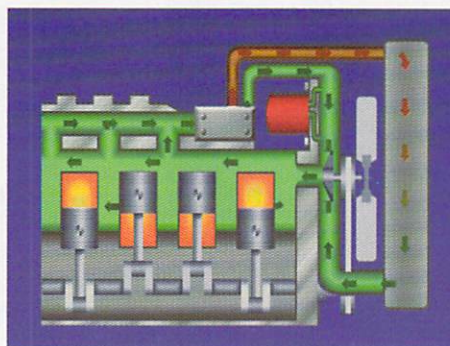
Outputting these types of animations is a relatively straightforward process. On machines that are not equipped with the new AGA chipset, animations are more or less limited to 16 colors. For this reason, a technique I often use is to key my animations over 24-bit images created in LightWave or ToasterPaint to give them a more colorful look. Using this process, I am required to draw only the objects that move on the screen. Changing either just the foreground or background is a reasonably painless task. This method is similar to the way that clear cels are layered on top of backgrounds before being photographed in traditional animation.

To output animations in this manner, enter the Toaster and load the Toaster's framebuffers with the background image. At this point, quit the Toaster and run the included genlock utility. Hitting Ctrl-F7 outputs whatever is on the Amiga's RGB display to video.

Pressing Ctrl-F8 allows you to key

this RGB display over whatever Toaster source you choose next. (Ctrl-F1 for input 1, Ctrl-F6 for DV2 etc.) After selecting the source you are going to display your animation over, (you should be able to see the Workbench screen overlaid on top of this source on the program monitor) load your favorite animation program and start creating.

When you are ready to output this animation to tape, be sure to remove the title bar and hide the cursor. In DeluxePaint and Brilliance this is accomplished by hitting F-10 and the delete key. From this point, it is as



Keying animations over ToasterPaint images allows for more colors and full overscan backdrops.

simple as playing your animation and hitting record on the VTR.

Character Animation

For those animators who feel they are getting far too much sleep or that they haven't been spending enough quality time with their computers, character animation may just be the answer. This type of animation, although difficult to master, is rewarding. Trust me when I say that watching characters you have created take life and move around the screen will justify your hard efforts.

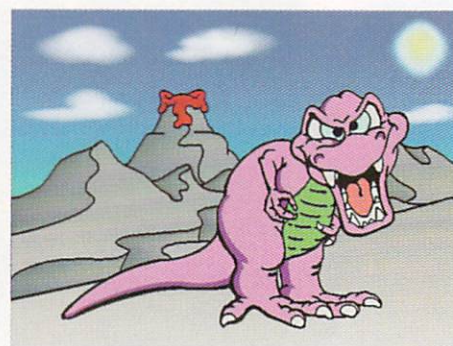
There are many different ways to go about creating animations on the Amiga, as well as there being a variety of programs available. One traditional technique that is often used is called the *onionskin* method.

This name comes from a technique whereby animators draw images on semitransparent onionskin paper, allowing them to view images that had been previously drawn underneath. By using this approach, animators can see the previous pictures and incorporate the subtle movements from drawing to drawing that when played back at full speed give the illusion of

motion. Both DeluxePaint IV from Electronic Arts and The Animation Studio from Disney offer an onionskin method of animating.

Most modern-day animators still use this tried-and-true method but now face the dilemma of whether to draw images on paper and then transfer them into the computer or create the images on the computer directly.

If you plan to transfer images into the computer, there are a few things to remember. First make sure that all the images are in exactly the same position when they are grabbed or scanned into the computer. In tradi-



A hand-drawn dinosaur that's been scanned and colorized before it's keyed over a ToasterPaint backdrop.

tional animation, each cel has two holes punched at the top which allow the celluloid to slide over pegs on the copy stand. In this way, animators could be certain that each drawing was registered correctly.

Another important factor to keep in mind when transferring images to the computer is that the images must be strictly black-and-white. Don't be tempted to use more shades of gray because the lines look smoother. This will cause nothing but headaches when you want to flood fill areas with color and are left with a group of artifact gray pixels. If your pictures aren't strictly black-and-white run them through an image processing program, such as Art Department Professional or ImageFX, to knock them down to two-color IFF images that can be loaded into your favorite animation program.

When transferring line drawings, be sure to keep your final lines thick and dark. Thin and faint lines have a tendency to get lost when transferred to the computer. That requires more touch-up later on.

Perhaps the best method of animating for people who are accustomed to

drawing freehand is to create rough sketches of images on paper and transfer them to the computer where they can be cleaned up and colorized. Cleaning up images on the computer is a fairly simple, although somewhat time-consuming, process. Once you have scanned in a rough drawing or created one on the computer, use the freeze or fix background option in the paint program to ensure that the original image won't be erased. Next choose a different color from the palette and a brush that is at least a size larger than the standard one-pixel brush. (This is easily accomplished in DeluxePaint or Brilliance by hitting the = key.) This step is important because lines that are thinner than this size will break up when output to video.

Next trace your rough image to create a smoother outline of your drawing. Don't worry about drawing on top of your original image. By freezing it, you have ensured that it can't be erased. Various tools, such as the draw and curve tools, aid in this process. A drawing tablet would be a welcome addition for those who are required to trace a large number of images.

It is important not to leave gaps between lines that would cause paint to leak out when you go to fill areas with color. After you have an image that is to your liking, set up a stencil for only the currently selected foreground color. Freezing the background and selecting clear will leave you with your cleaned-up image. This process can be repeated any number of times until you are left with a final image that pleases you. After cleaning up all the frames, be sure to save a black-and-white version of the animation before going back to add color. This saves a lot of work if there are changes later.

Tips for Aspiring Animators

There are a couple and tips that apply to both technical and character animation. For starters, avoid using the overscan area when animating. It is highly recommended that you stick with a 640-by-400 high-resolution display. Animating on screens larger than that occupy enormous amounts of memory. By not using the overscan area, the computer has about one-third fewer pixels to store and track.

If it is necessary for a character to walk off the edge of the screen, there is one trick that might keep you from

being forced to use an overscan-sized animation. When creating a background image in ToasterPaint, create an image of a rock, building, or something that your character can walk behind before he gets to the overscan area. Creating the illusion of a character walking behind something is as simple as going to the frames where they overlap and erasing the parts of the character that would normally be hidden by the foreground object.

Another concern when outputting to video is the color levels of your images. It is a good idea not to max out colors to their highest possible output level. Keeping colors at about 80 percent of their maximum potential should ensure that colors won't shimmer or crawl too much.

It's also important to remember another rule of thumb. Avoid color dithering at all costs. Not only does this cause annoying moire patterns when outputting to video (an effect commonly seen when newscasters wear ties or suits with finely detailed patterns), but it also can cause playback speeds to be slower.

Amiga animation programs use a technique known as delta compression to save animations. This method only saves the differences between subsequent frames of animation so that the computer isn't required to waste its time updating areas of the screen that don't change. For this reason, things that would cause the screen to have a greater amount of change between frames, such as scrolling backgrounds and dithering patterns, should be avoided. A larger amount of change between frames results in file sizes that are larger and playback speeds that possibly can be slower.

Set your frame rate to the maximum 30 frames per second when creating animations. If a certain section needs to play slower, just add duplicate frames in those areas. (Remember that anims only save the difference between frames so duplicate images take up virtually no memory.)

Most importantly, allow the computer to do most of the work. Learn how to use the Move or Tweening requester in your particular paint program and use it in combination with anim-brushes to move walking characters, spinning wheels, and other things around the screen. Computers don't mind the extra work (and spending a couple of hours reading your paint

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SENNHEISER

MKE-300 Short Shotgun

- Lightweight electret condenser mic to support the excellent video capabilities of most camcorders with the superior audio they deserve.
- Ideally suited for mounting on camcorders with an integrated shoe assembly and an extremely lightweight compact design.
- Tight, supercardioid polar pattern has the ability to pick up only those sounds that correspond to the scene being filmed and rejects any disturbing ambient noise.
- Integrated wind screen virtually eliminates handling and wind noise.
- Operating time of over 200 hrs. using its own built-in battery so will not put added strain on your camcorders already limited power supply.....***189.95**



K3U

Handle and Powering Module

- At the heart of the Sennheiser electret condenser microphone system is the K3U handle and power module. Also known as the "Universal" module it features an on/off switch with battery test position and a 3-position low frequency roll-off filter. The internal 5.6V battery supplies the required power when no external source is available

MKE 2

- High quality omnidirectional clip-on lavalier microphone
- Open, natural sound plus extremely small size (less than 1/4" diameter, approx. 7/16" long)
- Unique among its kind, it's used by every major TV network, Broadway theatre, and wherever other clip-on lavalier mics are conspicuous by their fairly large size.
- Available in 6 varieties and can be used hard-wired or in conjunction with wireless transmission systems.
- May also be used as a clip-on instrument mic
- Supplied with two single-microphone tie clips, safety-pin clip and two windscreens
- Applications include: stage, studio, commentary, news gathering, film and video productions.

ME 40

- Supercardioid pick-up pattern with pronounced unidirectional characteristic
- Its tight directional pattern helps isolate desired source from surrounding noise and reverberation
- Applications include: studio, commentary, interviews, dubbing, musical recordings, P.A. systems

ME 80

- Short Shotgun Mic Capsule
- Combination of supercardioid at low frequencies, and shotgun above 2,000 Hz
- Excellent on-camera or handheld mic for ENG/EFP.
- Increased gain before feedback by using as a podium mic in sound reinforcement
- Applications include: studio, commentary, interviews, sporting events, film and video productions

lowel

VIP (V-light, i-light, Pro-light) VIDEO LIGHTING SYSTEM

Lowel's VIP system of high-output, low-wattage lights takes full advantage of today's video cameras to help make high-quality, low-budget shooting a reality. Designed specifically for the video industry, they are capable of 55 to 500 watts of power, can be powered AC or DC, camera or stand mountable. They are all convection cooled and some have adjustable light beam. They are the winners of the Gold Medal SMPTE Award and the AMPAS Technical Achievement Award

V-light

- Efficient enough to light a small room yet small enough to fit in a large pocket, the V-light can be used as a broad, key light, back light or fill light (with umbrella or gel.)
- Extreme wide-angle multi-use halogen source
- 500 watt, AC powered light
- Can mount on stand, clamps, boom, wall, window or door-top.

i-light

- The tiny, battery powered i-light provides essential fill light, eye-light, high-lights, and contrast control in news and documentary shooting without overwhelming ambient light.
- Multi-use halogen source
- 55 or 100 watt, DC powered light
- DC power can be 12 or 14 volts.
- Includes cigarette lighter connector or optional 4-pin and 5-pin XLR connectors
- Optional light controls include expandable barn doors, scrims, diffuser, dichroic filter, snoot and umbrella, gel-frame and flags.

Pro-light

- The tiny-versatile Pro-light can be used as a low-level key or accent light, fill light (with diffusion), backlight or background light.
- Multi-use halogen focusing source
- 125 and 250 watt AC powered light or 100 watt at 12 volts, 200 watt at 30 volt DC powered light
- Optional light controls include expandable barn doors, scrims, diffuser, dichroic filter, snoot and umbrella, gel-frame and flags.
- Optional cigarette, 4-pin and 5-pin XLR connectors.

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AG-460

2-CCD S-VHS Camcorder

- Two 360,000-pixel CCD image sensors
- 470 lines horizontal resolution & superb color reproduction
- Laminated amorphous video heads
- Hi-Fi audio with stereo zoom microphone
- Two-speed 10x power zoom lens
- Piezo auto focus (TTL) with 3-step focus zone
- Sensitivity switch (0 db, +18 db, AGC) helps overcome lighting deficiencies
- Advanced auto-tracing white balance with manual override
- Automatic iris with manual override
- Variable high-speed electronic shutter
- Audio level control with LCD level meter
- Audio/Video insert editing and dubbing capabilities
- Audio out select switch (Hi-Fi/Normal/Mix)
- Versatile editing facilities: S-Video Out terminal/Adaptor terminal/Synchro Edit/5-pin Edit terminal/Edit switch
- Includes Panasonic metal system case

AG-3

3-CCD S-VHS-C Camcorder

The AG-3 is an industrial 3-CCD camcorder. Don't be fooled by its size. It delivers extra precise color reproduction in addition to its excellent mobility making it ideal for almost any professional application. The AG-3 utilizes technology and engineering used in Panasonic broadcast cameras. A few examples: the capstan motor is coated with evaporated diamond-like carbon to provide the optimum smoothness/friction balance for positive traction and uniform tape tension. The AG-3 features high performance laminated amorphous pro heads which are far superior to those of conventional ferrite heads. The AG-3 uses a newly-developed 8-group/10-piece lens system that includes two double-sided aspherical lenses (4 sides). It is highly resistant to aberrations caused by flare, color fringing and other distortions that diminish contrast.



Features:

- Three 1/3" CCD image sensor system delivers over 530 lines of horizontal resolution
- New 10:1 2-speed zoom lens (see above) 6-60mm F1.6 with automatic and manual zoom. Also features 20:1 digital zoom.
- High resolution color viewfinder lets you preview and shoot scenes exactly as they are
- Built-in digital TBC (Time Base Corrector) eliminates jitter and skew and assures stable, distortion-free playback
- **Digital Mix** – for soft fade-over between memorized still and moving images
- **Digital Still** – lets you freeze a particular scene for as long as you like, without interrupting sound recording
- **Digital Gain-Up** – delivers clear, distinct images in low-light levels, even down to 1 lux!
- **Digital Strobe & Digital Wipe** – add professional effects to your shooting

FutureVideo

EC-1000 PRO

- EC1000 PRO is a stand-alone, cuts-only control track edit controller. Controls any two machines with Panasonic 5-pin and/or Sony Control-L serial editing terminals.
- 5-digit LED display (hours/minutes/seconds)
- Up to 9 scenes can be stored in memory and then executed automatically.
- Built-in GPI trigger fires at edit pre-roll and edit out points. Can be used with any SEG (Special Effects Generator) with GPI input like the Video Toaster, WJMX-30 or WJMX-50.

EC1000 PRO MKII

EC1000 PRO MKII has all the features of EC1000 PRO Plus:

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

EC1000 PRO/TC MKII

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

EditLink 3300

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

Panasonic

Broadcast & Television Systems

AG-455

2-Hour S-VHS Camcorder



- S-VHS system – records and plays back over 400 lines horizontal resolution
- Laminated amorphous video heads assures exceptional picture quality, high resolution, superb color reproduction, and high S/N signal-to-noise ratio
- 12:1 power zoom lens with continuously variable speed zoom
- Hi-Fi stereo and linear track for recording. Also has "Audio Out" select switch for Hi-Fi/Normal/Mix combinations
- High performance stereo zoom microphone features three different settings: Wide, Telephoto or automatic zoom.
- Built-in VITC (Vertical Interval Time Code) time code generator gives absolute address to each frame of video for frame accurate editing (with specific edit systems)
- **Digital Effects:**
 - Digital Mix** – for soft fade-over between memorized still and moving images
 - Digital Tracer** – to add an after-image effect to moving subjects
 - Digital Still** – lets you freeze a particular scene for as long as you like, without interrupting sound recording
 - Digital Zoom** – Thanks to digital processing, you can enjoy shots with ultra-high magnifications of up to 100:1
 - Digital Gain-Up** – delivers clear, distinct images in low-light levels, even down to 1 lux!
 - Digital Strobe & Digital Wipe** – add professional effects to your shooting
- Audio/Video Fade-In and Fade-Out for smooth, professional scene transitions
- Automatic Iris plus manual control for fine adjustment
- Variable high-speed shutter from 1/50 to 1/8000 second.

AG-1970

S-VHS Hi-Fi Editing VCR



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

WJ-MX30

Digital A/V Mixer



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

Features:

- Combination of 7 basic keys can create 108 different wipe patterns.
- Two-channel digital field synchronizer allows special effects in each of the WJ-MX30's A/B program buses.
- Automatic Take button with adjustable transition rates.
- Wipe boundary effects: soft/border 18 matte colors available.
- Can fade to and from white, black or any of eight matte colors.
- Automatic fade button with adjustable rates.
- Picture-in-picture function allows the B-bus picture to be compressed in selectable 1/4, 1/9, 1/16 size of a full screen
- Digital effects including strobe, still, mosaic/scramble, negative/positive, paint, monochrome, and AV synchro.
- Double picture-in-picture function compresses both A and B sources. Plus every mode can be trimmed with hard/soft edges borders, shadow, shadow and border.
- Joystick positioner allows moving wipe location.
- Audio Follow allows audio mix to be synchronized to A/B rolling.
- Video, Audio and Titles can be individually or synchronously faded.
- Has eight separate memories that enable virtually instant recall of frequently used effects.
- Color controller enables adjustment of color in images from A or B bus.
- Built-in four channel audio mixer with four audio level adjustments. Also has visible LED audio level meter.

JVC GY-X2

3-CCD S-VHS CAMCORDER

- Three 1/2" CCD image sensor delivers 650 lines of horizontal resolution
- New micro-lens technology provides exceptional sensitivity of F7.0 at 2000 lux and new 10LUX mode lets you shoot with almost no light! Now you can shoot superb footage with excellent color balanced at a mere 3 lux illumination
- Variable Scan View allows flicker-free shooting of a computer monitor.
- Quick Record Mode - when turned on the camera is set to the auto iris even if lens is set at manual. Also activated is (ALC) Automatic Level Control and EEI Extended Electronic Iris which provides both variable gain and variable shutter. Now you can shoot continuously from dark room to bright outdoors without having to adjust gain, iris or ND filter.
- Full Time Auto White circuit lets you move from incandescent to fluorescent to outdoor lighting without changing white balance or the filter wheel.
- Genlock input allow synchronization with other cameras.
- Dual output system allows camera output to be connected directly to an external recorder

SONY

PROFESSIONAL S-VHS SYSTEM

SVP-9000

S-VHS Player

and

SVO-9600

S-VHS Player/Recorder



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

They both feature:

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

Optional Interface Cards:

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



NRG 970 Power-MAX



The 970 Power-MAX is designed for power-hungry professionals who have high-current draw situations and long run times.

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

VARI-LITE PRO Professional DC On-Camera Light

Thanks to on-board control IC's using NRG's Light-Gate technology, light intensity can be infinitely adjusted by the user within a range of 10% to 100% of the lamp's rated power. Now you can instantly adjust light output to exactly meet changing light requirements, all without changing hot bulbs or fusing with power resistor diffusion filters. Best of all, the Vari-Lite Pro virtually eliminates color shift and dramatically conserves precious battery power by using only the power required for the selected light level. Accommodates bulbs from 20W to 200W DC.

- Prismatic Pyrex dispersion grid provides smooth even light output and reduced glare without changing light intensity.
- Sturdy all-metal click tilt mounting bracket with unique ratchet action. Eliminates shake during action shooting.
- Front retainer assembly pops off for instant bulb access without the bother of screws.
- Rugged milium aluminum light head disperses heat and provides years of service under adverse conditions.



Power Station Series



Designed to replace expensive original-manufacture AC power supplies, the affordable Power Stations deliver precisely-regulated 12-volt DC power from AC sources worldwide. High-current capability allows for powering not only large camcorders, dockables, decks, and cameras, but lights, monitors, and other high draw 12-volt equipment as well. The stations provide up to 8 amps of precisely regulated DC power eliminating the need for battery power in stationary applications where an AC source is available. The Power Stations exceed all original manufacturer performance specifications.

- Available in different configurations: The 12560 features a single cigarette or 4-pin output and up to 5 amps of output current. The 128100 features dual outputs in any combination of cigarette or 4-pin and 9 amps of output current capability.
- High-current output
- Worldwide voltage selection
- Rugged steel case
- 4-pin or cigarette lighter outputs
- Lighted power switch

Power Station-2 Series



Just plug the PowerStation-2 into any AC outlet in the world and out comes perfectly regulated 12-volt DC power through four 4-pin XLR connectors and one cigarette lighter connector. It uses an advanced pulse-width-modulated power supply which allows for ultra-light weight and small size. It operates with little heat even at full output. The PowerStation-2 is the ultimate multiple-output professional power source for cameras, decks, lights, monitors, and a host of other video accessories.

- 85-264 volts worldwide auto-adjusting input.
- Fully protected from overcurrent and over temperature.
- Ultra-light weight - under 3 lb.
- Outstanding 300,000 hour mean time between failure is far in excess of any other manufacturer.
- Ultra-efficient PWM regulation generates far less heat than linear type supplies.
- Provides the ultimate in performance and reliability in a universally compatible and compact package.

NEW! Canon L2

INTRODUCING THE NEW CANON L2 Hi-8 CAMCORDER WITH VL MOUNT FOR INTERCHANGEABLE LENSES, RC TIME CODE AND DIGITAL EFFECT FOR UNLIMITED CREATIVE FREEDOM.

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



SONY

EVW-300 PROFESSIONAL Hi-8 3-CCD CAMCORDER

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

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



BTS

Betacam

SP-2000 PRO Series

PBC 2600 Player

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

PBC 2650 Player with Dynamic Tracking (DT)

Same as PBC-2600 plus—

- Dynamic Tracking (DT) provides broadcast quality noiseless playback within -1 to +3 times normal speed

PBC 2800 Player/Recorder

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

TOSHIBA

TSC-200

3-CCD Hi-8 Camcorder



- Three 1/2" CCD chips mounted with spatial offset technology delivers superb resolution of 700 horizontal lines
- Low noise design provides extreme sensitivity of F8.0 at 2000 lux. Minimum illumination is 7.5 lux with excellent color reproduction
- New LNA (low noise amplifier) delivers a S/N (signal-to-noise) ratio of 62dB - the highest achieved for this type of camera
- 26-pin connector outputs Y/C or component video signal allowing hook up to a portable S-VHS, MII or Betacam recorder and simultaneously record with Hi-8
- Quick-start 1.5" viewfinder needs no warm up time so you never miss a shot. Zebra pattern in the viewfinder alerts operator to excessive video levels.
- Linear matrix circuit employed to color mask the pure RGB signals output by the CCD so color reproduction is exceptionally faithful.
- Genlock capability allows synchronization with other cameras. Also full calibration functions are built-in as well as color bar generator.
- Variable high speed shutter from 1/60 to 1/2000 second
- Built-in 8mm time code generator records an absolute address to every frame. Provides precision editing of ±0 frame accuracy
- Has AFM audio channel separation characteristics for professional quality post-production.
- High-performance back electret condenser mic records to all three audio tracks. Low cut filter that eliminates wind noise
- Sports very low power consumption. The TSC-200 draws only 16 watts per hour allowing 100 minutes of recording time with a single NP-18 battery.
- Camera body is made of magnesium alloy previously found only on broadcast cameras. Still, lightweight at only 13 pounds in standard configuration.

MICROPHONES

NADY

151 VR Wireless System

- Puts the microphone "where the action is" for professional quality audio on your tapes
- Operates on VHF High-Band Frequencies for interference free performance. Two frequencies available.
- Nady's patented Companding Circuitry gives you crisp, clear sound without overload distortion or background hiss. Dynamic Range over 110 dB.
- Compatible with all camcorders and video cameras
- Range is 250 ft. Line-of-sight up to 1500 ft.
- Works with all camcorders having an audio input
- 151 VR/LT lavalier system 109.95
- 151 VR/HT handheld system 129.95

351 VR Wireless System

- The new 351 VR is compatible with virtually all camcorders and video cameras, and delivers sound that is every bit as good as the best hardwired mic.
- Ultra compact receiver - using new technology the receiver is no bigger than an audio cassette and connects instantly to any camera's external mic jack. Attaches either with shoe mount or belt clip both provided
- Both handheld and lavalier transmitters feature transmitter and audio ON/OFF switch, level trim and low battery LED
- Unparalleled dynamic range of 120 dB to ensure a soundtrack with no background hiss or overload distortion.
- Available in four factory installed frequencies from 170-218 MHz allowing simultaneous operation of up to four mic systems in the same location.
- 351 VR/LT lavalier system 164.95
- 351 VR/HT handheld system 199.95

SHURE

M267 Production Mixer

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

SAMSON®

WE ARE THE WIRELESS FUTURE™

MR-1 Wireless System

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

Lavalier (clip mic) Systems

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

Hand-Held Systems

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

SONY

ECM-44B Omnidirectional Lavalier

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

ECM-77B Omnidirectional Lavalier

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

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TOASTER PERIPHERALS



TBCard/II

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



IVT-7

DIGITAL TBC/FREAME SYNCHRONIZER

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

The KitchenSync

Dual Channel TBC

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

RGB COMPUTER



with Amilink VT-4000 Software

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

Machine Control

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

Edit List Management

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

Editing Control

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

Edit Modes

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

Toaster Control

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

SUNRISE INDUSTRIES

AD 516 and Studio 16

The Complete Digital Audio Solution

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

SANYO GVR-S950

S-VHS Single Frame Recording VCR

- Single-Frame Animation Controller eliminates the need for separate or computer plug-in animation controllers. Uses industry-standard protocols, making it compatible with most popular graphic and animation software packages.
- SMPTE Time Code Generator and Reader with Built-in Drop and Non-Drop Frame Read/Write is fully programmable from an external computer and resettable from the front panel.
- Video and Audio Switcher with Two independent Video and Audio Channels. Each video channel contains both composite and S-Video inputs. Each audio channel contains two linear and two Hi-Fi inputs. Switching can be performed either manually, or under RS232C or RS422 control. Video and audio channels are switched independently giving the GVR-S950 the ability to perform break-away edits.
- Auto-Sensing Single RS422/RS232C Input eliminates the need for optional external interfaces. Interface requirements are automatically sensed and adjusted within the recorder.
- Input and Playback Video Processing allows adjustments to the video level of the incoming signal.

NewTek

VIDEO TOASTER 4000



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

Production Switcher

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

Additional Features:

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

Luminance Keyer

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

Frame Grabber/Frame Store

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

ChromaFX Color Processor

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

Digital Video Effects

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

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

Character Generator

ToasterCG creates YIQ-encoded, 35ns (nanoseconds) high-resolution titles. ToasterCG makes adding text to your presentations simple. Among the many powerful tools included are:

- Giant library of more than 250 PostScript fonts
- Can size fonts from 10 lines to 400 lines tall
- Variable outline and shadows
- Variable speed crawling and scrolling of text
- Easily adjust color, shadow type, outline style and font selection on a line, word, or character-by-character basis

ToasterPaint

Everything you need to create or alter true-color images tailor-made for your presentations is included in an uncluttered friendly interface. ToasterPaint makes importing and modifying files from the CG and frame grabber easy. It also gives you the capability to merge images captured in the Toaster's high quality digital still store or retouch those images with incredible realism.

Dual Frame Buffers/Genlock

These are 24 bit (16.8 million colors) frame buffers with composite output that meets the most stringent requirements for broadcast video. Because there are two frame buffers, one can be loading while the other is shown on screen for seamless live presentations. Toaster effects can be done between live video and either buffer, as well as between the buffers themselves.

Lightwave 3D

The Ultimate 3D Rendering and Animation System for Broadcast Graphics

LightWave 3D offers all the high-end features you need to produce true network-quality graphics. Model, render, and animate videos in full broadcast resolution and 16.8 million colors. Everything from flying logos, scientific visualization and the most sophisticated effects seen on broadcast television are now on your desktop.



DPS DC-2350

Personal Component Adapter

- The Personal Component Adapter is a combination 3-Line Adaptive Digital Comb Filter Decoder and Y/C encoder designed for use with the Video Toaster.
- Equipped with three S-Video inputs which are converted to Video Toaster input feeds. This allows devices such as TBCs and VCRs with S-video output to be connected directly to the Video Toaster.
- Has two S-Video outputs plus switchable Betacam/MII component output which allows the Video Toaster to be connected to Y/C monitors, S-VHS, Hi8, Betacam and MII recorders.
- Its 3-line Adaptive Digital Comb Filter provides superior diagonal luminance resolution compared to products using two-line comb filter designs.

DPS VM-2000

Personal V-Scope

The DPS Personal V-Scope is the world's first Waveform Monitor and VectorScope for desktop video. It is designed to give your system the power, look and flexibility of broadcast quality hardware, but at a software price.

Features:

- The Personal V-Scope produces a digitally synthesized Waveform Monitor and VectorScope display which can be superimposed onto any video signal.
- A Plug-in card with control software it works in both Amiga and IBM PC compatibles.
- Any NTSC video signal can be input into the V-Scope which provides a buffered video output, a superimpose (software controlled) video output, and a full-time Waveform/Vector Video output.

DPS VT-2600

Personal TBC IV

The Personal TBC IV is the latest in a series of innovative desktop video products from the company that invented the Personal TBC.

Features:

- Component digital transcoding provides S-video input and output. Digital 4:2:2 processing ensures the cleanest possible picture. Composite video signal is also enhanced by a newly developed chrominance comb filter.
- It interfaces virtually any camcorder, VCR or laser disc player to production switchers or computer video systems like the Video Toaster.
- Special features include Rock Solid Freeze (both field and frame), GPI Freeze, Variable Strobe, Forced Monochrome and Advanced Sync.
- Film Effect Strobe Mode - This feature simulates the 3-2 pull down conversion technique from a 24 frame per second film standard, to a 30 frame per second video standard.
- Can be installed in any Amiga 2000/3000/4000 series or in IBM PC-compatible computers. Includes Amiga and MS-DOS control software.
- Exclusive feature of the TBC IV is the 50-pin CVE (Component Video Exchange) port. When this port is connected to a DPS Personal Animation Recorder you can capture and record real-time video on the animator's dedicated hard drive. This combination is ideal for rotoscoping and other video capture processes.
- Fully compatible with TBC II, III and Personal V-Scope. The TBC IV is operated via software, or by using an optional DPS RC-2000 multi-channel desktop controller.

DPS DR-2150

Personal Animation Recorder

The DPS DR-2150 Personal Animation Recorder is designed to record computer animation sequences directly to a hard drive and then play them back in real time. The DR-2150 is a card that plugs directly into an Amiga expansion slot and replaces both the single frame record VCR and the single frame controller.

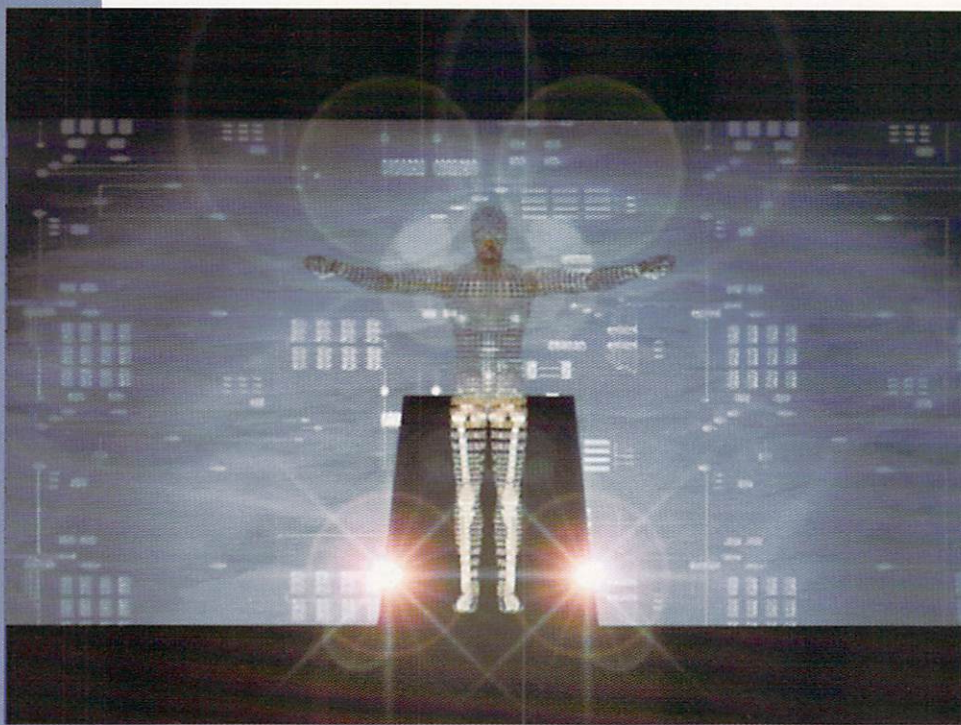
Bad edits, missed frames, tape dropouts and other mechanical glitches common to traditional VCRs are a thing of the past with the Personal Animation Recorder.

Features:

- Combines custom ICs and a proprietary implementation of the LSI chip set enabling component 4:2:2 digital recording to a dedicated hard drive.
- Variable speed playback lets you play back 24-bit (16.7 million colors) animation in real-time 30 frames per second, or you can choose a lower frame rate to play back animations in slow motion.
- Has composite, S-Video and component (Betacam/M II) outputs. Also includes a genlock input which enables it to be easily integrated with virtually any video production system.
- Supports direct rendering of all common image formats including 24-bit IFF and Video Toaster frame store files and is fully compatible with all popular animation packages including Morphus, Lightwave 3-D, Fractal Pro, Imagine, Vista Pro, and Cinemorph.
- Real-time video capture for rotoscoping and other video capture applications is possible when the Personal Animation Recorder is used in combination with a DPS TBC IV card.
- Currently system requires a Seagate ST-3600A 540 MB IDE drive. The ST-3600A provides the consistent data transfer at the rate required by the Personal Animation Recorder. Recording times vary depending on image complexity but four to five minutes of high quality playback is typical for the drive.

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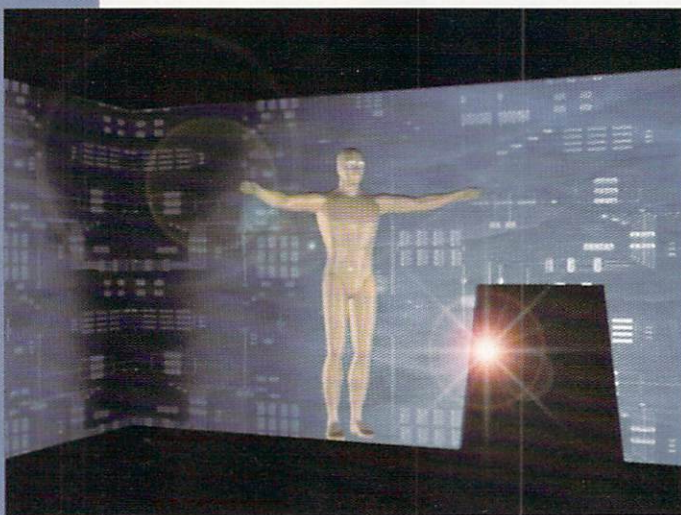
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▲ Michael J. Halsey

These three frames were used for the opening scene of a 30-second, virtual-reality animation. They are comprised of custom objects, images from the *Humanoid* set, and multiple texture maps.

Each was completed with a Video Toaster 2000, a GVP '040 and 14 MB of RAM. They each took 35 minutes to render.

Based in Nashville, Halsey runs Magnetic Dreams. He can be reached at (615) 885-6801.



Rommel D. Whitfield

Air Attack (left) was created with the Amiga 2000, Video Toaster 2.0, an R.C.S. '040 card and 14 MB of RAM.

Whitfield is a graphic artist based in Massillon, Ohio. He can be reached at (216) 837-7971.

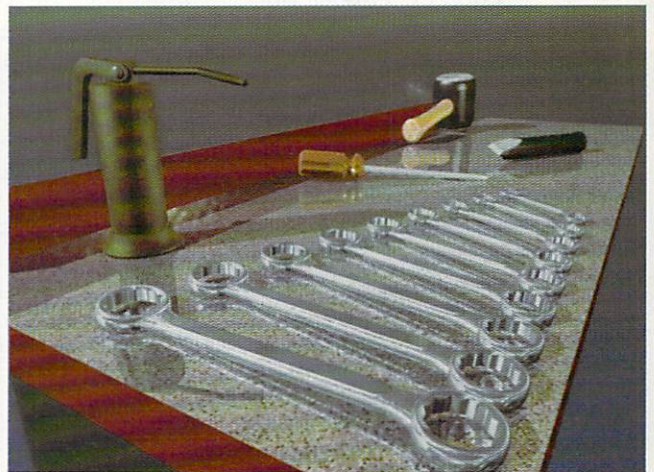
Nathan L. Wahl



In 24-bit RGB format, *Wrenches* (top) uses over 15,000 polygons and was rendered in four and one-half hours. It was completed with an Amiga 2500, an '030 and 12 MB of RAM. All the objects were created by Wahl with LightWave and Modeler 2.0.

Also in 24-bit RGB format, the *Courtyard* (below) image is a set-to-scale rendering of an actual location. It uses 26 surfaces and over 22,000 polygons. The sky is captured video. The entire image took over eight hours to render.

Based in Oak Harbor, Ohio, Wahl presides over Emerald Video, an animation and graphics studio. He can be contacted at (419) 898-0535.





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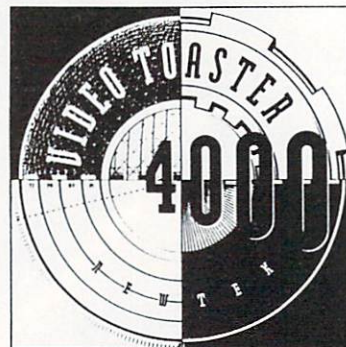


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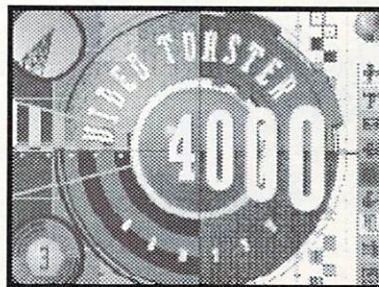


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All About Maps Continued From Page 103

apply here. Spend some time painting your objects and yours may very well end up behind that proverbial glass case.

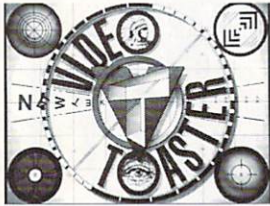
Epilogue

Perhaps you noticed that the texture map menu contains references to strange things called Cylindrical map and Spherical map, not to mention the countless others not even hinted at in this installment. Yes, there is plenty more to cover. Lots of different mapping fundamentals and techniques exist that are essential to your growth as a budding 3D animator. They may be covered here in the future, but why take a chance? Send your comments, suggestions and protests to me in care of this magazine. Questions and tips are also nervously encouraged.



Special thanks to Ron Thornton and John Teska for contributions to this article.

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Send for Back Issues of Video Toaster User

January 1994

seaQuest animators reveal the secrets of creating an underwater scene; Learn about choosing the right lens in "Looking Through the Looking Glass;" and a review of the Prime Image Y/C++ transcoding TBC.

October/November 1993

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

August/September 1993

Contains a review of the Toaster 4000; a look at LightWave 3.0's skeletal deformation feature; and the first of two interviews with the fathers of the Toaster, Tim Jenison and Paul Montgomery.

June/July 1993

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

April/May 1993

Presents a tutorial on how to survive as a freelance videographer; a review of Sony's CCD-VX3 3-Chip Camera; plus, a walk through One-Stop Music Shop.

February/March 1993

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

Other VTU issues currently available:

December/January 1992; October/November 1992;
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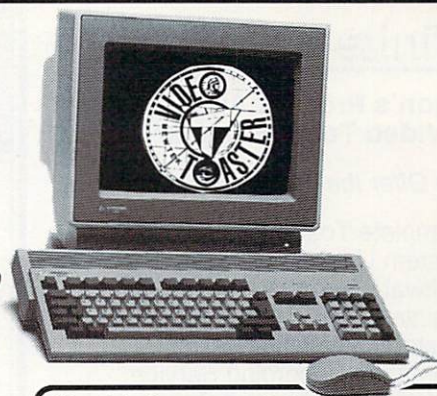
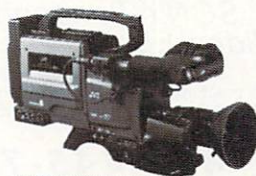
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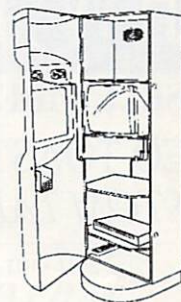
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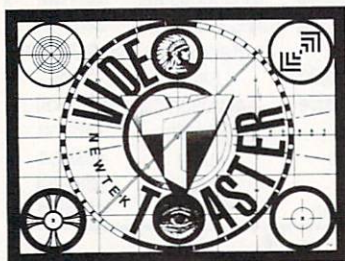
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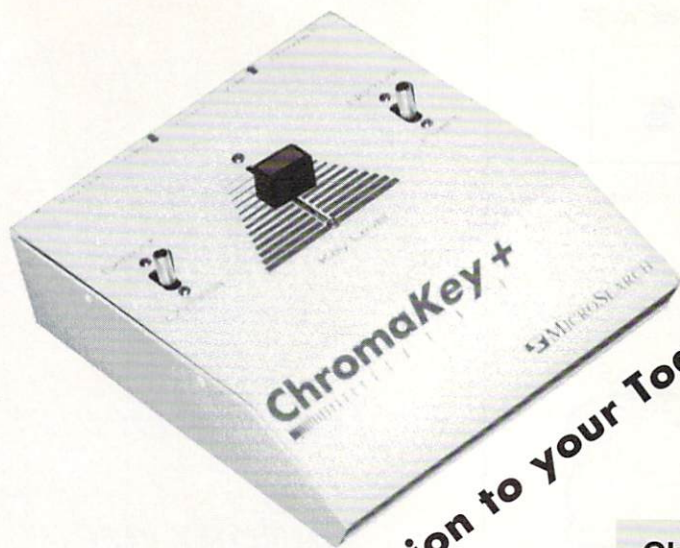
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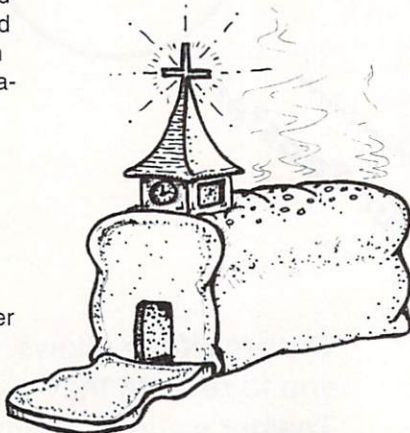
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2D Cel Continued From Page 111

program manual could save you ten-fold that when creating animations).

If you plan to create character animations, go to the library and check out a good book that covers topics such as squash, stretch and line of action. As mentioned earlier, animation techniques haven't changed a whole lot over the years and a good animation book is a timeless reference.

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Maury McCoy was the original designer of objects included with LightWave 3D. He currently specializes in 3D and cel animation at Snitily Video Productions in Lincoln, Neb.

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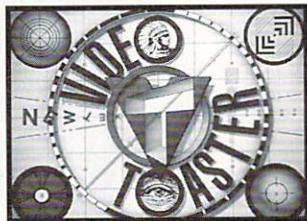
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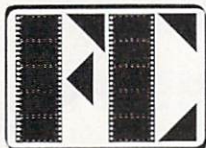
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The Amiga Video Graphic Society

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 in July and August.

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and third Thursday of the
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Time Share Studios,
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7:30 p.m.

Fine Art Productions User Group Society Network

Richie Suraci
Fine Art Production
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Newburgh, NY 12550
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MicroWave User Group

Art Baldwin
3670 Delaware Ave.
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(716) 873-1856
BBS: (716) 873-9262
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of the month
7-9:00 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
Tim Ryan
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 Communications
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

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Jacksonville, FL 32207
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9600 V.42.bis
6p-9a M-TH, 6p,F-9a,M
Meets on BBS
(904) 396-0318

Midwest

Channel Z Toaster User Forum

Brian Plante
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Evanston, IL 60202
(708) 332-1710

Discover-Ring Video Toaster

Ring Software
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Digital Arts Toaster User Forum

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Toast of Tulsa

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Tulsa, OK 74169

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Inland Empire Toaster Users

Neil Abeynayake
1033 Pacific St.
San Bernardino, CA 92404
(909) 885-5259
Meets on the first Thursday
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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
1-5:00 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
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6:30 p.m.

Sacramento Video Toaster Society

Glen Cornish
Applied Computer Systems
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North Highlands, CA 95660
(916) 692-0520
(916) 338-2000
BBS: (916) 338-2543
Meets on the third
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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
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HT Electronics, 275 N.
Mathilda Ave., Sunnyvale, CA
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Amiga LightWave User Group

MG Software & Video
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N.A.G. Desktop Video SIG

Scott Wehba
Infinite Solutions
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Beaverton, OR 97007
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Meets on the fourth
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Amiga Video Association, Inc.

Forrest McKinney
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Dallas, TX 75355-0248
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Professional Video Toaster Forum

Omni International Trading
Monte Strohl
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Seattle, WA 98109
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Fax (206) 628-4324
Meets on the second
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T.U.G. 98XXX

Larry Simpson
Amiga Northwest Studio
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Meets on the third Thursday
of the last month of the
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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
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Burnaby, B.C. V5C 6C6
Canada
(604) 298-9866
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Toaster Professional Forum

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Video Toaster User Group

Jean-Francois Boisclair
Maison du Logiciel
Softwarehouse
2466 Jean-Talon Est,
Montreal, Quebec H2E 1W2
Canada
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Fax (514) 722-0627
Meets on the last Monday
and Tuesday of the month
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Far East

OvenRange

Katutoshi Takahashi
201 Sundecar
1-21-9 Kouenji-Kita
Suginami-Ku Tokyo 166
Japan
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81-3-3733-9816

LAST WORD

Toaster 3.0 and 4000

What Are Your Upgrade Options?

By Lee Stranahan



It's been months since NewTek released the Toaster 4000 and the corresponding upgrade program. So why are most people I talk to so confused about the upgrade? I've talked to a number of people who haven't upgraded yet, just because they don't understand what the real options are.

The upgrade information NewTek sent out didn't help much. There's a right way to explain a complex upgrade like this and that's by laying out the options in order. Let me give it a shot here and see if it becomes clearer.

There are three basic options for upgrading:

1) 3.0 software only; 2) 3.0 software plus the new Toaster card; and 3) new software, new card, and new computer, namely the Amiga 4000.

Options 1 and 2 are referred to as System 3.0; option 3 is the Toaster 4000—the difference being the computer you run it in. Options 1 and 2 are upgrades, whereas

Instead, they sent out what amounted to a Toaster 4000 sales kit, and mentioned 3.0 mostly as an afterthought. By over hyping the 4000 and treating 3.0 like an ugly stepsister, they've made some people suspicious about whether System 3.0 is really Cinderella.

What NewTek needed to do is just lay out the facts and let people make up their own minds. You Toaster users aren't dumb—you just need the right information. The company seems to want to clear things up by re-launching 3.0, and I guess it's better late than never.

NewTek's oversell is too bad in a way, because all other things being equal, the Toaster 4000 is clearly the best system. The effects look better, the interface is better looking, and the new hardware has some advantages over the old hardware. To top it off, it costs less. NewTek did a good job on Toaster 4000, but the card and the software don't make a complete system—you still need an Amiga 4000. That's where the real problems start, and they aren't NewTek's fault at all.

The Amiga 4000 is a very mixed blessing. The good part of the Amiga 4000 is the AGA chip set. Those new graphics chips make it possible to do the good-looking animation playback and cool new effects. Unfortunately, there are a lot of bad parts.

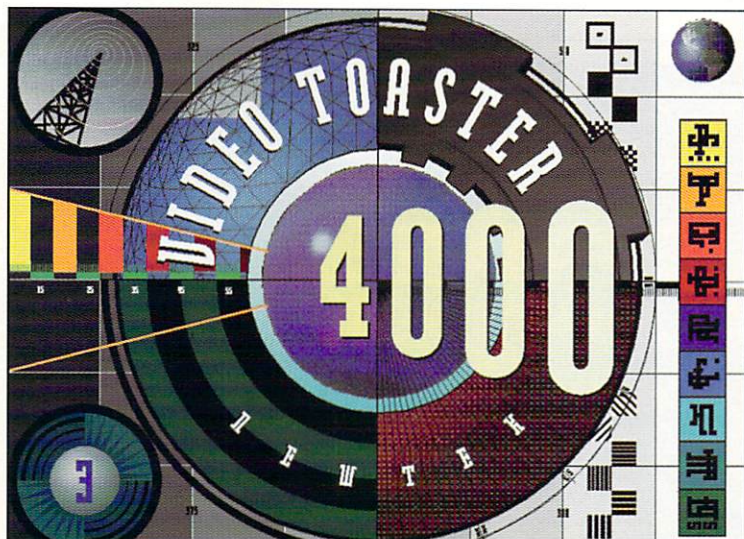
First off, the box is too small. After you put a Toaster in, you only have two slots left. There are third-party slot boxes, but they cost money and take up more room. The 2000, on the other hand, is a tank. It has a bunch of slots and a big enough power supply to drive them.

Second, it's slow. My Amiga 2000 with a Great Valley Products '040 board is twice as fast as my '040 Amiga 4000. Yes, twice as fast. If you use LightWave, this is a *big* deal. Render time is money, after all. There are accelerators coming out for the 4000, which means you can spend more money. Which brings up point three.

The 4000 is overpriced. As of this writing, it has a street price of \$2,400. If you can find a dealer with a 2000 or 3000, you'd probably spend about \$600 for a 2000 or \$800 for a 3000. Add an '040 and a 200MB hard drive and you'd spend maybe \$1,800 total, and don't forget, you'd be twice as fast as a 4000 and have more storage space.

Plus, there's a whole other world out there and that's where the 4000 really looks bad. I can go out today and buy an '040-based Macintosh or 66MHz 486 system, complete with a color monitor, large hard drive, fax/modem and bundled software for under \$2,000. Aside from video production, why on earth would anybody consider buying an Amiga at this point? The PC is even a better game machine now, for gosh sakes.

(I can already hear the sound of the Amiga zealots pulling out their pens to write VTU and call for my public lynching as a heretic. Now I know these Amiga-or-die



option 3 really involves buying a whole new system, albeit with some deep discounts. Without getting into a lot of specifics, System 3.0 can do everything a Toaster 4000 system can except real-time animation playback, and 3.0 lacks the 4000's many and better effects.

In other words, the CG is the same, LightWave is the same, Modeler is the same, and much of the Switcher and many new effects are the same. There are a few minor differences (such as yellow buttons instead of white ones), but the major differences are the animation playback and the new effects. This isn't to discount those features, however—for many users they are important.

What I think NewTek should have done is explain all of this and outline the differences clearly and in detail.

LAST WORD

users are only a tiny fraction of Toaster users, but they like giving people like me grief. So as a preemptive strike, let me respond to this small minority of kooks by quoting William Shatner, "Do any of you people have lives?" Try leaving your apartment in your parent's basement and go to a CompUSA, CostCo or Circuit City. Look at computers you can buy there. Look at the shelves filled with software. The Amiga is dead as a general-purpose computer—deal with it.)

As a video computer, however, it still rules the day. Just take a look at the Toaster or even something like Digital Processing Systems' Personal Animation Recorder. This is a great product, and its quality and price point make Quicktime-using Mac owners cry out loud. Even the 4000's animation playback blows away many video products on the Mac or PC.

So what should you do? Well, if you don't own a Toaster and are buying a new system, about your only choice is a 4000. Should you look at used equipment? Well, it sure doesn't hurt to look, but it's important to remember that you're buying into yesterday's technology. However, that still

is a very powerful technology, and you might be able to get a killer deal.

Upgrading is another story. If you're made of money, do the double and buy a 4000. Having both systems in your studio is a great way to go. Equip the 2000 with an '040, and a big hard drive and make it your graphics machine or part of an off-line system. The 4000 (with its cooler effects) will act as a part of your main edit suite. Add a couple of Ethernet cards and software like Enlan DFS, and you can transfer files between the two quickly and easily.

Most of us have to count pennies very carefully, though, and that makes it a tougher call. If you have a lot invested in your current Toaster system, it's awfully hard to bite the bullet and do the upgrade to the 4000. Also there are a lot of users who simply can't sell their systems because they work for the government or other fun bureaucracy.

If your main purpose is LightWave, the 4000 just doesn't make that much sense. For the money you'd spend on a 4000 and a new accelerator to make it as fast as a 2000 with an '040, you could

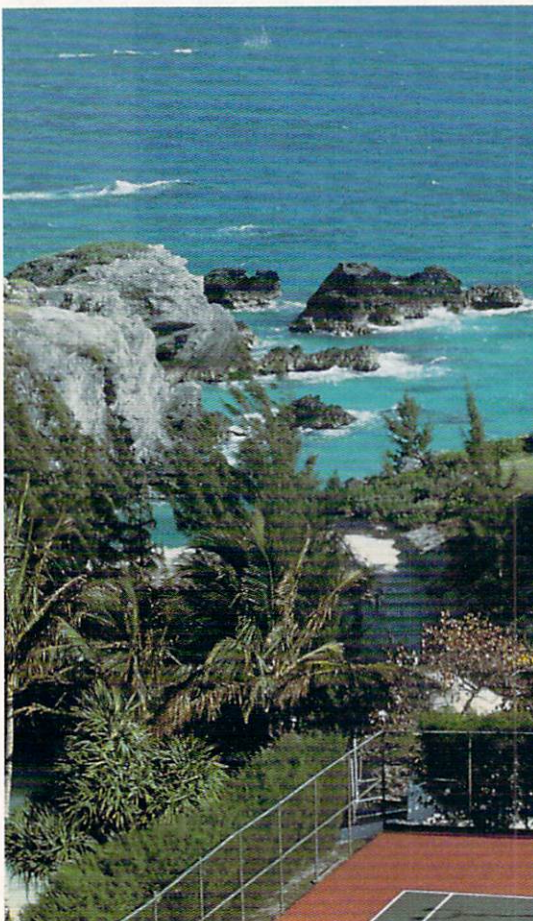
buy a Personal Animation Recorder and have better-quality playback (and more flexibility) than a 4000 alone.

Should you get the new board? Well, there aren't many benefits to using the new board in a 2000 today. One obvious benefit is that you have a choice in the future if you decide to swap computers. The genlock is also better, but most people don't use that function that much. If there are other benefits, NewTek should let us know about them.

In fact, we'd all be better off if NewTek fessed up on a few issues. Will they continue to support the old card with new software upgrades? This is important for us regular users, and the only people with the answers are in Topeka. In the future, I'm sure that everybody would appreciate a little more information to go on. We're not dumb, after all.

VTU

Lee Stranahan, "the World's Smartest Toaster Guy," is currently touring the country with VTU's Toaster Training seminars. He is the author of 101 Toaster Tricks and the host of the successful Desktop Images series of Toaster Training videotapes.



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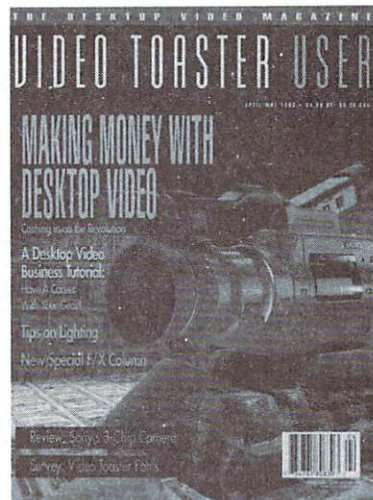
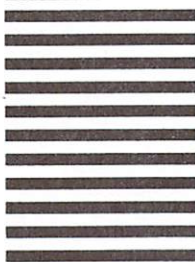
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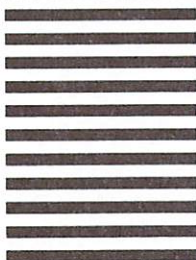
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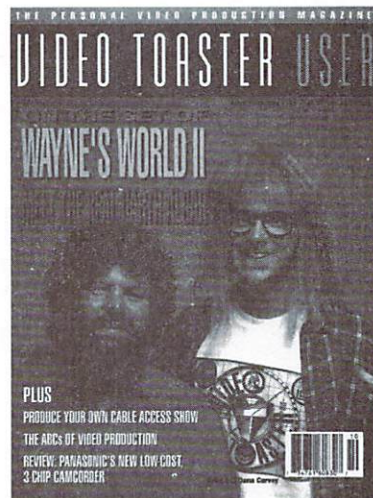
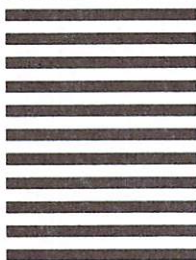
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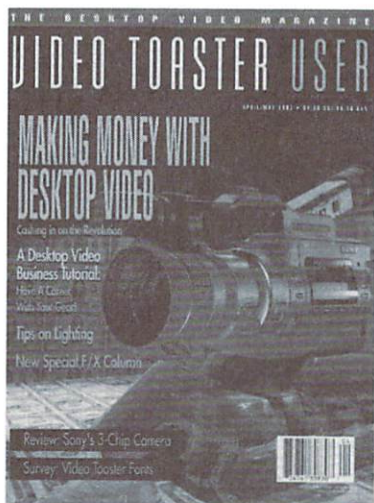
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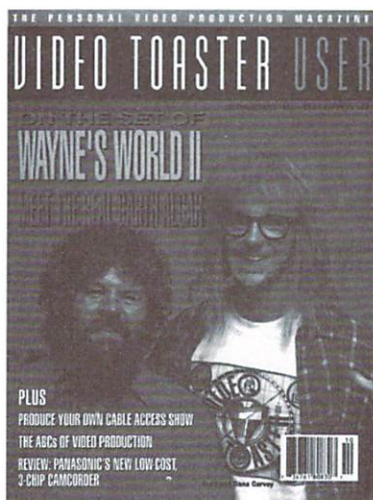


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4	19	34	49	64	79	94	109	124	139	154	169	184	199
5	20	35	50	65	80	95	110	125	140	155	170	185	200
6	21	36	51	66	81	96	111	126	141	156	171	186	201
7	22	37	52	67	82	97	112	127	142	157	172	187	202
8	23	38	53	68	83	98	113	128	143	158	173	188	203
9	24	39	54	69	84	99	114	129	144	159	174	189	204
10	25	40	55	70	85	100	115	130	145	160	175	190	205
11	26	41	56	71	86	101	116	131	146	161	176	191	206
12	27	42	57	72	87	102	117	132	147	162	177	192	207
13	28	43	58	73	88	103	118	133	148	163	178	193	208
14	29	44	59	74	89	104	119	134	149	164	179	194	209
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8	23	38	53	68	83	98	113	128	143	158	173	188	203
9	24	39	54	69	84	99	114	129	144	159	174	189	204
10	25	40	55	70	85	100	115	130	145	160	175	190	205
11	26	41	56	71	86	101	116	131	146	161	176	191	206
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13	28	43	58	73	88	103	118	133	148	163	178	193	208
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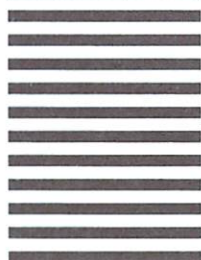
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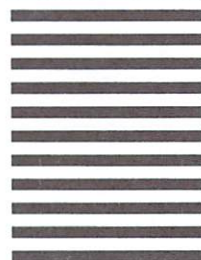
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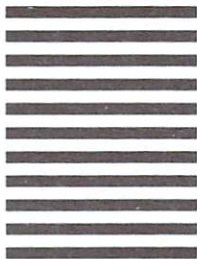
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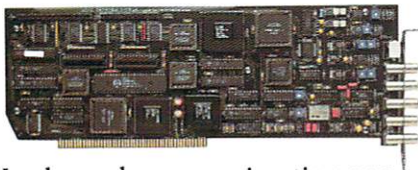
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